2023

ENERGY USER NEEDS STUDY

The Case of Rwandan Rural Households and Businesses

EXPERIENCES, NEEDS AND ASPIRATIONS

PREPARED FOR FAM STUDIOS BY KWAME NORVIXOXO

Research
Scope & Method

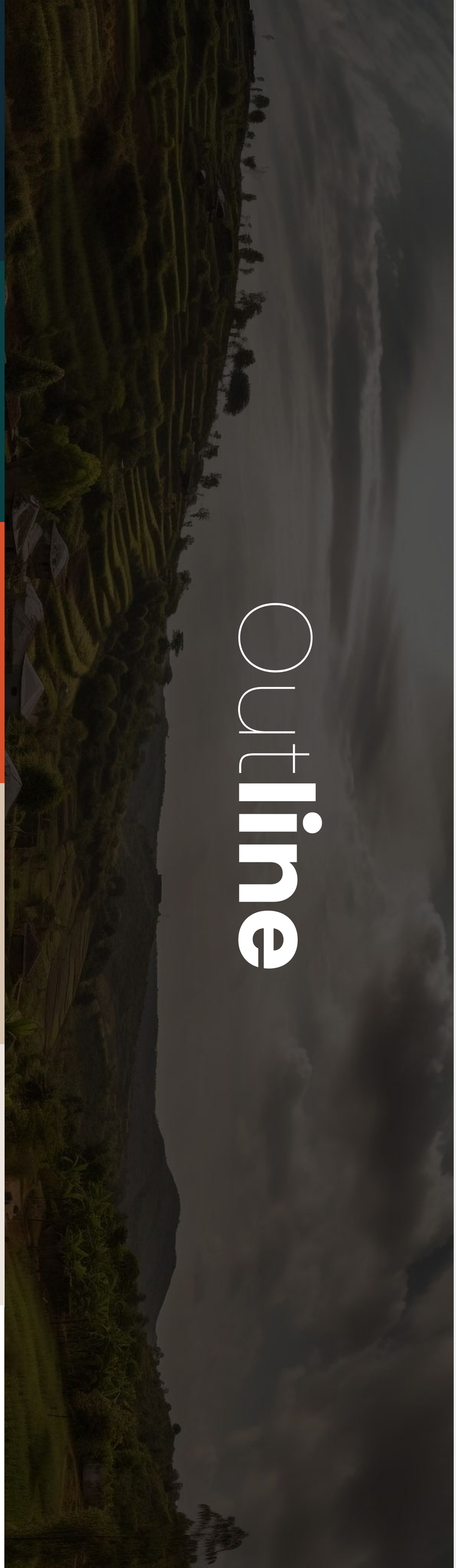
Background

Results
Key informant/
in-depth Interviews

Survey **Results**

Key **Findings** &
Recommendations

Appendice & Extra
Information



Outline

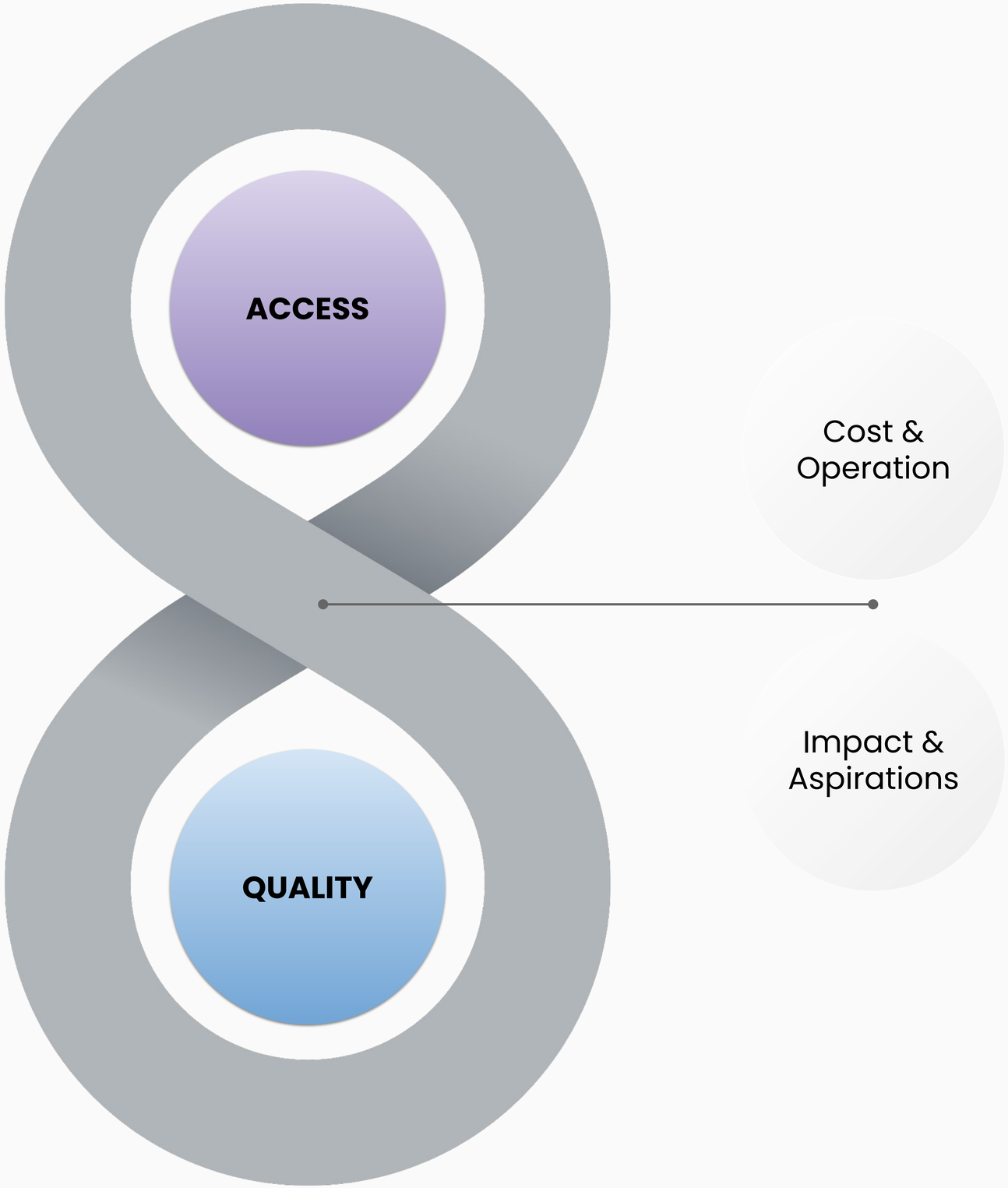
introduction

project scope and methodology

scope

1. Level of awareness of different SHS and communication channels
2. Electricity usage and needs
3. Financing models, needs and options, outside PAYG
4. Current issues with SHS usage
5. Existing systems of use, distribution and knowledge
6. Existing repair and circulatory systems, what happens when things don’t work?
7. Purchasing decision making factors to consider

1. Community support systems and community role in influencing decisions
2. Families dreams for future and children’s education
3. Business ownership, differing and complementary needs to home?
4. Role of women, areas of empowerment through electrification?
5. Technology access and literacy, smartphones, feature phones etc.



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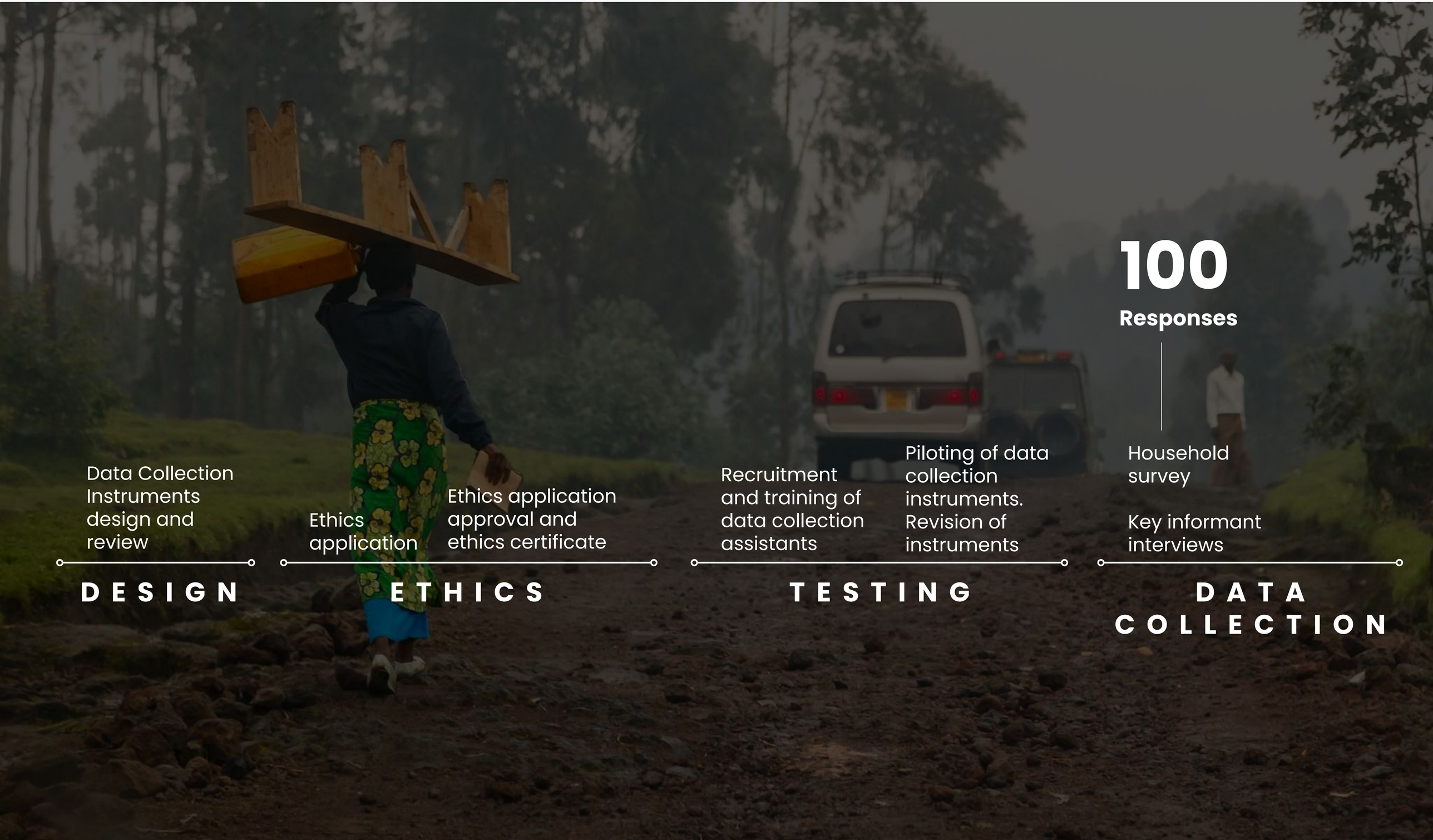
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Responses
Data Collection Instruments design and review
DESIGN
Ethics application
Ethics application approval and ethics certificate
ETHICS
Recruitment and training of data collection assistants
Piloting of data collection instruments. Revision of instruments
TESTING
Household survey
Key informant interviews
DATA COLLECTION

Households
Businesses

Women, Men,
Children

No solar or
national grid
connection

Solar ONLY

National grid
connection
ONLY

study **participants**

data collection process

Community gathering and one on one interviews [redacted]

national perspective

background

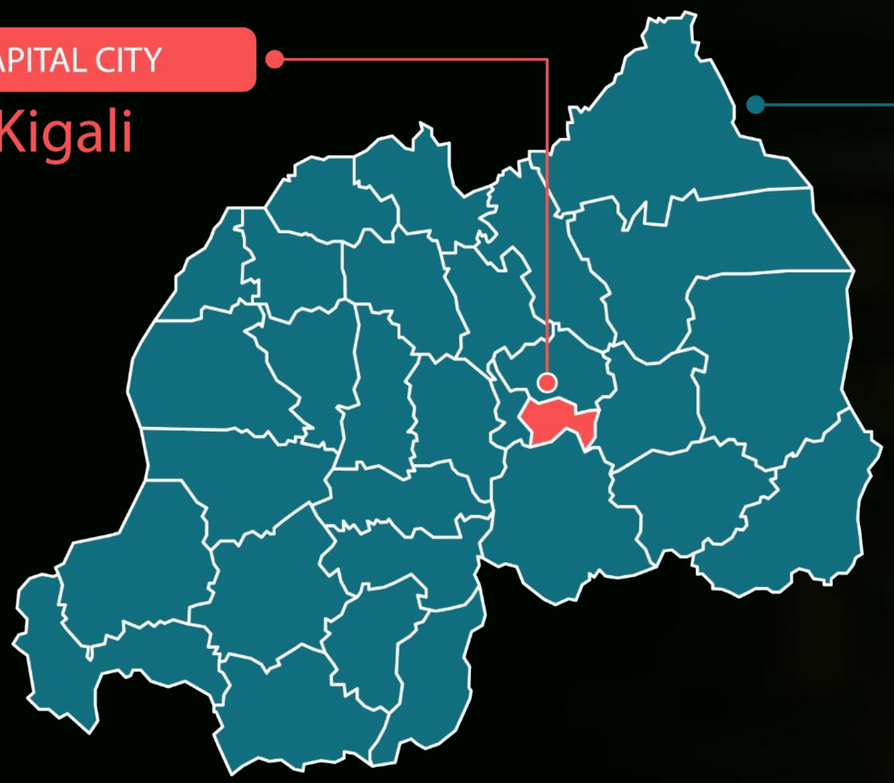
background

Rwanda has built a reputation as a **leading reformer in Sub-Saharan Africa** for social, economic and political reasons. However, **it remains one of the least developed countries** and still requires significant infrastructure financing for socioeconomic activities. In the Doing Business indicators, **Rwanda has been at the forefront among African economies, moving from a global rank of 148 in 2008 to 38 in 2020, second in Sub-Saharan Africa after Mauritius** (World Bank, 2020). Although Rwanda's annual gross domestic product (GDP) growth has averaged 7.2% in the last decade, **Rwanda remains one of the poorest countries in the world**.

The country is divided into **4 Provinces** and the City of Kigali. The Provinces are also further divided into **30 districts**. Moreover, the districts are further divided into **416 Sectors**. Additionally, the sectors are further divided into **2148 cell**s and lastly, these cells are divided into **14837 villages**.

CAPITAL CITY

Kigali



TOTAL AREA

26,338 km^2

CURRENCY

Rwandan franc

POPULATION

12,374,000

LANGUAGE

Kinyarwanda

background cont...

Poverty has reduced considerably in the last 20 years in Rwanda, although not in all parts of the country. **In rural areas, poverty remains high;** access to public services such as electricity still needs to be improved. From 2001 to 2017 **poverty reduced from 77.2% to 55.5%, and by the national poverty line from 58.9% to 38.2%** (NST1, 2017–2024).

Access to electricity by private households in Rwanda currently amounts to 61% (47% ongrid and **14% solar panels**). In 2012 census the percentage of private households using electricity for lighting was less than 18%.

The City of Kigali is ahead with 90% access to electricity, while in the other provinces, access to electricity ranges between 55% to 60% of their private households.

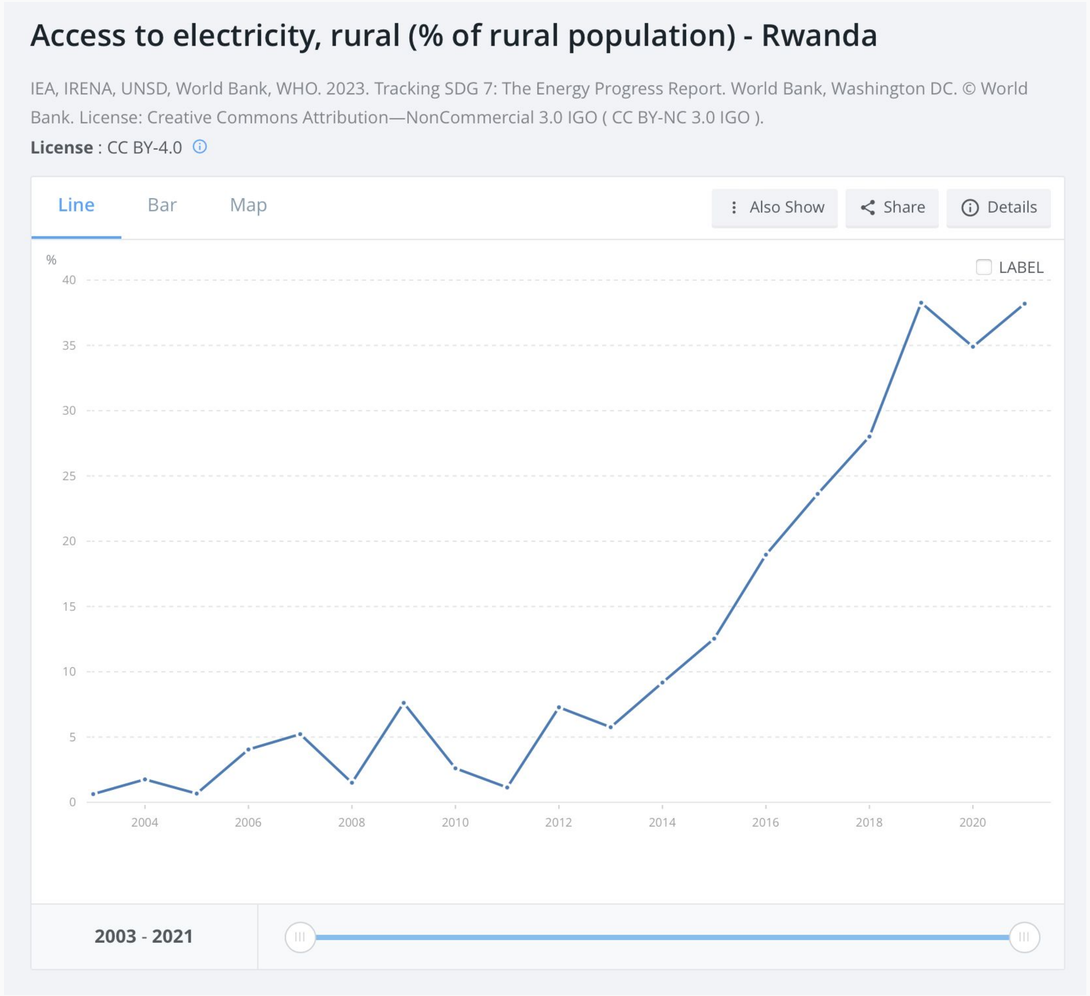
Access to electricity by households is far higher in urban areas (84.6%) than in rural areas (51.3%).

At national level, majority of private households in Rwanda (76%) use firewood as their main source of energy for cooking. This observation prevails mainly in rural areas (93% of private households), whereas in urban areas the main sources of energy used for cooking are charcoal (50%), firewood (34%) and gas (13%).

The main source of energy used for lighting by private households is electricity from REG (47%). Other prevalent sources of energy for lighting are phone flashlight (28%) and solar power (14%).

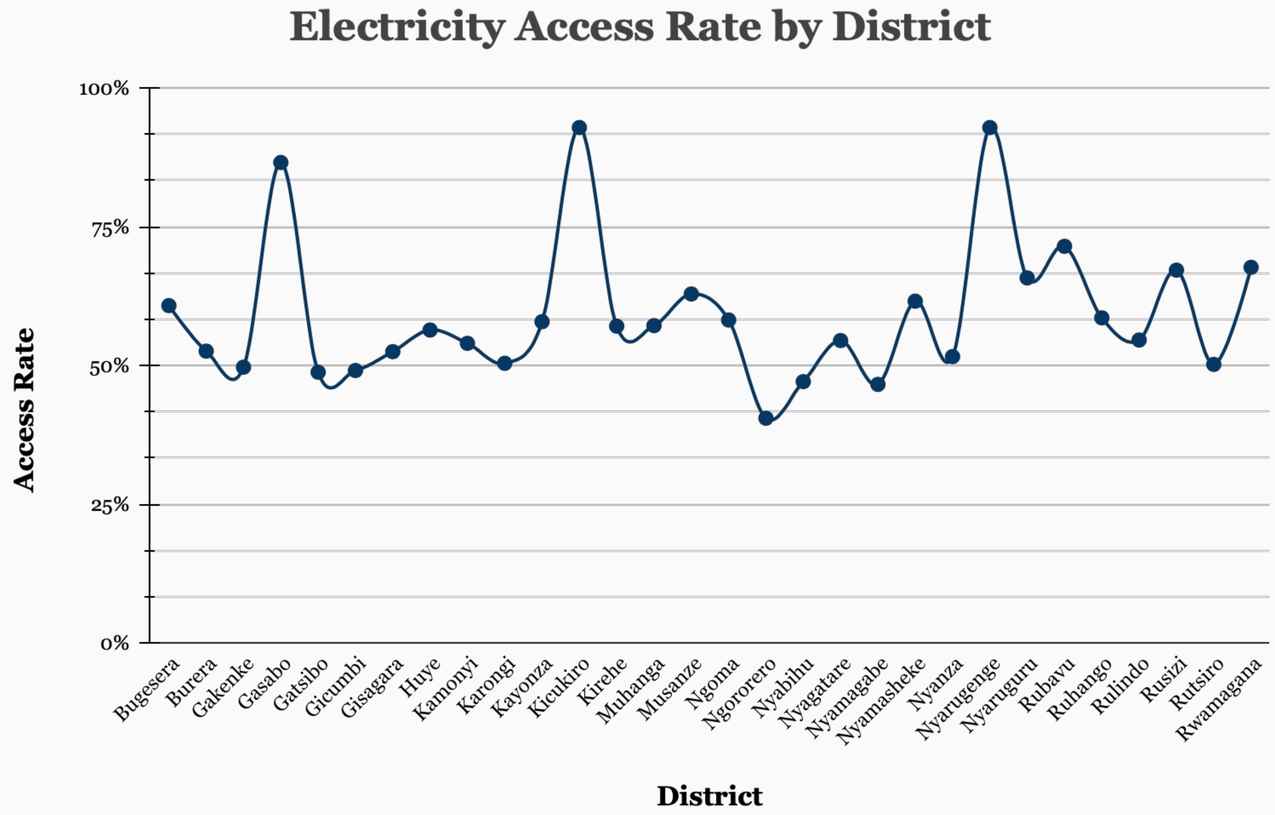
access

There is a high connection between poverty and the lack of access to public services, including electricity. Even though electricity access increased from 9% to 15% within rural households between 2013/14 and 2016/17, it remains far too low for Rwanda's development ambitions.



national access

- On-Grid zone counts for **13,116 villages** (comprised of Grid Extension and fill in connections) among which **961 villages** of all villages will be temporarily supplied using Solar Home Systems (as 2nd priority).
- Off-Grid zone share is **1,641 villages** countrywide of which:
- Standalone Solar Home Systems (SHS) are demarcated in **1,442 villages** and considered as 1st priority for investment in off grid.
- Microgrid technology is demarcated in **199 villages**.



access

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CASE STUDIES

"I decided to install solar system by myself because the previous one from Tubura was inefficient."

"I decided to install the solar home system by myself because the previous one from Tubura was inefficient. It worked only for three hours and would only be used in two main house rooms. For the business, we used torches or candles. Only two lamps worked, and we could not fix any broken system parts because we didn't know how to. I called the providers for help they never came; it was just a mess, and we needed to figure out what to do.

Then I remembered a friend who had a Ugandan friend with a well-functioning solar home system that he installed using a car battery at his home. I contacted this friend, who also got my Ugandan friend for me.

The three of us planned to meet. Before our meeting, the Uganda friend called asking me if I would be interested in buying his solar home system, to which I said yes because he was going to go back to Uganda. I brought it, and it's been working correctly for a year and a half. I need to recharge the battery, which costs me about 2000 Rwf in six months. It works better than the previous one from Tubura and is better than any other SHS in the neighbourhood. It works for my house and business for as long as I want. I can charge my radio, phone and for neighbours".

“

"The lack of electricity here in our village means we can only use other means that provide light – mainly firewood, torches and our small phones sometimes.....

For instance, I want to talk about getting firewood because it saddens most of the village's children, including my daughter. ***She is the only daughter, and it's one of her responsibility to help her mother gather firewood*** *from the brush. Our farm, where they collect firewood, is about* ***4-5 kilometres****, and we walk to get there. After collecting enough, they tie it and carry it for the same distance to the house. My daughter is always tired after every trip, and her ordeal is not over. When she gets home, she washes her clothes (mostly school uniform), fetching water from the stream about a kilometre from our house.*

On the other hand, her mother's ordeal does not end there either. She goes to the kitchen to prepare food and spends about half an hour preparing the fire before cooking; then she cooks, the food gets ready, and then we gather in one room with one torch to eat. We have yet to talk about education. In most cases, ***my daughter does her homework immediately after school. However, it's not always the case, especially when activities such as firewood collection and fetching water – which happens most of the time – must happen. When she finishes all these, she is already tired to the point where she has to sleep. My daughter's experience isn't different from the other school-aged youth in our village.***

In other words, in this village, the best time to learn for most of the children is the daytime; if the day was used to collect firewood or do non-academic work, that means they have lost it. With ***no electricity, they could only learn by using a torch, firewood light, or a lantern, and neither was good, but a beggar had minimal choice, so I had to make do with it.***

Now tell me, would a student be able to excel in class under these conditions? I will tell you many of the children here in the village cannot read in English even after high school, yet it's the language of instruction. Most of them come off as illiterate, yet they went to school.

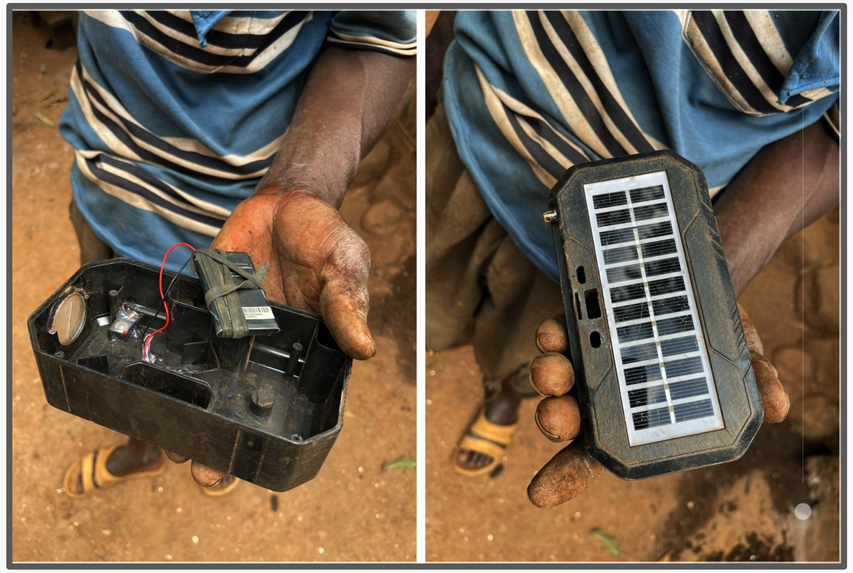
We only struggle with unemployment sometimes. Occupations are minimal, and poverty is in most homes. Thus, most of us are caught in a vicious cycle of poverty. Our lack of access to electricity limits our children to revise at home, later on, do other activities that could improve their lives. And I'm saying this because I see the difference between our children here and those who live in the nearest town where electricity is accessible".

Hakizimana Philippe

During the payment period, the providers would even call reminding of the payment dates and, at some point, ask if there was any challenge - although they never resolved any.

"I have been using this rechargeable torch for the past two years. I had SHS installed in my house, just like many others in the neighbourhood, but it only lasted for a year. The entire system has fallen apart; I lost most of the parts.

It all started when SHS companies came to our village holding solar panels and lamps. They would connect everything in just a few minutes, and the lights would be on. ***They talked about the cost, which was expensive until they presented the idea of paying in instalments.*** *I decided to take it, and* ***it worked, though not smoothly for two years****, which was my payment period. During the payment period, the providers would even call reminding of the payment dates and, at some point, ask if there was any challenge - although they never resolved any.* ***After the payment, they were nowhere to be found, and the entire system stopped working.*** *I then went back to using torches and my small phone for lighting. We would appreciate some form of help."*



Kirigi Kosima.

> *We must do everything quickly before it gets dark...*

"Although my SHS was stolen a few weeks after it was installed, ***at least I was one of the luckiest to get it in my house, thanks to our government and the Nkunganire program****. It worked perfectly for one week, but the two lamps could not function the next week. We returned to zero; we used a torch with small batteries to light the house. The small batteries are expensive, so sometimes we spend nights using firewood. We must do everything quickly before it gets dark.* ***Children can barely revise at home;*** *that's if they do. Because there is only one room with light,* ***we are all forced to gather to eat, read the bible, or talk as a family.*** *In other words, it's hard to do activities at night, yet we are known to have the Solar."*

– Mukaruzibiza Claudine

When Solar was installed, I thought my children would finally revise at home, watching TV and exploring technology, just like other kids in our neighbouring town.

"There is a big difference between what they say about Solar and what it is. I was overjoyed for the first few days after the installation, but there were challenges after a few days or months. When Solar was installed, I thought my children would finally revise at home, watching TV and exploring technology, just like other kids in our neighbouring town. However, not only do all become fairytales, we can barely charge our phones and, later on, light all the house's lamps. ***The longest our Solar functions are 4-5 hours,*** *and that's when we did not use it during the day. In the rainy season, we barely use it because it has no battery. And by another way, I still use my phone and torch to light up my house. What else can I say? A bit of advocacy would help."*

—Ruzibiza Theogene

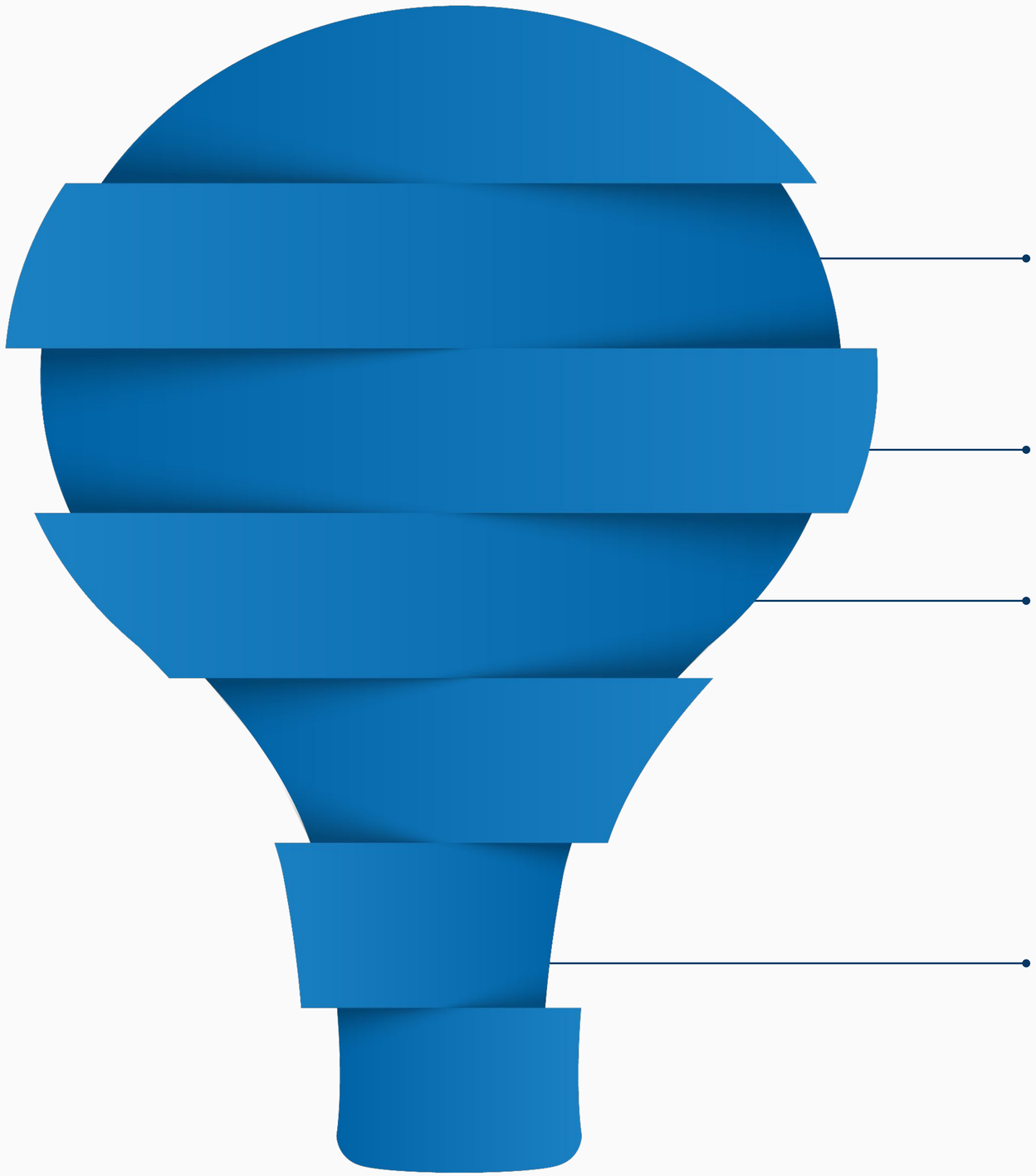
"We would appreciate any difference. If it's Solar, let it come with at least a battery that can store power during the rainy season or at night. ***We would appreciate more than three lamps because some of us have houses with more than three rooms. Also, we would be happy to learn how to fix parts of the SHS if there are no technicians.*** *Or else let's have access to the national grid electricity. There are so many activities we could want to do. Still, we are limited by the lack of electricity in our area, including starting barber shops, buying milling machines, modern carpentry, and sewing. And perhaps, school performance for our children would go higher."*

— Uwamariya Stephanie

Key **Findings** & Recommendations

Visited Provinces fall in Four Categories:

Most of the population in these rural areas have used/use some forms of SHS from the government support (***Nkunganire*** program) or private companies such as **Mobisal, BBOX and One Acre Fund**. Also, note that some communities are entirely off-grid (there are no signs of the national grid in the area). An explanation from authorities is that ***the site is not demarcated as residential.*** The national grid and infrastructure in general (schools, hospital) only reach residential areas indicated on the master plan. The people are encouraged to move.



Those who never received any SHS rely on **kerosene lamps, phone lights, candles and battery-powered torches**. They said that some of these come with health issue.

Most of them are farmers and **earn between 5000-10000 Rwf a month.** This money is gained by cultivating other people's farms and comes as a wage.

Most of the **people without any SHS are those that recently moved to these areas (Mwurire or Gikingo);** thus, they need to be registered as a site resident, and t**heir social class categories did not qualify for the SHS.**

Some of them did not bother because they considered SHS expensive, while others needed more information on acquiring one.

Some respondents also **perceived** the SHS to be inefficient based on the experience of their neighbours who had had the SHS.

There are **barely any activities especially at night** due to the lack of lighting options. **At 6:30 or 7 pm, everyone is in the house.**

They claim to have **limited information regarding policies, ongoing events and other social-related information due to the lack of electricity** to power mass media tools (radio or TV).

Households wish for their children to continue school but need more means (**the closest school facility is 5km away** and **there are no lights to revise after school), leading to poor academic performance.**

They mostly **use neighbours' SHS or travel to the nearest town to charge their phones and torches.**

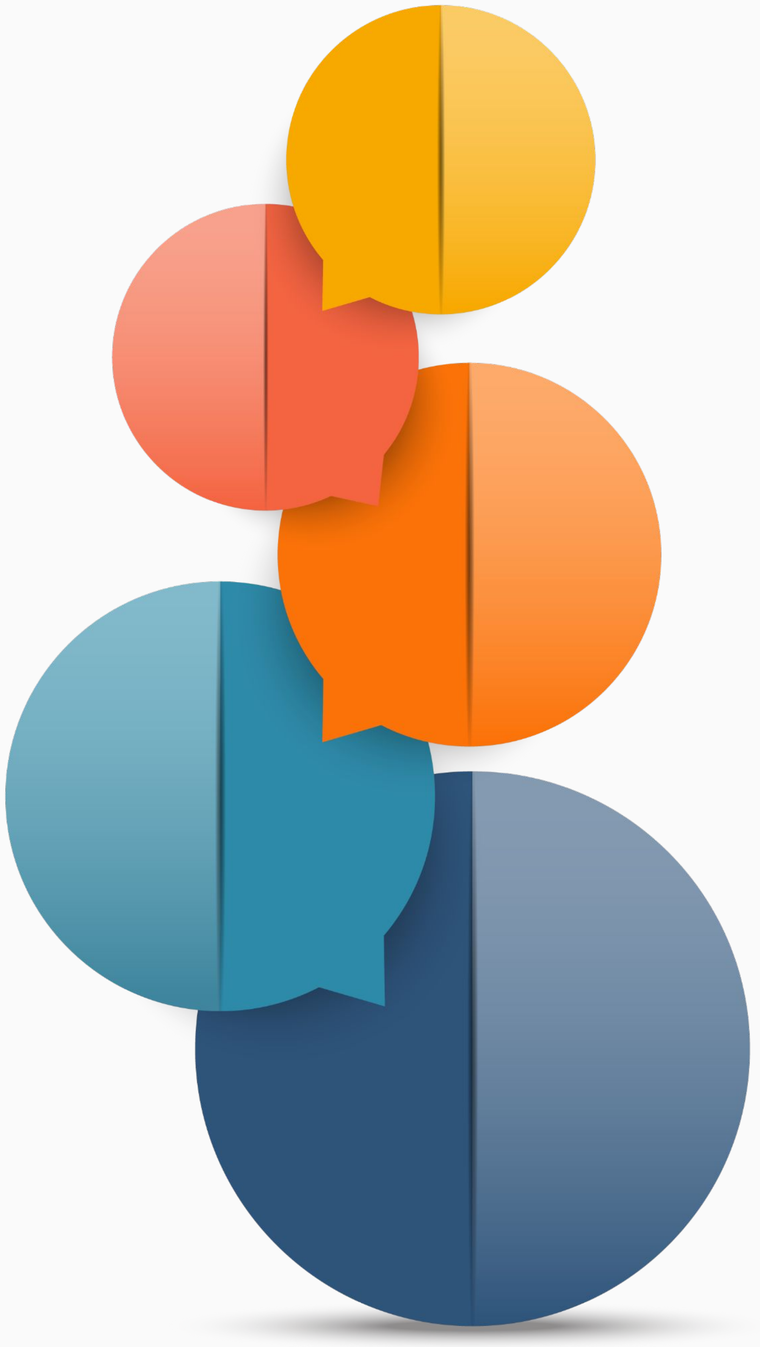
> ***lights were on for no more than 2 hours; the SHS had no power storage unit; only received technical support from providers when still paying, and it stopped soon as they finished paying....***

SHS can be under instalments or a one-time-discounted fee from the private providers. When payment is not made on time, the SHS does not function.

Most of the households who bought from private providers complained about the functionality: **lights were on for no more than 2 hours; the SHS had no power storage unit; only received technical support from providers when still paying, and it stopped soon as they finished paying.**

Those who received **SHS for free complained about insufficient capacity (The lights went on for a short period (2-3hs)**. Further, they complained about payment. Payment for the S.H.S. can be under instalments or a one-time-discounted fee from the private providers. When payment is not made on time, the SHS does not function.

Maintenance was a recurring issue as most recipients were in the first class of the social category. Those in the second category had to pay some amount (usually 5000 Rwf), which means they could acquire the SHS.



Households must **cook early and do other activities when the lights remain**. This and other instances explain why only some users rely entirely on the SHS. They have other sources of energy, such as torches and rechargeable lamps;

Children are also forced to study while the lights are still on;

They have to **convene in the one room with lights at night**.

In principle, some SHS provided by private companies come with a **warranty period**: Households could access a replacement in this period if the issues were not self-induced. ***A majority would beg to differ.***

There needs to be more than three light bulbs that SHSs supports. The maximum lights received are three, and they seem insufficient for someone with a house of more than three rooms. Users complain they are forced to sit in one or two areas with the light bulb. Also, **SHS can only support a few functions, i.e., charging small phones and powering solar bulbs and radios. Beyond that, nothing else.**

Usage of SHS, in general, is mainly for charging phones, lights and radios.

3.

The Self-installed source of Energy (primarily small business owners)

They initially tried the other options (of SHS) from private providers and the government, but it did not work. **It was either the lights were on for a short time or from time to time it was broken, and they had no idea how maintain it.**

They then decided to install their own SHS (purchased the solar panel, car battery, and light bulbs and then hired a local technician).

Have but **Stolen**

A good number of recipients of the **SHS under government support complained about the issue of theft** in their community, particularly in Mwurire (Eastern province). **Some of the SHS parts were stolen in less than a month**.

There was a **lack of security** and an **inability to track** the stolen SHS.

No replacements were provided for the stolen SHS

Once stolen, the households went back to using kerosene lamps and torches

businesses

These are primarily small business owners who generally need electrical energy for their business and their children learning at home and power appliances such as mobile phones and radios. This does not mean that the power was now sufficient, but it was better in terms of performance compared to SHS provided by the government and private providers. **They are usually connected to the main grid by renting from neighboring houses.**




...with the presence of electricity, a lot can be achieved, mainly with my job. For instance, I would be able to work more than two times a week. My kids would perform higher or better if the circumstances were more favourable.

"I work as a mechanic in the Rubona sector. Tuesday and Friday are the days I work. I commute four kilometres on foot to work at the local (small) market. I fix everything from phones to chargers to radios. Using my extension cord, I borrow electricity from a neighbour who lives close to the local market because I don't have any access to either solar panels or the national grid. I pay 500 rwf for the electricity (twice a week).

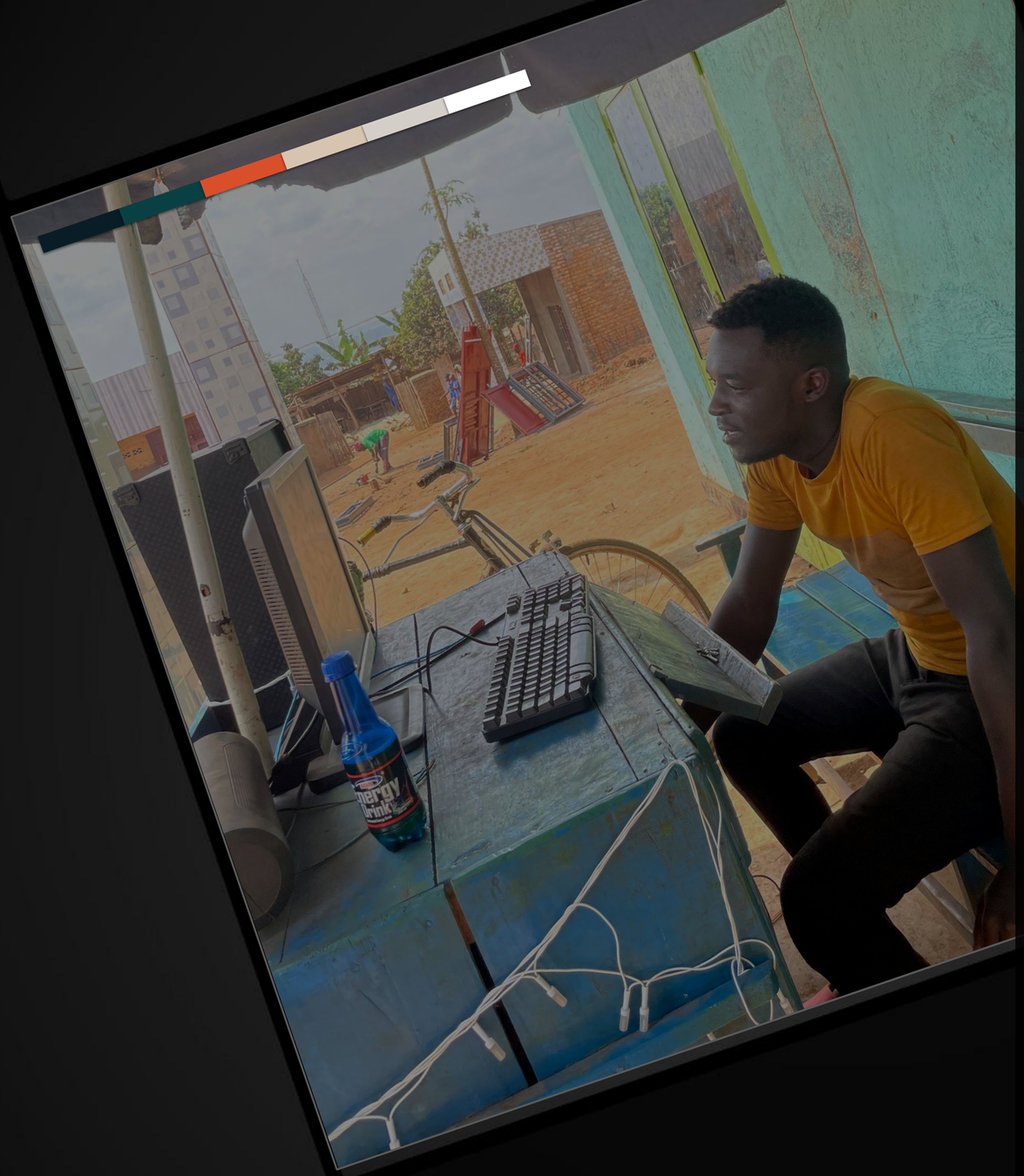
***At home, we use rechargeable lamps, one torch, and my small phone for the kids to study or do their homework and around the house– although it's insufficient, and the kids do not do this regularly**. In most cases, we use firewood for light at home, and the kids would sit around it sometimes to be able to finish their homework.*

I wish the government could also remember us because, with the presence of electricity, a lot can be achieved, mainly with my job. For instance, I would be able to work more than two times a week. My kids would perform higher or better if the circumstances were more favourable.

"

"I fix everything from phones to chargers to radios. Using my extension cord, I borrow electricity from a neighbour who lives close to the local market..."

*_Ubunani Protais_*



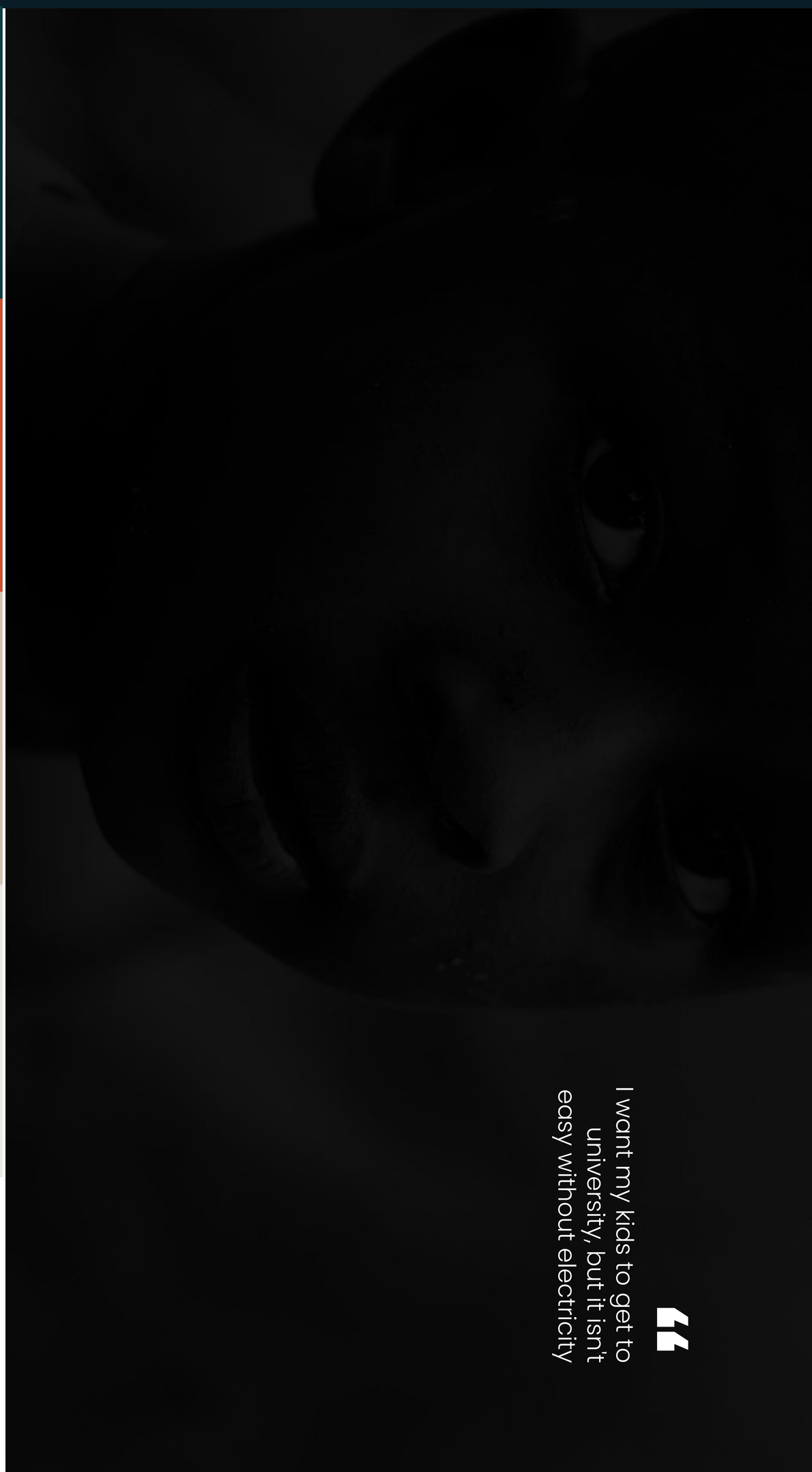
I was born and raised in Rubona. When I completed high school, I couldn't get a job– even though I had acquired some computer skills from school. I had seen people in Kigali selling music and movies through similar laptops to the ones we used at school. So I thought, why not do the same, since the people connected to the national grid in my neighbourhood had television? Today I make money, even though it's not much, that helps me with my daily expenditures. I get to buy my clothes, I can relocate to another place quickly, and I hope to be able to attend university one day.

We don't have access to electricity at home, so I keep all the equipment in a rental storage unit. ***Had we had access to electricity, I would probably be able to expand my knowledge more on what I do, like maybe be a deejay.***

*_Nshimiyimana Augustin_*

FISH FARM RUNNING ON SOLAR

Aspirations for the education of children and personal skills development...



Shared Sentiments/ Aspirations

All Households wish to have a functioning SHS with enough power capacity; power storage capacity, especially during the rainy season and at night.

They generally want to work for longer hours which can boost their productivity in the community. Longer-lasting lighting options can bring this about.

They all want to see their children able to study anytime they want and access more information using technology. Children have to understand everything before leaving school or be compelled to wake up early in the morning to revise before the start of classes.

Access to functioning electricity would boost economic activities. Other economic activities would include carpentry, welding, sewing clothes and refrigerators for cold storage.

Aspirations

I want them to study and finish all levels. But it's tough, and I walk a very long distance. Myself, **I would like to learn how to use a computer. I see people make money.**

I want the best for my children. They seem not to like school, but I will push them. **They always complain about the distance, but I will help them finish. I'm sure they will be great people.** The personal skills I want to develop will help my house's development, including sewing.

To this point, I have no aspirations. Children can’t revise or follow up with school work after school, which leads to their poor performance. They might not finish school.

Children are constrained from studying in the evening as there is no light in the house. I'm concerned about their education. I hope the government will do something. If not, I will have to find a way.

I want my kids to get to university, but it isn't easy without electricity and a way to revise and study at any point. I would want them to finish at least O level, but **their performance is not good, and we don't have lights to revise.**
I wish they can be big people and I know God will make away.

Only one child study. Others dropped out and now they are in Kigali trying to make money

I want the best for my kids. I want them to study and reach far. But it's hard when they cannot even revise at night because we don't have light. **I don't really care about myself. I just want my kids to study.**

I want the best for my children.

Education: "For instance, **my firstborn has exceeded the 3rd class in school because he revises every night before bed. It wouldn't have been possible if we didn’t have electricity.** For the last few days, he has been spending even more time because he is preparing for his primary national exam.

Sometimes, he comes with a few of his classmates from the neighbouring village for two main reasons: 1) because he is either struggling with a particular subject and the classmate can help; 2) **because the classmates (or their parents) ask if they can revise here (at my house) because they don't have any form of electricity** or they are experiencing an outage for those who have electricity from REG. **I haven't experienced any outage in a long time because it’s either REG or my SHS.**

Others can be doctors, businessmen and women, lawyers or anything.

I aspire for my kids to be rich and happy with their lives. I don't want them to live in this neighborhood. **I want them to go to Kigali and be civilized.** For me I'm getting old. **The only thing I want is the best for my children and probably learn how to make doors**

The same firstborn was third at the district level in a computer-based competition. **He competed with other kids from wealthy families and those who attended good schools. He is the first in our village to get to that level, and it's because of electricity that allows us to let him play with our phones,** sometimes with a desktop, that he can make it to that position.

My son, or any other child, can be anything they want. Now that we are talking about my firstborn, **I wish he could be a computer master.** He loves electronics, and in my limited capacity, **I will help him reach there since we have the base – electricity.**

“I want them to study and became powerful people like our leaders here and in Kigali. I want my daughter be like Mushikiwabo”

I want my kids to finish school, knowing they will end in God's name. **For me, I want to learn how to make modern bricks.**

I wish them the best. For me I'm old

Two of my children are in the city (Kigali) doing work. Some are bike riders, and they barely visit. **But I wish they never stopped studying.** They could be doing something different or be among our leaders here and in other communities. As for me, I would **want to start a business selling bananas, but here we don't have customers for bananas because everyone has them.**

I just want the best for my children. There are challenges, of course, such as poor quality revision and performance in class but we hope for the best

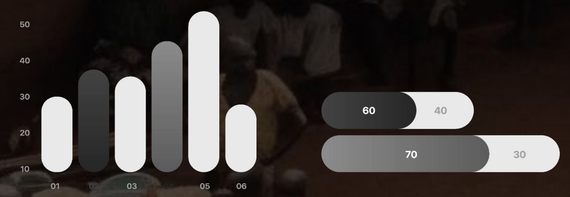
I wish they can be anything they want with God's help.

I want them to be their best, and I will help in my capacity. If it's spending on more lighting, I will do it for my children. I want to learn more about mechanic

I want my children to be ministers once they finish school. If not, I want them to be essential people in communities. That's my wish. I'm too old to think of learning anything new unless I'm supposed to. And even then, I would learn how to make the traditional baskets.

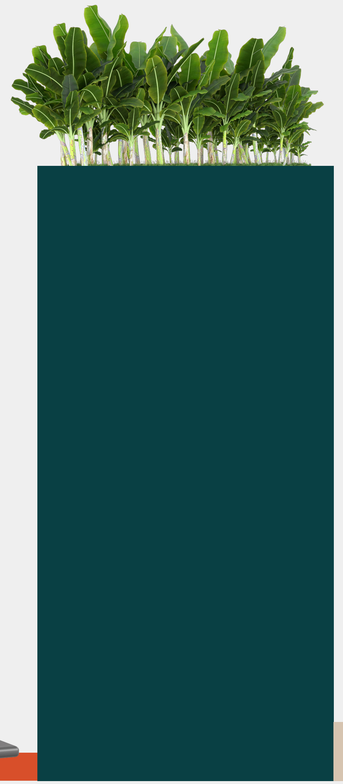
I want the best for them and work hard to see that happening. **Personally, I don't know what I want to learn**

Survey Summary



SUMMARY OF RESULTS OF SURVEY OF 100 RURAL HOUSEHOLDS IN TWO PROVINCES - RESULTS INCLUDE **DEMOGRAPHIC CHARACTERISTICS** OF RESPONDENTS AND THEIR **ENERGY USE EXPERIENCES**

OCCUPATION

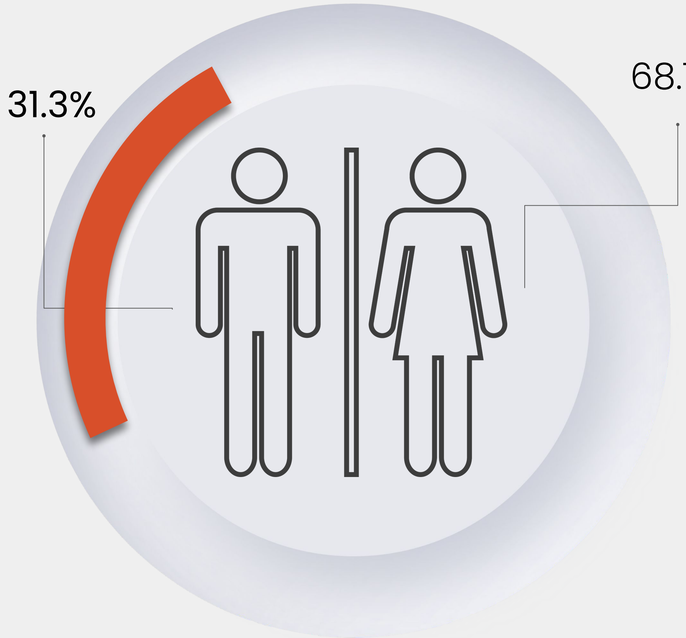


SMALL BUSINESS OWNER | **2%**

AGRICULTURE | **89%**

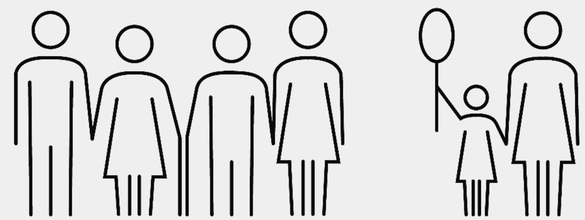
AGRICULTURE & BRICKS MAKING | **6%**

BRICKS MAKING | **2%**



GENDER

HOUSEHOLD SIZE



MINIMUM = **1**

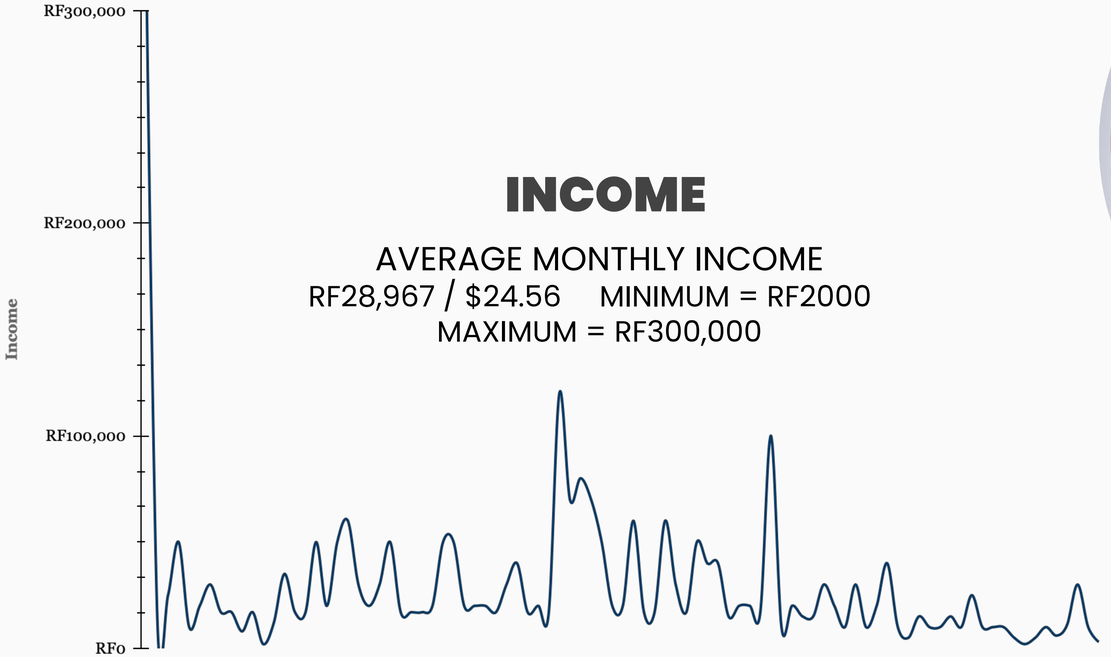
MAXIMUM = **9**

AVERAGE HH SIZE = **4**

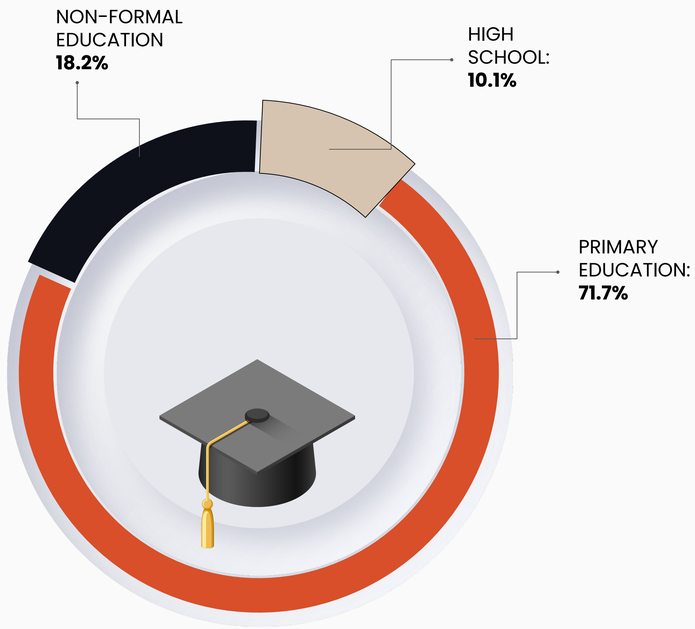
DEMOGRAPHIC CHARACTERISTICS

INCOME

AVERAGE MONTHLY INCOME
RF28,967 / $24.56 MINIMUM = RF2000
MAXIMUM = RF300,000



On average, income in Rwanda is low. According to the most recent national housing surveys, the average income of rwandans is around $80 per month

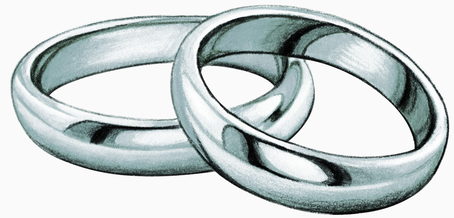


EDUCATIONAL LEVEL

Educational attainment levels are generally low for two main reasons: those with higher levels of educational attainment move to the urban centres for better job prospects. Secondly, this older generation lived through the genocide against the Tsutsi periods where the best chance of having higher educational qualifications was to move out iof the country. The lack of formal education does not however, stop them from acquiring skills necessary for a livelihood.

MARITAL STATUS

MARRIED 97% & WIDOWED: 3%



DEMOGRAPHIC CHARACTERISTICS

SOURCE OF ENERGY

SOLAR

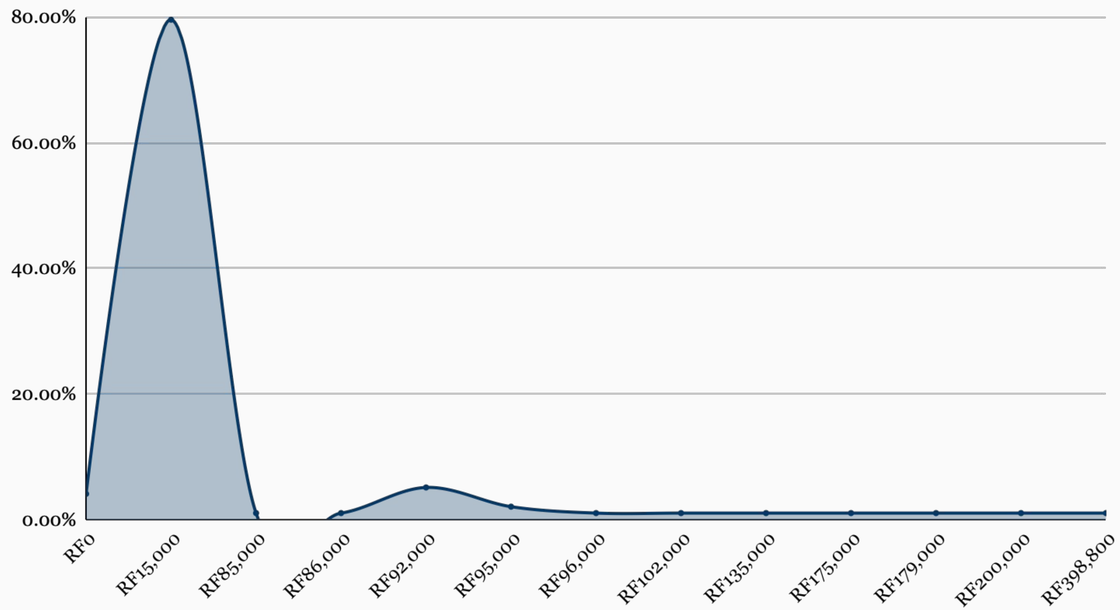
OTHERS:
FIREWOOD,
FLASHLIGHT,
PHONE LIGHT,
CANDLES

KEROSENE

MAIN (NATIONAL) GRID

INITIAL COST OF SYSTEM

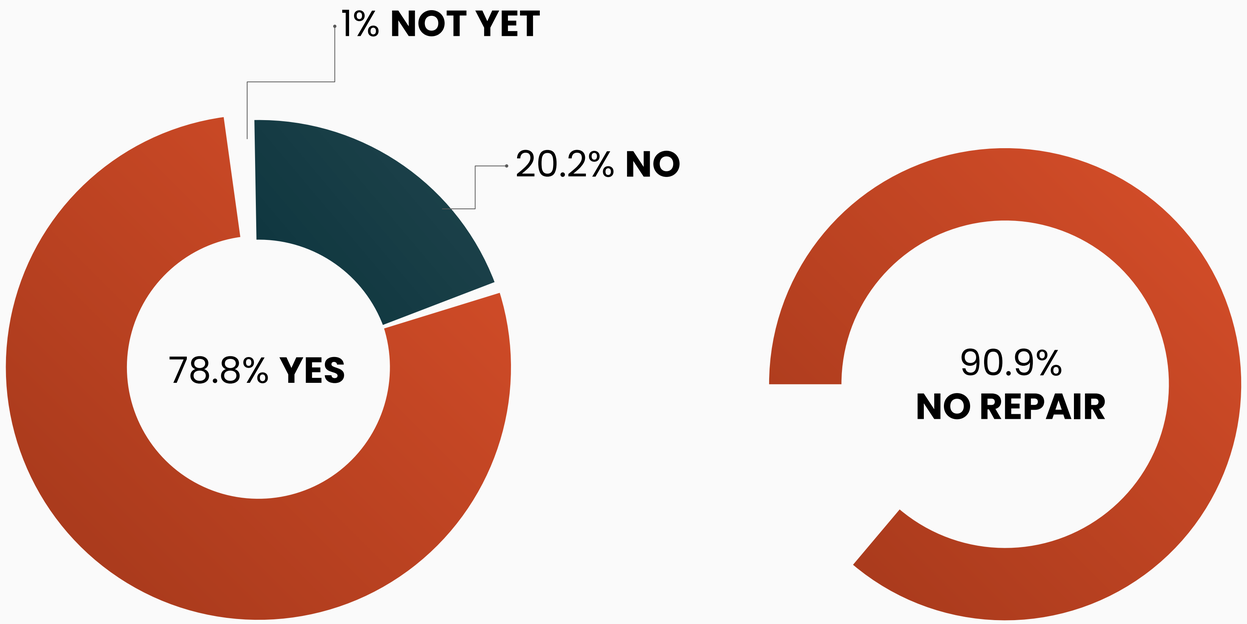
MINIMUM: RF15,000 MAXIMUM: RF398,800 AVERAGE RF34, 651:



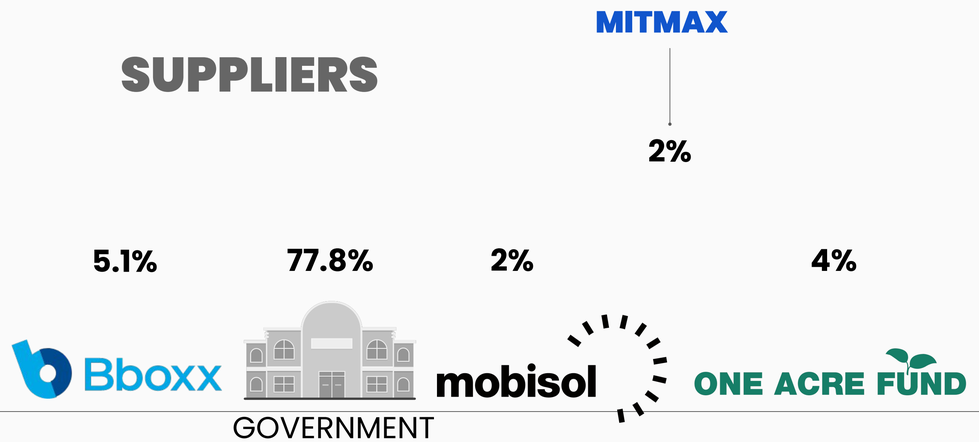
Initial Cost of SHS

ENERGY USE

SOLAR SYSTEM EVER BROKEN DOWN



SUPPLIERS



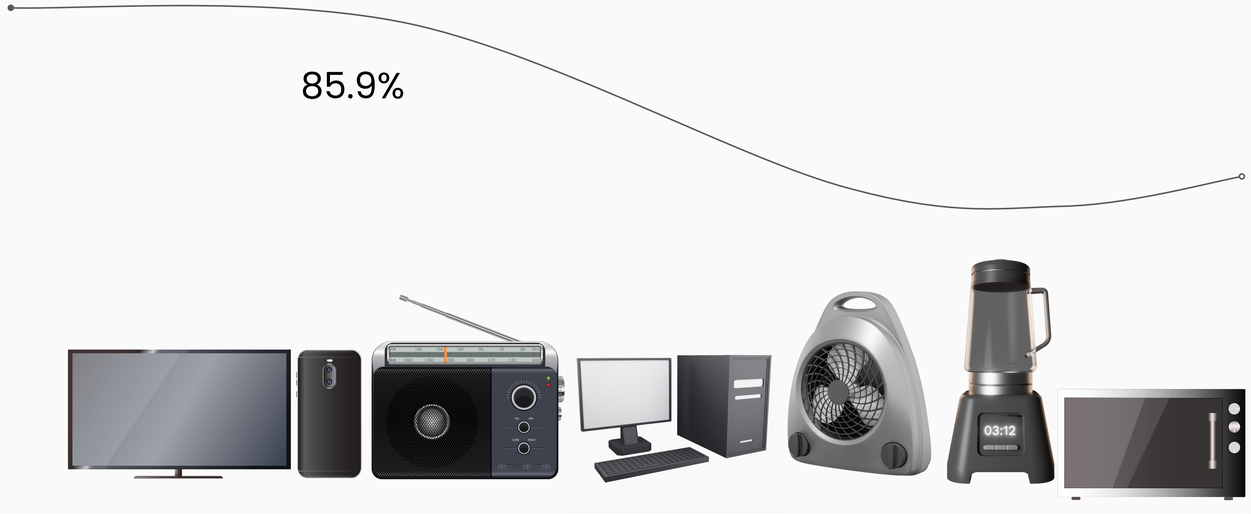
ENERGY USE

ELECTRONIC DEVICES OWNED

2% of the study participants do not own any device. None of the interviewees owned a smartphone as at the time of this interviews.

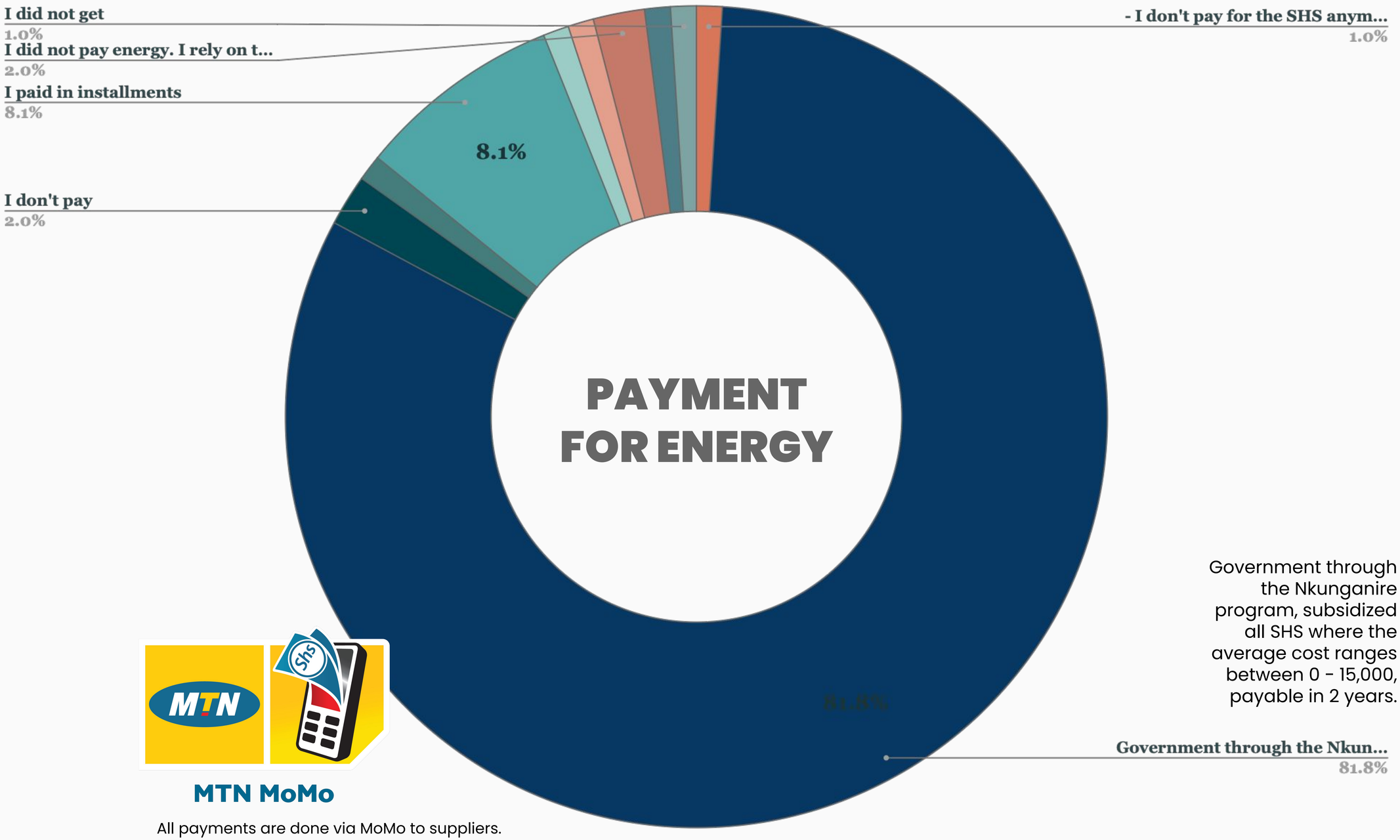
ELECTRONIC DEVICES RESPONDENTS ASPIRE TO OWN

Note that, in many of the in-depth interviews, many respondents wished for their children to be able to know how to use a computer. Other factors that influence their electronic device ownership aspirations is the proximity to an urban centre when they were exposed to these devices or, their exposure during travels to the city.



ENERGY USE

DOES THE SHS MEET CURRENT ENERGY NEEDS? NO | 100%



Government through the Nkunganire program, subsidized all SHS where the average cost ranges between 0 - 15,000, payable in 2 years.

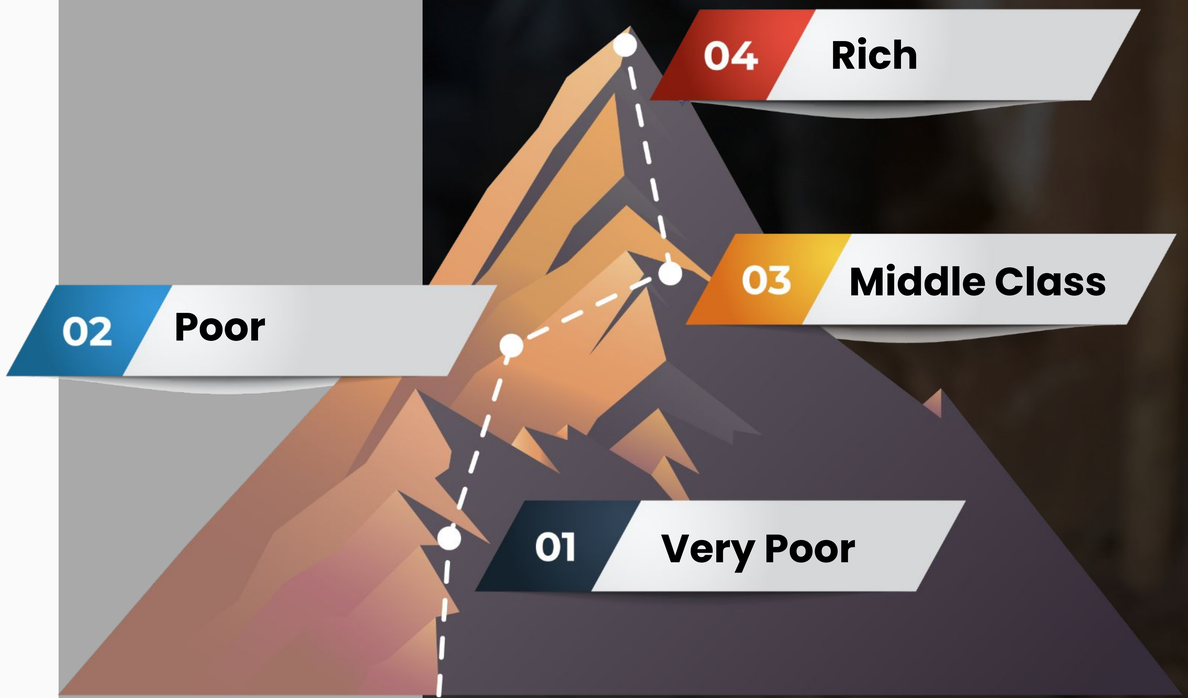
MTN MoMo

All payments are done via MoMo to suppliers. MTN MoMo is the most common method of financial transaction among rural households.

NOTE

Household Classification and Supply of Solar Home Systems

In order to alleviate vulnerable families' poor living conditions, the government classified its households by determining a person's standard of living and economic positioning at a cell level (Nizeyimana et al., 2018). The categorization changes every three years to address any changes from the communities' perceptions about the program.



The first category is those who are considered "**very poor**" who could not afford basic needs, renting or without houses and are affected by food insecurity; the second category is classified as "**poor**" who could pay for a house but are working for others as hard laborers; the third category are the "**middle-class**" population who could pay for their needs and work as professionals, farmers, and owns businesses; the fourth category is composed of individuals deemed to be "**rich**" and who are working as government officials or in a director level, and owns massive businesses (Rwanda, 2015). **Through this, the government can select eligible families needing special aid to advance the development of that category** (Nizeyimana et al., 2018).

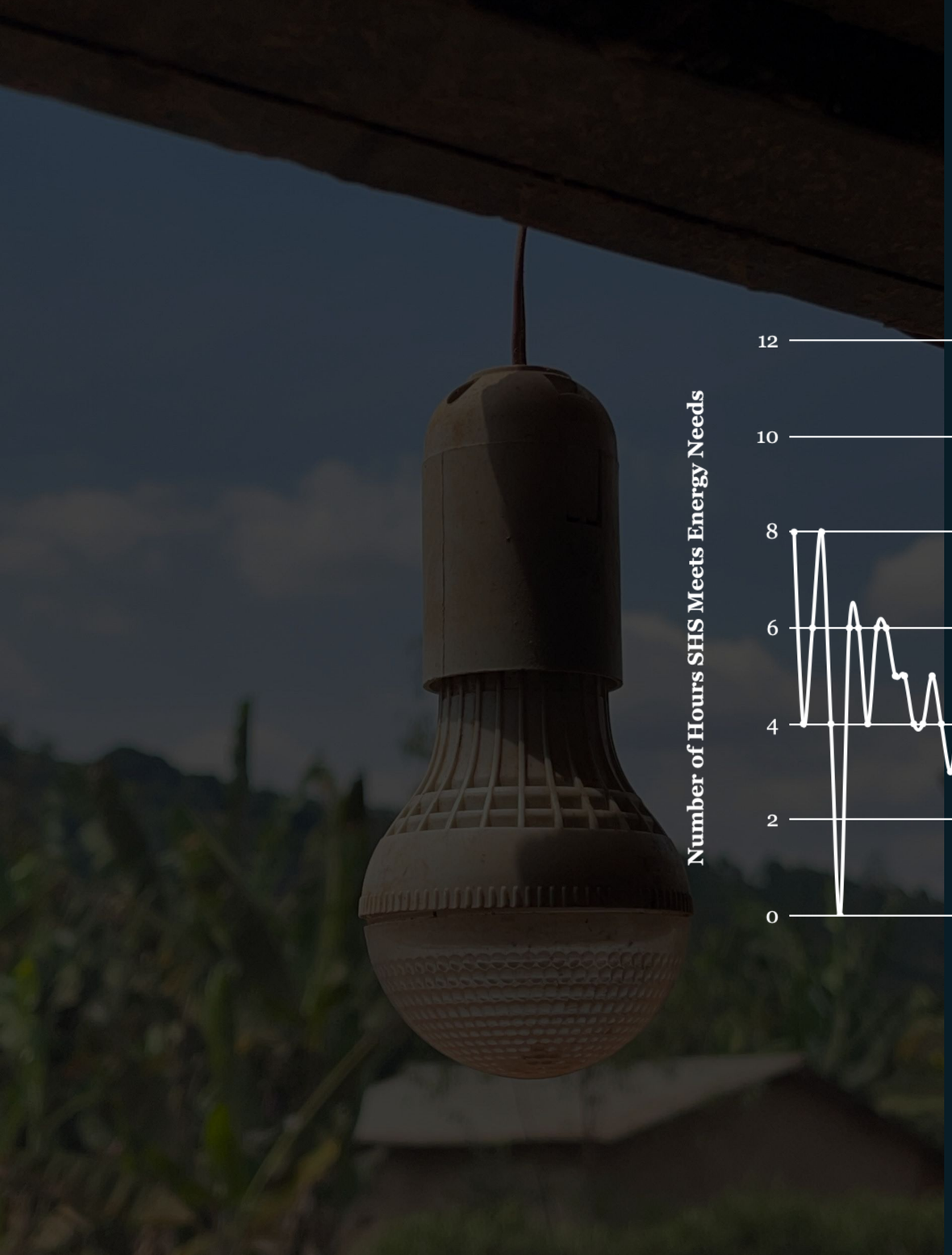
NOTE

Household Classification and Supply of Solar Home Systems

Most of the households interviewed currently use the government supplied systems. Many of this group had also already used SHS supplied by private entities.

Study participants have overwhelming appreciation of government efforts.

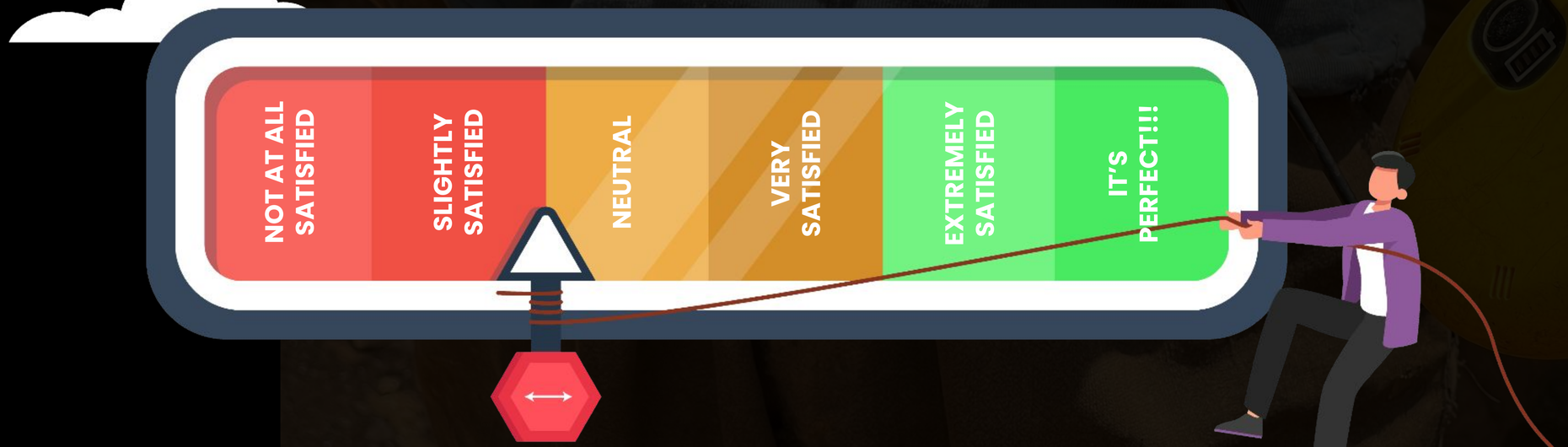
> **In all these experiences, respondents understand the positive impact a good solar home system will have on their lives and the lives (especially) of their children.**



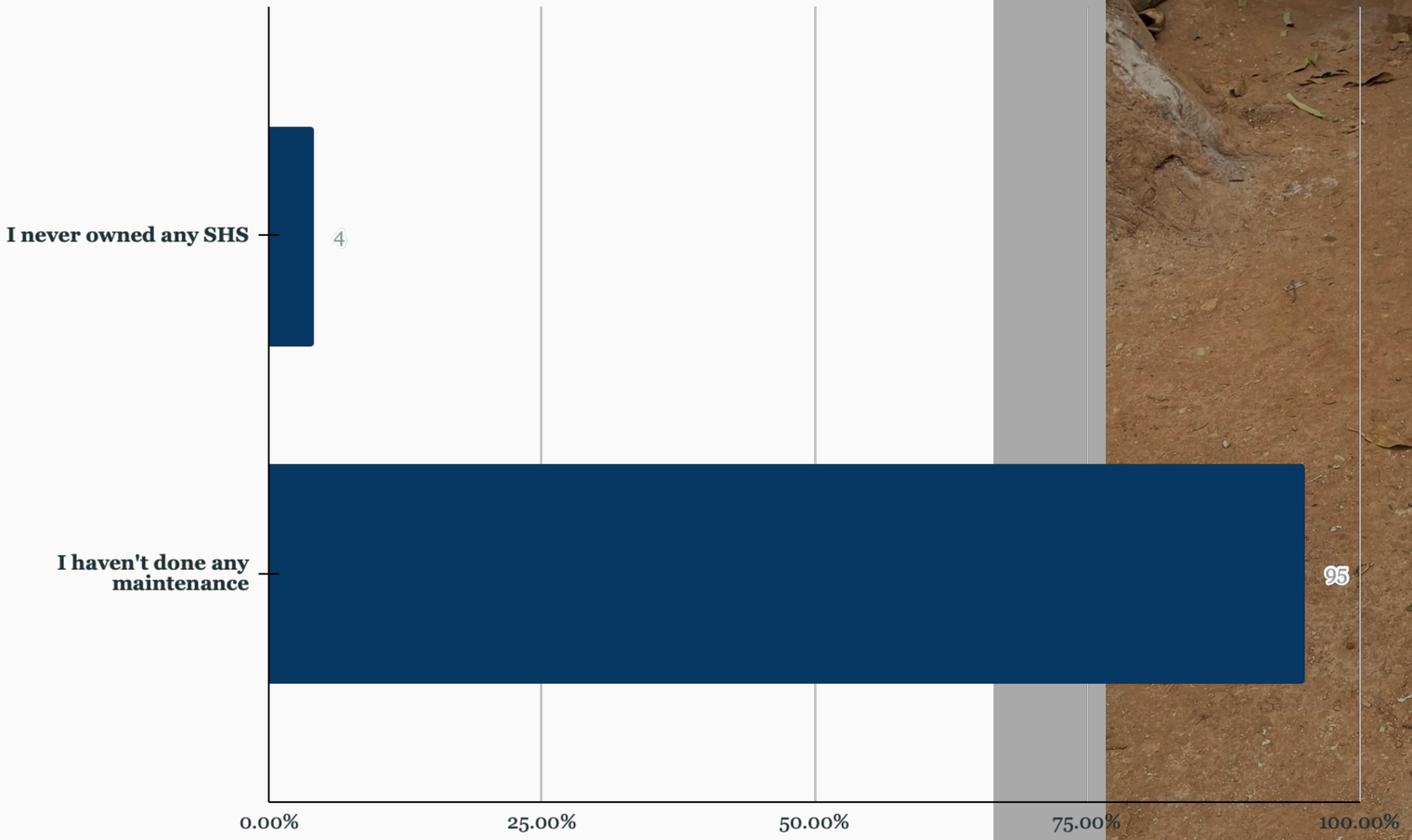
Number of Hours the SHS provides for the energy needs of household - this usage is **mostly during the day.**

LEVEL OF SATISFACTION WITH CURRENT SHS

15.46%	74.23%	7.22%	2.06%	1.03%	0%
1	2	3	4	5	6



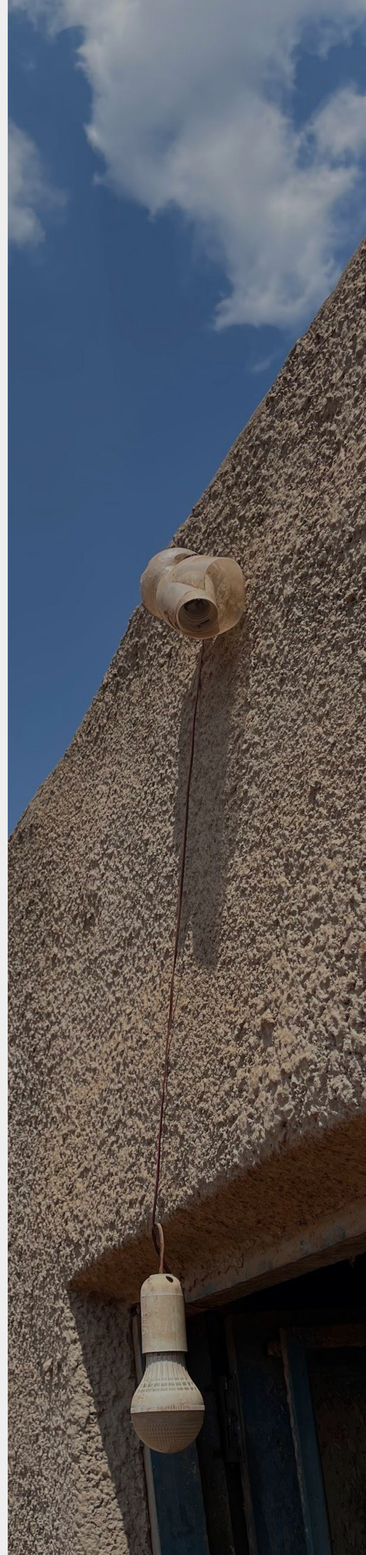
HOW OFTEN RESPONDENTS CARRY OUT SHS MAINTENANCE



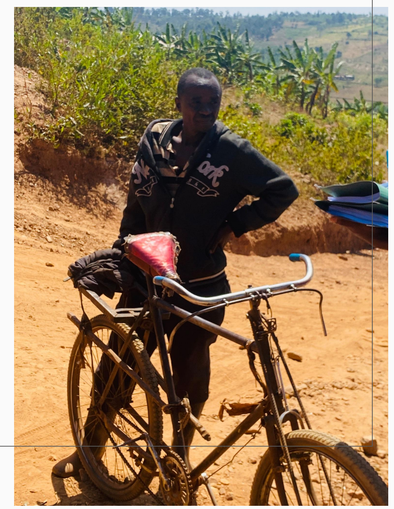
KEY FINDINGS & RECOMMENDATIONS

- Those who never received any form of SHS rely on Kerosene lamps and battery-powered torches;
- Majority of these are farmers earn below 10,000 Rwf a month;
- Some residents did not bother about purchasing a SHS because they considered it to be expensive, while others lacked information on how to acquire one;
- Some of the respondents also perceived the SHS to be inefficient based on the experience of their neighbours who had had the SHS;
- There are minimum activities due to a lack of lighting options in the community;
- Limited information regarding policies, ongoing events and other social related information due to the lack of electricity to power mass media tools (radio, TV or the internet);
- Households wish for their children to continue school but lack the means (the closest school facility is 5km away, no lights to revise after school) leading to poor academic performance;

- **All households wish to have a functioning SHS with enough power capacity; power storage capacity, especially during the rainy season and at night;**
- **They want to work for longer hours which can boost their productivity** in the community. Longer-lasting lighting options can bring this about.
- **They all want to see their children able to study anytime they want and access more information using technology.** The current situation is that children have to understand everything before leaving school or be compelled to wake up early in the morning to revise before the start of classes.
- **Access to functioning electricity would allow many economic activities, including barber shops and buying and establishing milling machines. Other economic activities would include carpentry, Welding, Sewing clothes and refrigerators.**



ACCESS



AWARENESS

People have little to no access to information about where they can get access to solar home systems. Even for some who have access to radios and TV, information shared on these mediums are not about solar.

AFFORDABILITY

Most study participants are able to afford solar home systems especially if they come with installment plans. This affordability is reduced drastically if maintenance cost is added

PAYMENT PLAN/SYSTEMS

Using MTN MoMo (most popular) or other mobile money payment platforms. Some service providers also have their own USSD codes which gives the buyer the flexibility of paying via any mobile money platform they have

MOBILITY

Most movements have to be done on foot. Few people have bicycles and even rarely, motorcycles. Some could afford to pay for transport via bicycles and motorbikes

QUALITY

CAPACITY

Capacity of the system to sustain what its equipped for and ability to have a level of tolerance for expansion of energy needs

RELIABILITY

Ability to store energy and use at night and during the raining seasons that there might not be sufficient sunlight

SERVICEABILITY

Complex systems are difficult to service. And often the right-to-service is withheld by the supplier. Local technicians are not trained to service the systems

LONG-TERM IMPACT

As useful as any systems could be, it will always be in competition with on-grid systems. The inability to scale to meet the energy demands of future gadgets will still place limitations on solar home systems.

Residents do however understand the long term benefits of reduced cost burden of paying for electricity.

What we want

"We just want to join the rest of the world"

- To see at night
- For our children to learn at night
- To reduce the burden of not having electricity
- To improve our income
- To know what is happening out there in the world
- To be able to listen to the radio or watch a tv
- To power my fridge so I can provide customers cold drinks
- To feel the pride and prestige of having light at night

How we want it

- Durable/sustainable
- Cost-effective
- Easy to operate & maintain
- Expandable capacity

What it could do

- Our children can learn and grow into good leaders of our country
- Our children can learn how to use computers
- Our children will spend less time getting firewood and more time learning
- We can work longer hours and earn more
- We can learn a new trade
- We can contribute more to our country

OTHER RESOURCES

- Raw Survey Data
- Photos
- Useful Background Information

Murakoze

Thank you...