

Economic growth through sustainable access to renewable energy solutions in rural Lesotho

TECHNICAL NOTE **#1**

Energy use and needs

Energy poverty in Lesotho remains a significant barrier to socio-economic development and the well-being of rural communities. Access to electricity is lower in rural areas at an estimated 11% (UNDP, 2017). There is a high reliance on biomass and fossil fuels and current renewable energy access levels are very low. Grid electricity infrastructure is unlikely to reach rural communities in the foreseeable future – necessitating alternatives that are sustainable and which address the energy needs of rural populations. The EU funded project, implemented by Positive Planet International (PPI) in partnership with Rural Self-Help Development Association (RSDA) contributes to the economic development of rural households in Lesotho by developing a sustainable social business within RSDA to promote and distribute energy efficient and renewable energy (EERE) products.

The project team conducted a demand side study to assess the current energy usage and needs of rural communities of Lesotho. The results of this study will inform the business model and the product selection of the RSDA social enterprise.

Reciprocity – a consultancy firm with relevant experience in developing sustainable business models at the base of the pyramid – played a key role in designing, conducting and analysing the results of the demand side study.

Methodology

Our team combined quantitative and qualitative research methodologies.

Research methodologies

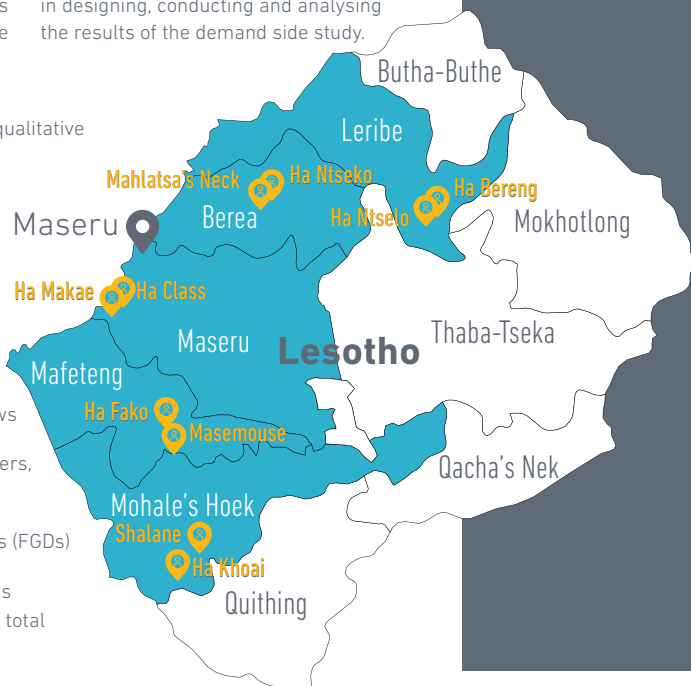
Quantitative research

180 surveys conducted with residents in 10 locations in Lesotho's five foothill districts (as shown on the map)

Qualitative research

Consisted of a multiple-layered approach that included:

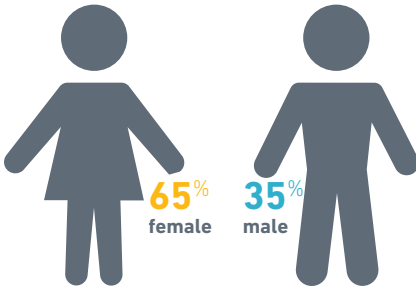
- A total of 25 semi-directive interviews conducted across five districts of Lesotho with a cross-section of traders, intermediaries, end users and community members
- A total of 19 focus group discussions (FGDs) with key stakeholders, including farmers and members of households
- A series of two-day immersions in a total of two villages



Key findings

Socio-economic and demographic indicators

GENDER DISTRIBUTION



The key findings of this study may differ from the national statistics as the sample of this research included only rural communities and is limited to five districts of Lesotho.

AGE GROUP

There is a significant over-representation of older people



Younger adults often work in towns or in South Africa, and send money home

DWELLING

Different energy needs for different structures

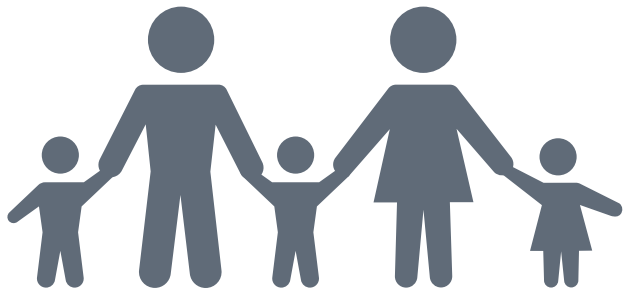
73% of homesteads typically consist of 2 or 3 structures and combine 'modern' and 'traditional' dwellings (usually polatas and rontaboles)



HOUSEHOLD MEMBERS

Households tend to be large

71% of respondents live in households with 5 or more members



EDUCATION AND SOCIAL MOBILITY

Youngsters tend to be better educated and more socially mobile

57% respondents have primary school education



9% respondents have secondary education

Socio-economic and demographic indicators *(continued)*

COMMUNITY

Community networks tend to be very entrenched and structured



More than **90%** belong to at least one organisation, usually a church group or a farmers' organisation

TRANSPORT

People mainly rely on public transport or walking for travel

Only **2%** of respondents have their own car

98% of the respondents rely either on public transport, horses or walking



TRAVELLING

Difficulty moving around is a constant reality

47% of respondents travel outside the village more than once a month



People 'travel to town' on a regular basis (weekly and more often monthly) at high cost – both time and money

Income and economic activities

DISPOSABLE INCOME

Disposable income is very limited: 73% of the households live on less than M999 per month

21% of respondents reported no personal income at all

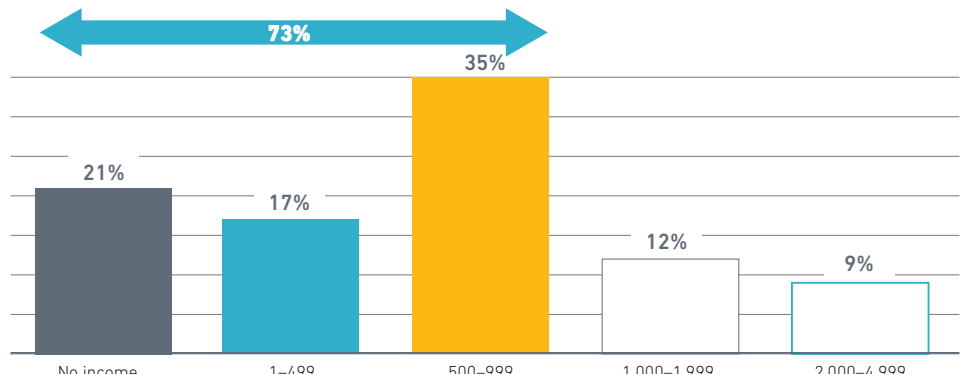
35% of respondents reported income of between 500 and 1000 Maloti per month

17% of respondents reported income of up to 500 Maloti per month

12% of respondents said they had a household income between 1000 and 2000 Maloti per month

9% of respondents had disposable income of more than 2000 Maloti per month

Monthly household income distribution



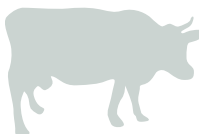
Income and economic activities *(continued)*

HOUSEHOLD CASH FLOW

Household cash flow is under constant pressure and requires careful budgeting and arbitrage

Items like **transport, schooling and energy** use up most of peoples' income

Large once-off expenses can usually only be covered by either taking on a **loan**, or **selling an asset** such as a **goat, sheep or cow**



FARMING

Farming dominates economic activities



54% of the sample population are farmers

33% are unemployed or not working

INCOME SOURCES

35% sell agricultural produce (crops, including wool)



Sell traditional beer

Sell bead work and crafts

A number of villagers are occasionally involved in 'cash for work' programmes driven by the public sector (road maintenance, and other local infrastructure projects)

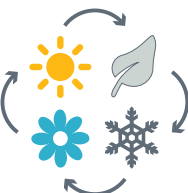


Remittances are the main source of income for **13%** of households

SEASONAL INCOME

Patterns vary – many people have slightly higher income during the winter and spring months (harvest time) and big expenses at the end and beginning of the year (Christmas, school supplies)

74% of respondents have fluctuating monthly incomes throughout the year



MOBILE MONEY

Mobile money use increases with income levels

Used by **39%** of respondents, M-PESA is the clear market leader with a 90% market share



Mobile money use is much more common among farmers who are members of farmer groups, at **56%**

ENERGY PURCHASES

Cash still dominates energy purchases, but non-cash channels are making inroads

72% of energy purchases are made in cash



52% of respondents use formal payment channels to make general purchases: either using a bank account, transfers through a retail chain store or mobile money



Energy sources and energy usage

There is a clear distinction between households using only 'free' sources of energy (for instance animal dung, wood, maize cobs and shrubs)



and households spending some of their income on energy ("paid energy" such as paraffin, candles, gas, solar energy, coal and charcoal)



Wood and paraffin remain the dominant sources of energy:

69% of respondents use wood or plants as the main source of energy for cooking



72% of respondents use paraffin as the main source of energy for lighting



79% use wood as the main source of energy for heating



Penetration of paid energy sources in households:

Paraffin is used by **90%** of respondents



Batteries are used by **60%** of households



Candles are used by **50%** of households



Only **22%** of respondents use gas

92% of respondents pay for lighting

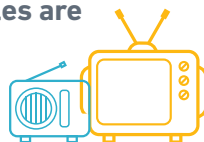
only **34%** of respondents paid for energy sources for cooking

and **18%** for heating



The key opportunities for commercial energy sales are

- lighting,
- charging and
- entertainment (radio and TV)



HOUSEHOLD SPENDING PATTERNS ON ENERGY

Respondents spend **70%** more on energy in winter than in summer: the total average monthly household expense in our sample on energy (all sources combined) is **M159**.

However, that average varies significantly according to the season: in winter, average spend rises to **M194**, dropping to **M165** in midseason and **M114** in summer.

Higher household income levels are clearly correlated with more spending on 'paid' energy sources such as paraffin, gas and solar energy.

Paraffin users tend to spend the most: their monthly spend is an average of **M162** throughout the year

Candle users spend an average monthly amount of **M62** per household

Households that regularly charge cellphones report spending **M52** per month on average

Analysis of findings

OPPORTUNITIES

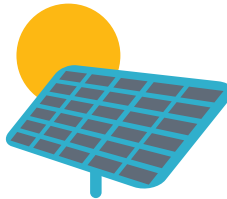


Paying consumers are open to using several alternatives to fulfill their energy needs. There is disposable income and most households already spend some money on energy, especially lighting and charging phones.

There is a high and growing penetration of formal payment channels, especially mobile money.

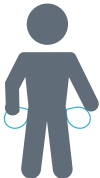


There is significant familiarity with and awareness of EERE products including solar lights and clean cookstoves and their health benefits.



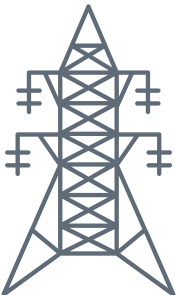
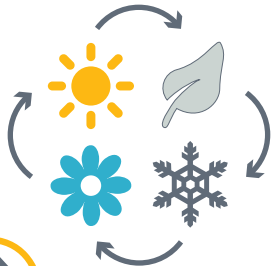
There is a growing level of mobile phone penetration and significant demand for phone charging.

OBSTACLES



Low income levels, greatly influence energy usage: behaviours are dictated by availability of cash flow rather than needs.

High income seasonality.



There is a relatively high lack of trust due to questionable quality and poor maintenance of existing solar devices and some cookstoves: after-sales service and maintenance will be a key driver in promoting EERE devices.



Fear that adopting EERE products may cause people to lose the chance of ever being connected to the grid.

Lessons learned

PRODUCT RANGE

- Primarily focus on energy needs currently fulfilled by paid sources: **lighting and charging and alternatives to candles/paraffin**
- Products should offer a **financial return on investment** as a money saver and/or money generator

PRICING AND PAYMENT CHANNELS

- Affordability is a critical factor
- People are prepared to pay for quality, but they need to trust the products and will require a warranty
- Selling on credit is not likely to work, given high default rates and widespread indebtedness
- Pay-As-You-Go models need to be explored and tested
- While M-PESA and Ecocash's footprints and market share are growing fast, there is a degree of skepticism about the reliability (and practicality) of mobile phone payments. Younger people tend to be more positive and confident about the possibility of EERE devices being paid for by M-PESA



PLACE AND PROMOTION

- **Price:** we will need to offer value for money and payment facilities (including PAYGO solutions)
- **Distribution:** our products should ideally "come to" the customer, as 60% of people who purchase energy do so near to where they live. This means that the reseller model is probably an ideal channel to promote EERE products: door-to-door sales and through public gatherings
- **Payment channels**
 - Cash needs to remain an option for customers as it is still the most widely accepted and available means of payment
 - Mobile money is an opportunity: with 39% penetration and 55% amongst respondents spending more than M150 a month on energy sources
 - Migrant workers and remittances constitute a significant opportunity, not only to buy on behalf of their relatives, but also to spread awareness



Lessons learned (continued)

RESEARCH METHODOLOGY

What worked well	What was challenging
Multiple insights were obtained from participants	Occasionally had too many FGD participants
High-quality quantitative data was extracted from the pre-FGD surveys, enabling us to enrich our insights through comparisons with the UNDP energy study	Pre-FGD questionnaires had to be revised and adapted
Gained a better understanding of specific needs and expectations of the market	Ensuring the interlocutors were representative of the general population
Record-keeping and organisation of FGDs and pre-FGDs worked well	Managing expectations of participants
Great note-taking and record-keeping	Ensuring the representativity of our samples



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