

GTZ – EUEI/PDF (Energy for sustainable  
Development)

**Lesotho Energy Access Strategy project**

Contract Number: 83001486

**BASELINE STUDY REPORT**



PDC, Synopsis, Raps Consulting



SYNOPSIS



18 April 2007

## TABLE OF CONTENTS

1.	Introduction.....	5
2.	Background.....	5
3.	Methodology.....	9
4.	Socio-economic overview.....	12
5.	Energy Use.....	18
5.1	Summary of energy use per ecological zone .....	18
5.2	Domestic fuel use for all purposes.....	20
5.3	Cooking fuel use .....	22
5.4	Space heating .....	24
5.5	Lighting.....	27
5.6	Fuel collection.....	28
5.7	Fuel consumption data .....	32
5.8	Appliance ownership .....	33
5.9	Preferred fuels.....	33
5.10	Affordability and reliability of fuels .....	34
6.	Productive use of energy.....	36
6.1	Current income generating activities .....	36
8.	Conclusions and preliminary recommendations.....	42

## List of Tables

Table 1: Villages and areas included in the survey.....	6
Table 2: Primary Sampling Units (PU's) .....	9
Table 3: Biomass fuel use per ecological zone.....	19
Table 4: Commercial fuel use per ecological zone.....	20
Table 5: Cooking fuel consumption.....	32
Table 6: Stoves owned by households .....	33
Table 7: Average household income.....	37
Table 8: Agricultural contribution to household income.....	39
Table 9: Households involved in other income generating activities .....	39
Table 10: Energy input in income generating activities .....	40
Table 11: Contribution to household income.....	40
Table 12: Challenges facing households (entrepreneurial perspective) .....	41
Table 13: Services available and utilised.....	41

## List of Figures

Figure 1: Map illustrating the location of the baseline survey areas .....	5
Figure 2: Access to villages .....	7
Figure 3: Access road to Ha Mpeshe in Berea.....	7
Figure 4: Village access road to Mohale's Hoek.....	8
Figure 5: Respondent male/female split .....	8
Figure 6: Setting aside the estimated fuel requirements for the day.....	10
Figure 7: Weighing wood .....	11
Figure 8: Weighing shrubs.....	11
Figure 9: Weighing dung .....	12
Figure 10: Male/female split for heads of households.....	13
Figure 11: Age distribution of heads of households .....	14
Figure 12: Household sizes.....	14
Figure 13: Income categories of male and female headed households.....	15
Figure 14: Main sources of regular income for household heads.....	16
Figure 15: Number of income earners per income category.....	17
Figure 16: Education levels for household heads .....	18
Figure 17: Biomass fuel use per zone.....	19
Figure 18: Number of households using different fuels .....	21
Figure 19: Cooking fuel use.....	22
Figure 20: Pot cooking on open fire – typical cooking method.....	23
Figure 21: Improved cook stove .....	24
Figure 22: Space heating fuel use .....	25
Figure 23: Water heating fuel use.....	26
Figure 24: Lighting fuels use .....	27
Figure 25: Solar panel used for battery charging and lighting.....	28
Figure 26: Fuel collection data in times per week, duration of trip and gender of collector .....	29
Figure 27: Headload, wood collection .....	30
Figure 28: Wood stacked .....	31
Figure 29: Dung stacked for drying .....	31
Figure 30: User preference for different energy carriers, independent of price and availability.....	34
Figure 31: Clustered income categories.....	37
Figure 32: Income from agriculture.....	38

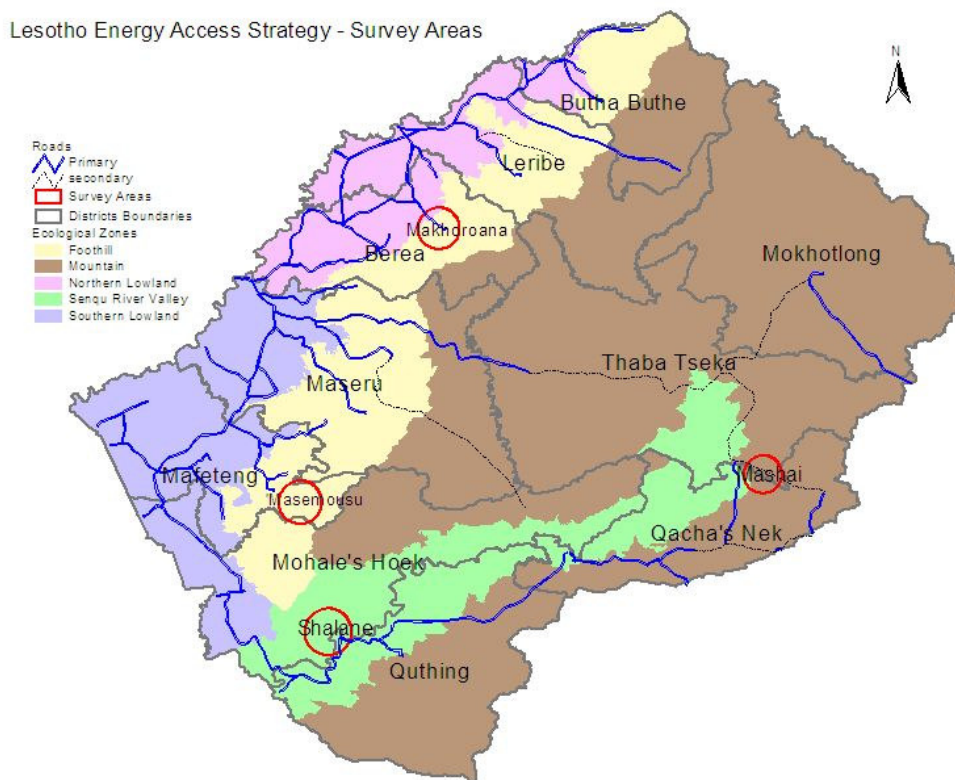
## 1. Introduction

As part of the GTZ – EUEI/PDF Lesotho Energy Access Strategy Project, a baseline study was conducted to collect data on the energy demand and consumption of the target population (low-income households in rural and peri-urban areas of Lesotho). Fieldwork took place from 7 – 11 February 2007. The 15 fieldworkers participating in the study received training on 6 February 2007 and a pilot study was conducted in Matukeng, a peri-urban, un-electrified area close to Maseru.

## 2. Background

The baseline study was carried out in three different ecological zones (mountain, foothill and Senqu river valley) divided in 4 different areas (Mashai, Masemousu, Makhoroana and Shalane). In each area, a number of villages were visited. The map in Figure 1 below illustrates the study areas:

**Figure 1: Map illustrating the location of the baseline survey areas**



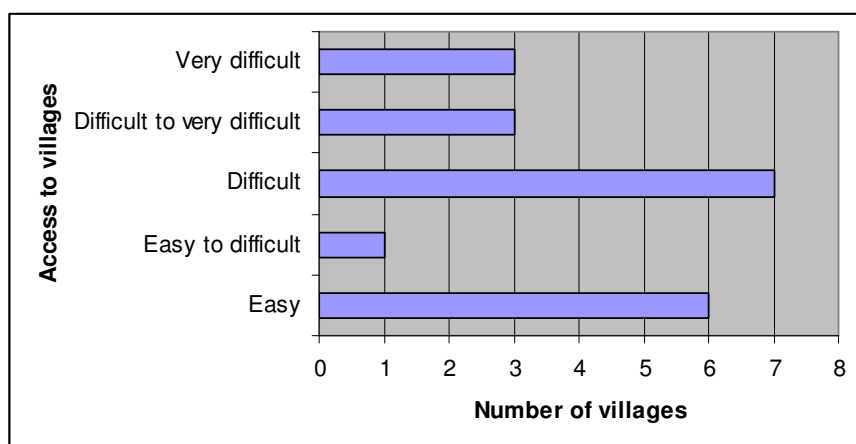
In total, 20 villages were visited and a total number of 320 interviews conducted, however only 318 interviews could be used for analysis due to missing data in the remaining two questionnaires. The specific villages visited, as well as the fieldworker's impression of the access to each village, are illustrated in Table 1:

**Table 1: Villages and areas included in the survey**

<b>Area</b>	<b>Villages</b>	<b>Access to villages</b>
Mashai	Ha Mofolo	Easy to difficult
	Likotase	Very difficult
	Tsolo	Very difficult
	Ha Nkofo	Difficult to very difficult
Makhoroana	Machoabeleng	Easy
	Moletsane	Easy
	Ha Mosema	Easy
	Ha Mpeshe	Difficult
	Ramahoete	Easy
	Makhaleng	Easy
	Mokollong	Easy
	Thota Tsela	Difficult
	Ha Matheka	Difficult to very difficult
Masemousu	Ha Sechaba	Difficult
	Ha Tsoene	Very difficult
	Molelloa	Difficult
	Motsoloane	Difficult
	Khokhoatsaneng	Difficult to very difficult
Shalane	Makilanyaneng	Difficult
	Shalane	Difficult

As can be seen from Table 1 and Figure 2, access to the majority of villages was rated by fieldworkers as difficult or very difficult:

**Figure 2: Access to villages**



The pictures (Figure 3 and Figure 4 below, illustrate the state of the roads to some of the villages:

**Figure 3: Access road to Ha Mpeshe in Berea**

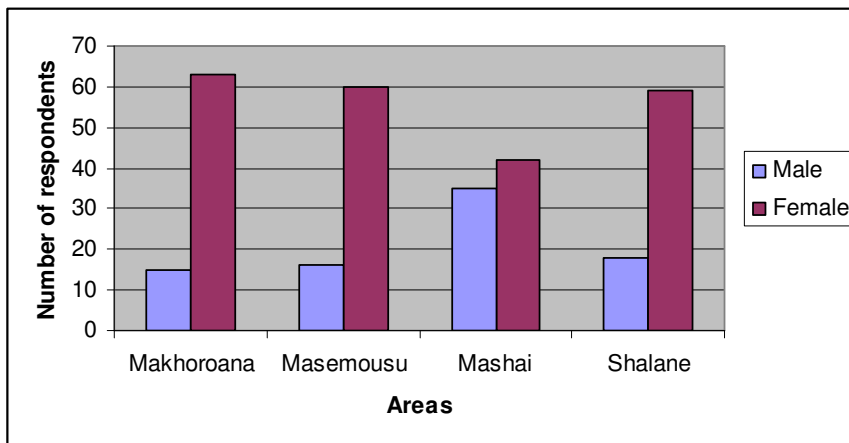


**Figure 4: Village access road to Mohale's Hoek**



The majority of the respondents were female (224) and the male/female split per area is illustrated in Figure 5:

**Figure 5: Respondent male/female split**



The graph shows uniformity among all areas but Mashai. The reason for this is the prevalence of more households consisting of men only (17 in total) as opposed to



Masemousu (5), Makhoroana (4) and Shalane (6), meaning that more men are responsible for cooking and energy management.

The high number of female respondents indicates that fieldworkers followed the directive to interview the person in the household responsible for energy management and cooking (which in most cases is the woman in the household).

Two (2) households consisted of single men, twenty-three (23) households consisted of men only.

### 3. Methodology

The Lesotho Bureau of Statistics prepared the sampling of the areas in which to conduct the baseline study. A list of areas outside the electricity service area was prepared. The Bureau of Statistics Master Sample Frame of Primary Sampling Units (PSU's) was used to construct a list frame. Stratification of PSUs by ecological zone was done. Ecological zones include mountain, foothill and Senqu River Valley. PSU's were stratified by ecological zones without considering crosscutting of district and constituency. One PSU was selected in each ecological zone using a simple random sampling technique. The results are illustrated in Table 2, below:

**Table 2: Primary Sampling Units (PU's)**

PSU number	District	Area	Zone	Villages
6243	Thaba-Tseka	Mashai	Mountain	Ha Nkofo, Tsolo, Motsekuoa, Ha Mofolo, Likotase
	Mafeteng	Masemousu	Foothill	Ha Sechaba, Ha Matheka, Ha Matsoloane, Ha Tsoene, Ha Molelloa
	Berea	Makhoroana	Foothill	Ha Ramahoete, Machoaboleng, Khetha Ha Mpeshe, Thota Tshela, Makhalaneng, Mokoallong, Moletsane
	Mohale's Hoek	Shalane	Senqu River Valley	Khokhotsaneng, Makilanyaneng, Shalane

Fieldworkers were instructed to interview the first household on the left of the entry point into the village and thereafter interview every fifth household. This was done to ensure a random selection of households.

Data collection was through a structured questionnaire (enclosed as Appendix A).

During the course of the interview, the cook was asked to put aside the amount of dung, wood and/or coal used in one day for cooking (see Figure 6, below). The fuel was placed

in a plastic zip bag (see Figure 9). This was weighed on an electronic hanging scale and the weight for each fuel recorded on the questionnaire. In the case of paraffin, the amount used for cooking for one day was poured out into a measuring jug, and the millilitres recorded. In the case of gas, the size of the gas bottle was recorded and the cook was asked how long the gas lasts.

The pictures below illustrate the fuel weighing process.

**Figure 6: Setting aside the estimated fuel requirements for the day**



**Figure 7: Weighing wood**



**Figure 8: Weighing shrubs**





**Figure 9: Weighing dung**



#### **4. Socio-economic overview**

The following section will provide an overview of the socio-economic characteristics of the households in the study area. The first part will provide a comparative profile per zone while the second part will provide an analysis on the total sample. This was deemed the best way to present the analysis since the differences between the three ecological zones were not that marked, and secondly, the larger sample of the three zones added together provided more meaningful analysis.

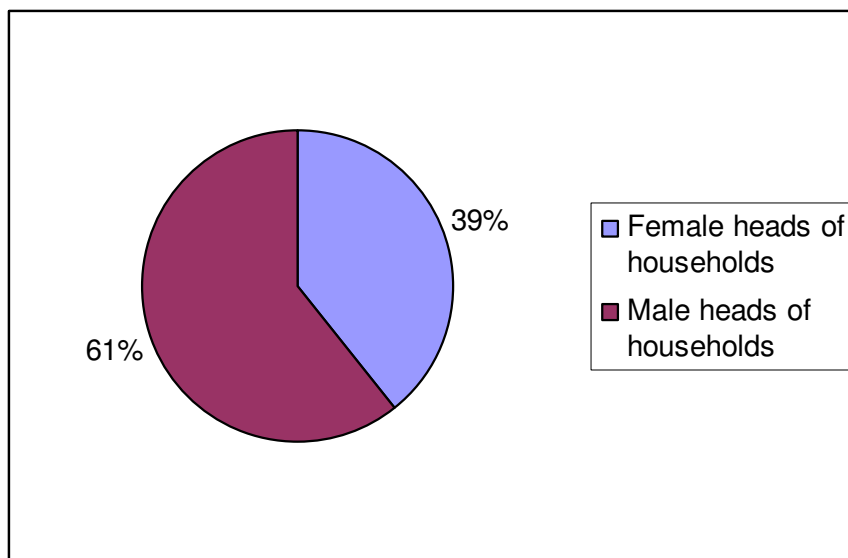
Household sizes varied slightly per area with Mountain households consisting of 6 members, Foothill households of 4 members and Senqu River Valley Households also of 4 members. In the Mountain zone, 51% of households reported having one member earning a regular income, while 58% of households in the Senqu River Valley reported having one member earning a regular income. The lowest percentage of households with a regular income was in the Foothill zone (44.9%) where 37% of households also indicating have no regular income at all. However, it was also in the Foothill zone where the highest levels of income per household was reported with most households having access to two or three incomes per household. Most income where derived from cash crops (often through the sale of marijuana) and this zone also boasted the highest household income recorded of between M5000 and M6000. In the Mountain and Foothill zones, the majority of households (53% and 52% respectively) reported earning below M500. From the available data, it was not possible to conclude that one ecological zone

was clearly worse or better of then the other, although the Foothill and Senqu River Valley could be viewed as slightly better off than the Mountain zone.

In terms of the gender spilt for heads of households, it was only in the Senqu River Valley zone that there were more female than male heads of households (female 57% and male 44%). In the Mountain and Foothill the ratio was female 47% and male 53% and female 41% and male 58% respectively. As can be seen from the above, no marked difference could be discerned per zone in terms of specific household characteristics and the following section therefore, analysed the data as a whole.

In terms of household heads, the youngest household head in the sample was 14 years old (female) while the oldest was 90 (male). The male/female ratio of household heads is illustrated Figure 10, below:

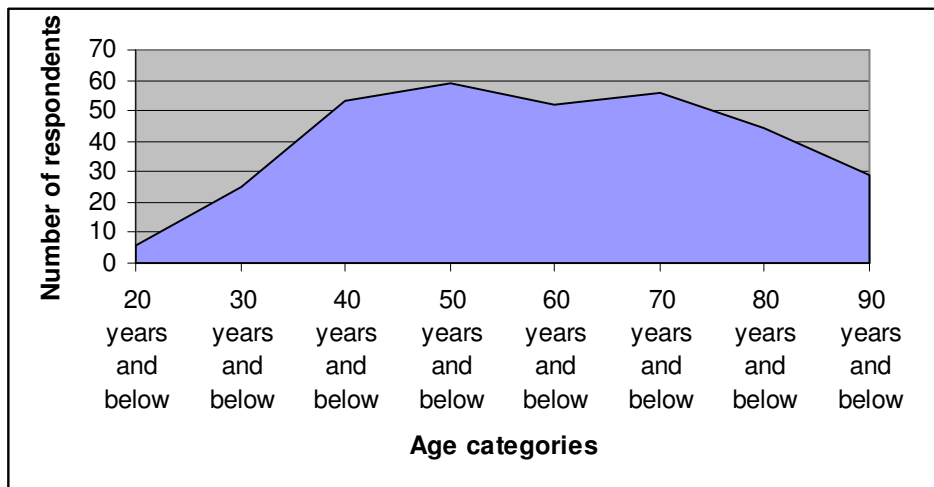
**Figure 10: Male/female split for heads of households**



It should be noted that the study did not investigate the reasons why a specific gender was elected as a household head. However, where a male is part of a household, the accepted trend is that he will be regarded as the head of the household, even in cases where he may not be physically present in the household, for example working away as a migrant worker. Women are regarded as heads of households in cases where they are the oldest member of the households (all men present are much younger) or in cases where they are breadwinners, widows or single females.

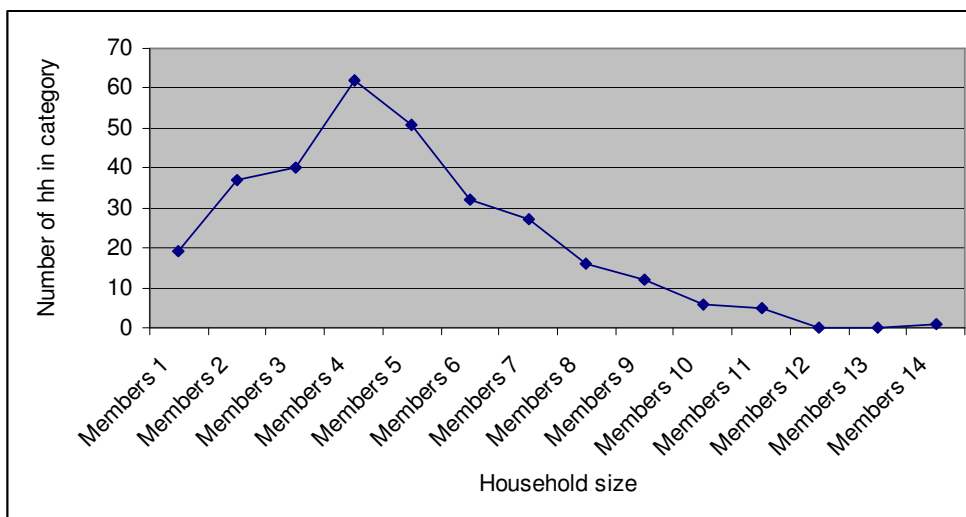
The average age of household heads was 52 years while the spread of the sample across age groups is illustrated below:

**Figure 11: Age distribution of heads of households**



The average household consisted of 4.7 members. The largest household had 14 members and the smallest households consisted of a single person (19 households in total). As can be seen from Figure 12, most households in the sample consisted of between 2 and 6 members.

**Figure 12: Household sizes**

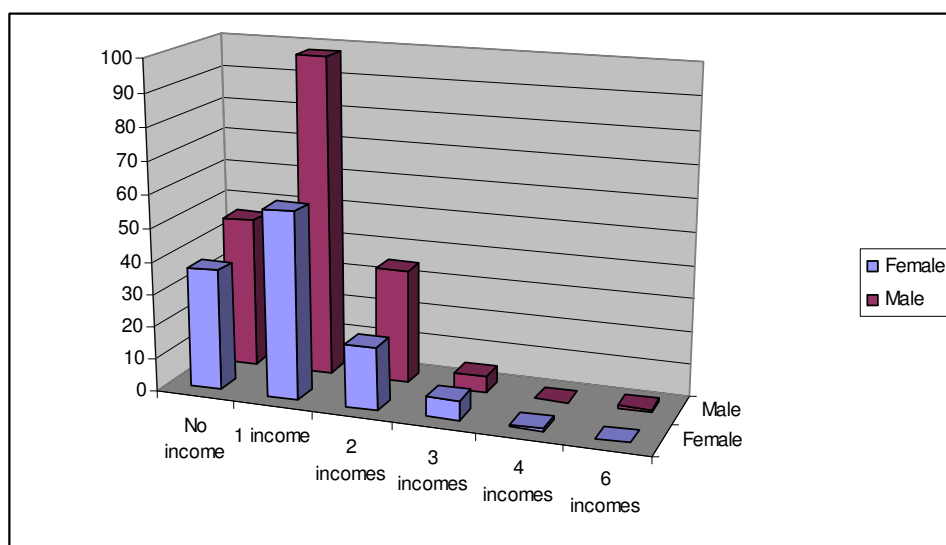


Thirty five percent (35% or 110) of the households had a member working away or not living with the household. This figure is relatively low considering Lesotho's high incidence of migrant labour and could reflect on-going down-sizing activities in the mines in South Africa but may indicate the decline of migrant labour due to mine closures in South Africa.

Twenty seven percent (27%) or 86) of the households in the sample reported no regular household income at all while one household could rely on the regular income of 6 people. Fifty percent (50%) or 158 of the households reported relying on one income per household while eighteen percent (18%) could rely on two incomes per household while three percent (3%) of households could rely on three regular incomes for the household. These figures may seem high but it must be noted that household incomes are very low.

The various income categories of male and female headed households are illustrated in Figure 13, below:

**Figure 13: Income categories of male and female headed households**

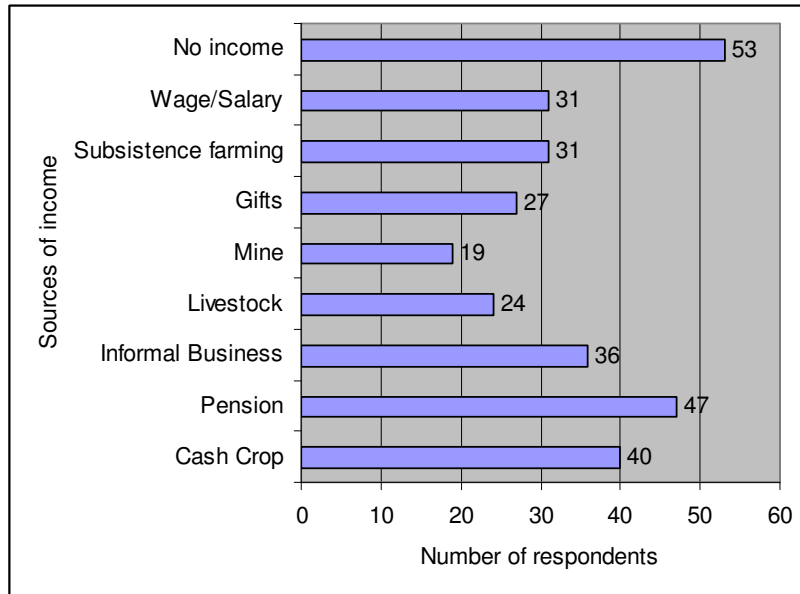


As a percentage of the number of male or female headed households, more female than male headed households have no regular source of income. This corresponds with the general trend that female-headed households are often more vulnerable than male-headed households for a variety of reasons such as inability of women to find work, household responsibilities of child-rearing and taking care of relatives or lower levels of training and education of women as compared to men. However, in households where two or more incomes could be relied upon, female headed households were slightly better off than

their male counterparts, mainly due to the fact that female headed households in the study also had other members of the household earning an income whereas male headed-households were often single income earning households.

In terms of the main income sources of income for household heads, pensions and cash crops emerge as important sources, illustrated in Figure 14. Furthermore, although pensions are an important source of income, pensioners only receive M150.00 per month (about \$21).

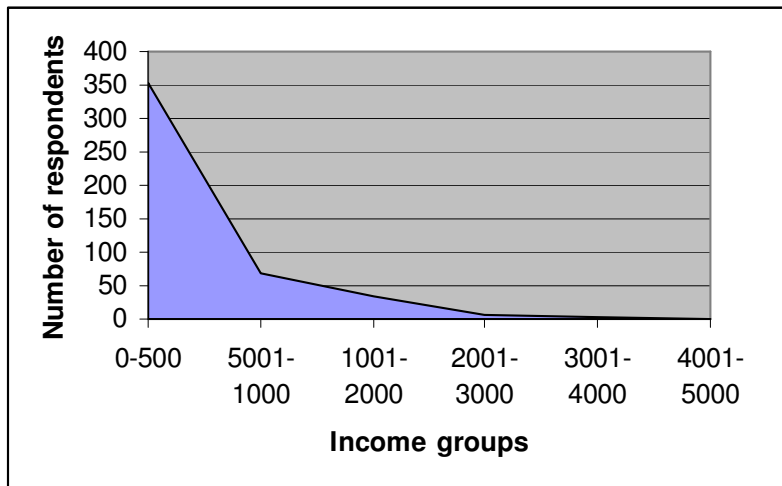
**Figure 14: Main sources of regular income for household heads**



Most income earners (354 out of 467) reported earning between M0 and M500 per month and where specific incomes were declared, amounts were often below M150. The number of individuals per income category is illustrated in Figure 15, below:



**Figure 15: Number of income earners per income category**



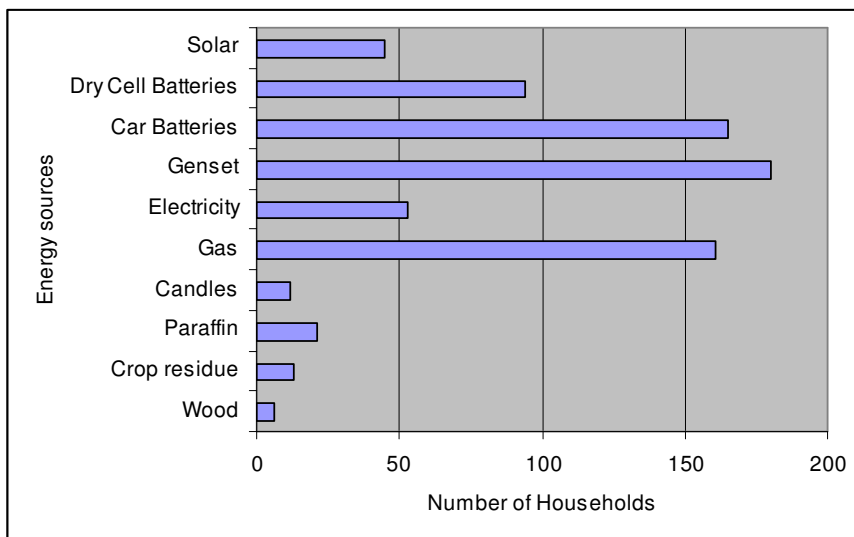
Although a high number of individuals (467) reported some form of income, not all of these incomes could be relied upon as a regular source. It should be noted however, that 51% of all households in the sample did indicate that they rely on a regular source of income. This is fairly high – just over half the sample.

#### **Household income is discussed in more detail in section**

##### **5.10 Affordability and reliability of fuels**

As indicated in section 5.2, all commercial fuels were perceived as being expensive by some households, although more households considered certain fuels expensive. The highest number of households considered gensets, car batteries and gas expensive, as illustrated in Figure 31, below:

**Figure 31: Number of households considering specific fuels expensive**



Interestingly, gas was considered more expensive than solar and even electricity, although lack of experience with regard to electricity may be the cause of the response.

It is clear that households perceive the cleaner sources of energy such as gas, solar and batteries as more expensive than traditional biomass fuels and also paraffin which is considered an environmentally harmful fuel due to its potential health and safety problems. Of non-commercial or biomass fuels, only wood and crop residues were considered expensive by a small number of households (6 and 13 households respectively). In all cases, the households reported being forced to buy the fuels, either because of lack of access to crops and therefore crop residues or physical problems such as age and illness preventing the collection of fire wood. Households collecting biomass fuels did not report expense associated with the fuel, either in terms of collection time or opportunity cost due to lost time that could have been spent on other activities. As concluded in section 5.2, access to fuels did not seem to be the problem experienced by households, but affordability was identified as the main barrier to using fuels other than biomass.

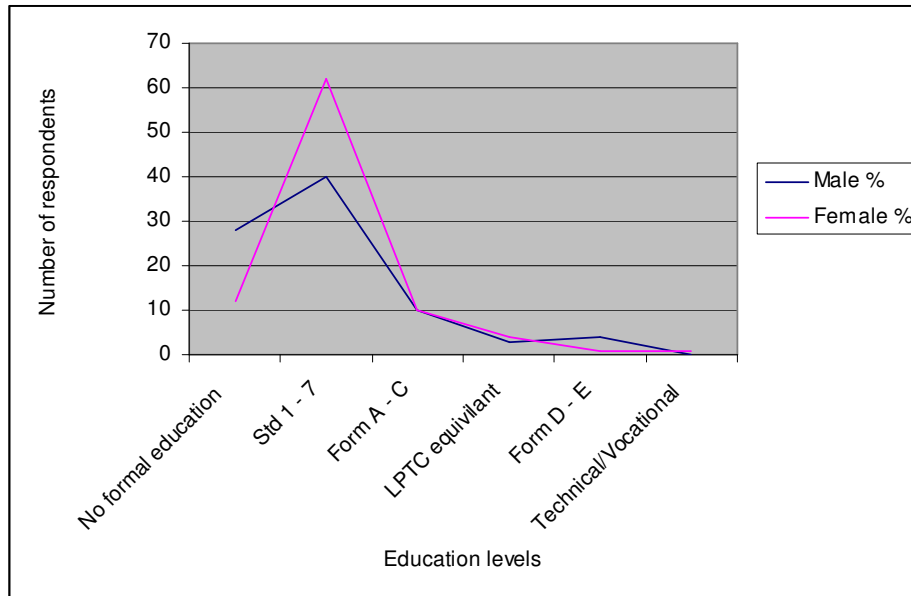
In terms of reliability of fuels, households were not directly questioned on their perceptions of the reliability to fuels. However, some conclusions can be drawn from other responses. For example, some biomass fuels such as dung and crop wastes are used seasonally and availability is therefore restricted during the off-season. Specifically in the Mountain zone, 59% of households reported not using crop residues, also indicating that is not always available. Wood, which emerged as the most used biomass fuel source was not experienced as unavailable by the majority of the sample (98%) but if the average wood fuel collection trip of 3.2 hours twice a week across the sample is considered, it is clear that households, and especially women responsible for collection,

spend a lot of time to secure the energy source. The proposed Energy Strategy will address sustainability of energy supply and demand in more detail.

## 6. Productive use of energy

In terms of education levels, one focus point was the analysis of the education level of the heads of households. Female head of households were in general better educated than men. From the figure below it can be seen that fewer women than men had no formal education and more women had completed Std 7.

**Figure 16: Education levels for household heads**



In summary, the data suggests that no sharp differences could be discerned between the three ecological zones, making it difficult to pronounce one area clearly worse off than the others. However, the Mountain area (although slight) seems to be the least well-off of the three areas but it is emphasised that the difference is slight.

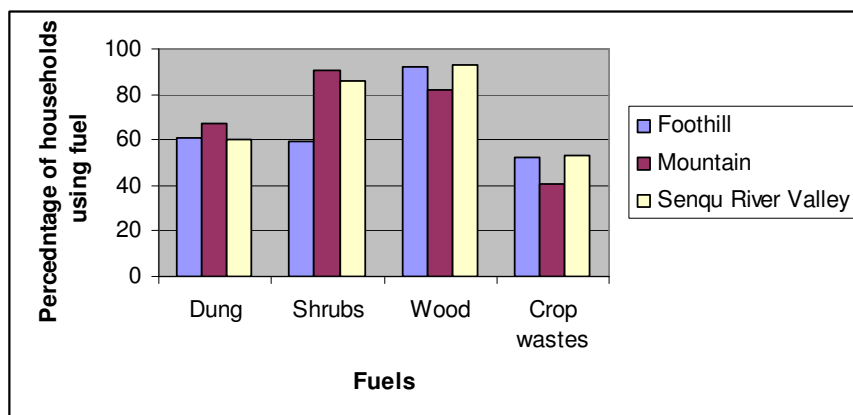
## 5. Energy Use

The following section will outline the results of the data analysis with regard to household energy use. The first section will provide an introduction to fuel use in the specific zones of the study while the second section will analyse the total sample for specific end-uses of energy carriers.

## 5.1 Summary of energy use per ecological zone

Biomass fuel use was high in all three ecological zones. The Foothills had the lowest percentage for shrub use (59%); while the Mountain zone had the lowest percentages for both wood (82%) and crop residue (41%) use. The Senqu River Valley had the lowest percentage of households using dung (60%). The Mountain zone had the highest percentage both for shrubs (91%) and dung use (67%). Wood and crop waste use was used by the highest percentage of households in the Senqu River Valley at 93% and 53% respectively. The percentage of households using each biomass fuel per zone is illustrated in Figure 17, below:

**Figure 17: Biomass fuel use per zone**



In all areas from a specific fuel point of view, the highest percentage of households used wood (89%), followed by shrubs (77%), then dung (63%) and crop residues (49%). Although there are differences in the number of households using various biomass fuels per area, the difference is not remarkable with the only possible exception of shrub use being significantly lower in the Foothill zone than in the Mountain and Senqu River Valley zone, as illustrated in Table 3, below. The data suggests fairly similar levels of biomass fuel use per area.

**Table 3: Biomass fuel use per ecological zone**

Zone	% of households using fuel per zone			
	Dung	Shrubs	Wood	Crop wastes
Foothill	61	59	92	52
Mountain	67	91	82	41
Senqu River Valley	60	86	93	53

A wide variety of commercial fuels were investigated. Paraffin was the most widely used commercial fuel and the Mountain zone had the highest percentage of households using paraffin at 95%, followed by the Foothills at 91% and the Senqu River Valley at 90%. As opposed to paraffin, coal was the least used commercial fuel in all areas – only 2% of households used coal in the Foothills, 1% in the Senqu river Valley and no households used coal in the Mountain villages. The use of commercial fuels per area is summarised in Table 4, below:

**Table 4: Commercial fuel use per ecological zone**

<i>Zone</i>	<i>% of households using fuel per zone</i>							
	<b>Coal</b>	<b>Paraffin</b>	<b>Gas</b>	<b>Solar</b>	<b>Candles</b>	<b>Genset</b>	<b>Car Battery</b>	<b>Dry Cell Batteries</b>
Foothill	2	91	32	8	89	2	18	31
Mountain	0	95	13	4	91	1	13	26
Senqu River Valley	1	90	27	16	91	5	16	37

The level of commercial fuel use often indicates the relative wealth of a household or an area – there is disposable income available to spend on commercial fuel sources. Again, it is difficult to conclude, on the basis of the level of commercial fuel use per zone, if one area is significantly better off than another. In terms of the more expensive commercial fuels such as solar systems, Gensets and dry cell batteries, the percentage of households using these fuels is the highest in the Senqu River Valley, while other expensive commercial fuels such as gas and car batteries are more widely used in the Foothills. In general, the variety of commercial fuels used in the Mountain zone is less than in the other ecological zones, most possibly because of lower levels of disposable income as well as lower availability of commercial fuels. However, to conclude that access to commercial fuels in the Mountain zone is limited would not be supported by the data, since both paraffin and candles are used by the most households in the Mountain zone (95% and 91% respectively), as compared to the other areas (see Table 4, above). The lower levels of gas and other more expensive commercial fuels in the Mountain zone is possibly more a problem of affordability than of accessibility.

The following section will provide information based on the analysis of the entire sample.

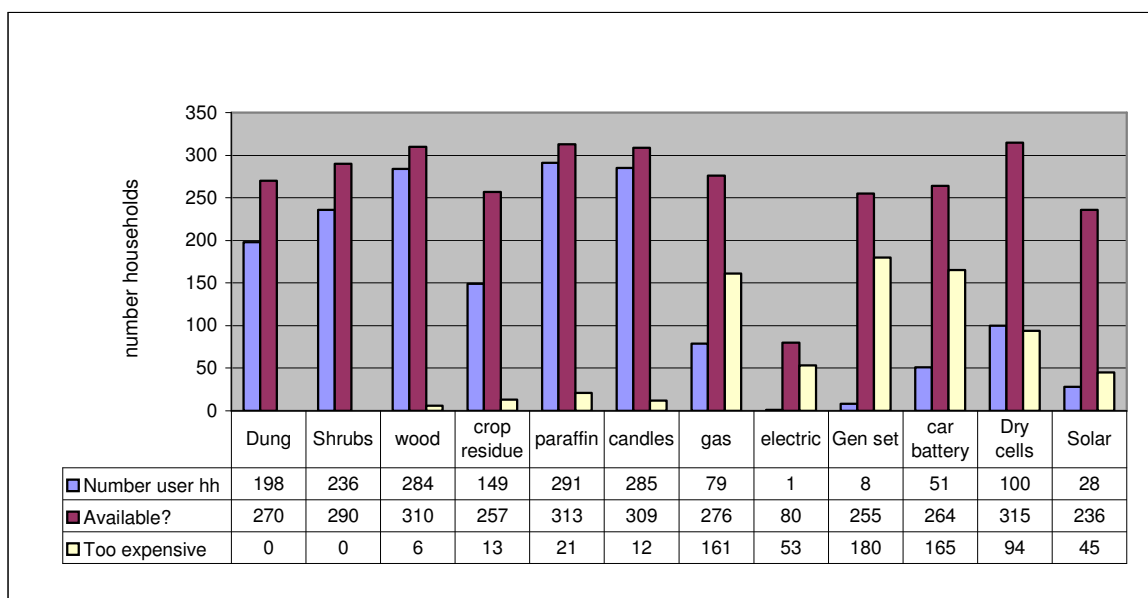
## 5.2 Domestic fuel use for all purposes

Figure 18 below, shows the number of user households for different energy carriers as well as the household's perception of the affordability and availability of the fuel.

Paraffin is used in practically all households, followed by wood, shrubs, dung and crop residues. It should be noted that this does not imply that paraffin is the leading energy carrier in terms of use rate or consumption (see the following paragraphs on fuel use for different purposes).

Respondents noted that all energy carriers are available – with the notable exception of electricity. However, concerning prices, there is a divide between fossil and renewable fuels. A small number of households considers wood and crop residue too expensive (in the case of households buying fossil fuels). Practically all fossil fuels are considered too expensive by all households.

**Figure 18: Number of households using different fuels**



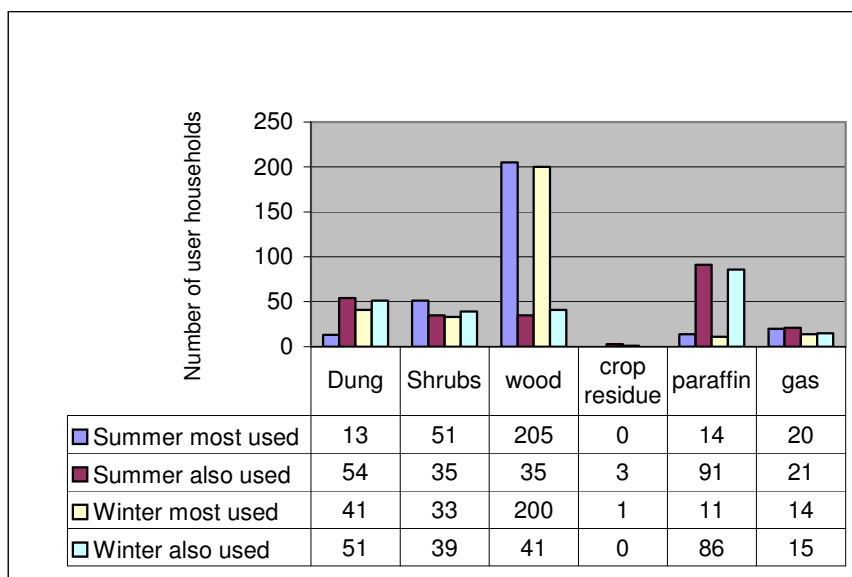
Note on the inclusion of electricity in the figure above: One household (number 177) in the village of Masemousu (Foothills) indicated that they were using electricity. However, the household also indicated that they are using a solar system, which would explain their response. In total, 80 households did not tick the “electricity not available” button, showing up in the figure therefore as 80 households indicating that it is available.

All energy carriers are available – except electricity. Practically all commercial fuels are too expensive.

### 5.3 Cooking fuel use

Figure 19 shows the number of households using different fuels for cooking, both in summer and in winter. The fuels are sorted in the most used and in the also-used” (most used secondary fuel) categories.

**Figure 19: Cooking fuel use**



The typical household in the study areas cooks mainly with wood, complemented by paraffin. A minority uses dung, shrubs or gas as main and as complementary fuel.

The picture in Figure 20 illustrates a typical cooking fire – the energy source is wood, the fire is made outside, visible smoke is present and the cooking pot is a typical three-legged African cast-iron cooking pot.

**Figure 20: Pot cooking on open fire – typical cooking method**



One household in the village of Tsolo in the Mashai area reported to be using an improved cookstove. The stove is illustrated inFigure 21:



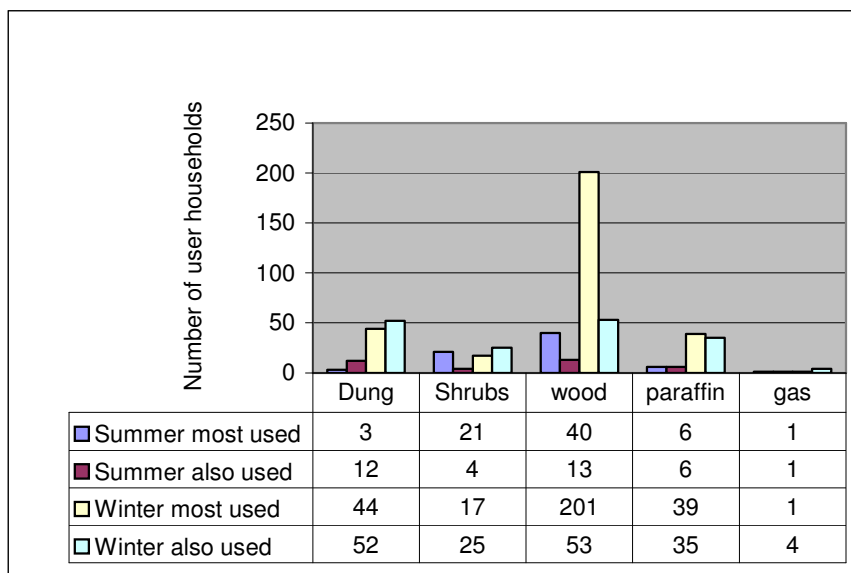
**Figure 21: Improved cook stove**



#### 5.4 Space heating

Space heating is dominated by wood: 254 households reportedly use wood for space heating in winter. Dung, shrubs and paraffin use for heating is marginal, as is heating in summer. Fuels used for space heating and their seasonal uses are illustrated in Figure 22, below:

**Figure 22: Space heating fuel use**

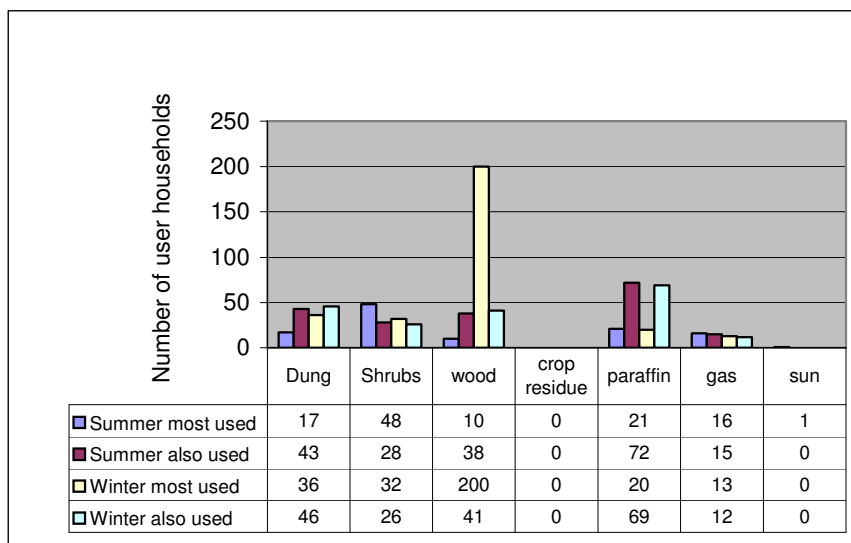


Most households use wood for space heating in winter. Dung, shrubs and paraffin use for heating is marginal. Commercial fuels such as paraffin and gas is not widely used for space heating purposes although more paraffin is used than gas.

## 5.5 Water heating

The main water heating fuel is wood in winter, followed by paraffin, as illustrated in Figure 23 below. In summer, water heating is less important than in winter. Summer water heating fuels are paraffin, shrubs, dung, followed by wood and gas. One household reported the use of solar energy for water heating in summer.

**Figure 23: Water heating fuel use**

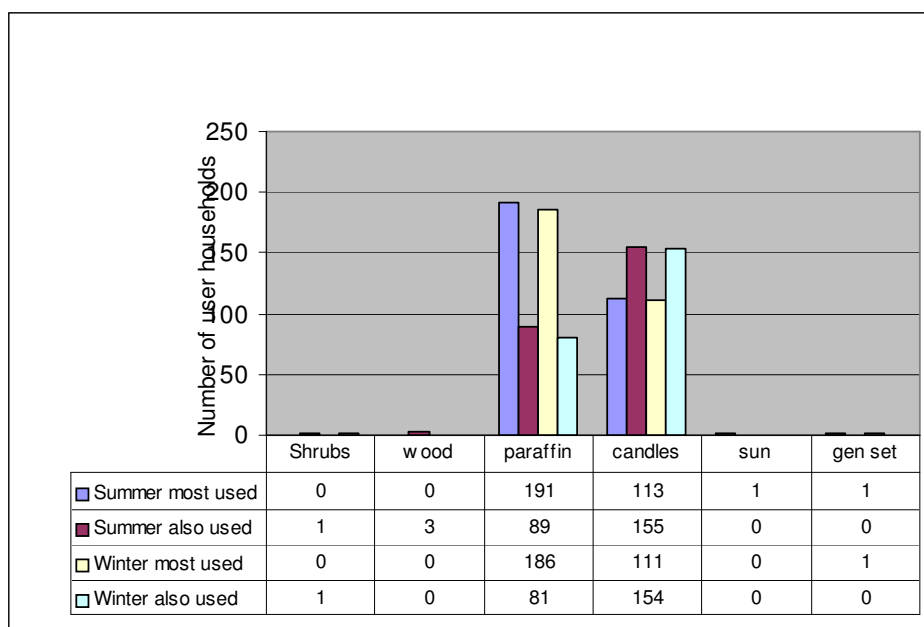


Main water heating season is winter, with wood, followed by paraffin. In summer, some marginal water heating is done using paraffin, shrubs, dung, wood and gas.

## 5.5 Lighting

Lighting is important all year round, with almost exclusive use of paraffin as primary fuel and candles as secondary fuel.

**Figure 24: Lighting fuels use**



Main lighting fuels are paraffin and candles.

A small number of households (around one percent (1%), reported owning solar systems with which they charged batteries used for lighting, powering televisions and radios as well as cell phone chargers. The owner of a solar panel is depicted in Figure 25, below. The household appears affluent, based on the building material and style of the house.

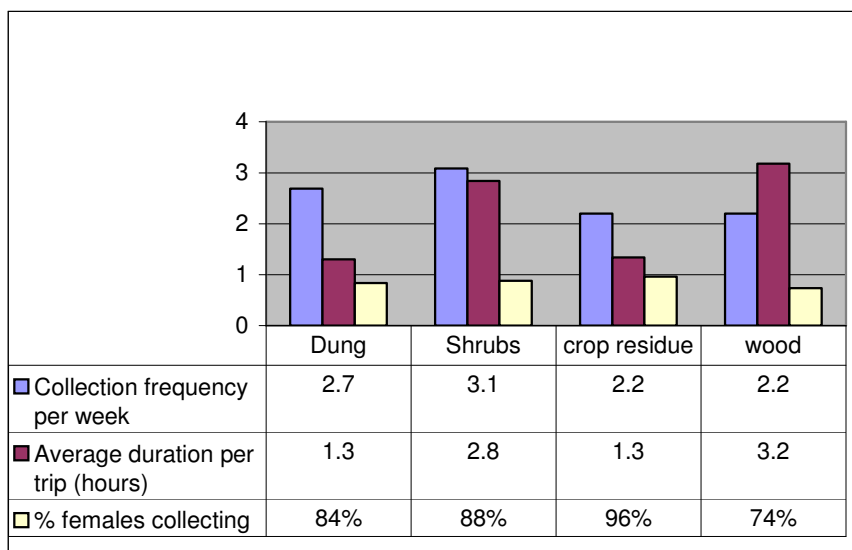
Figure 25: Solar panel used for battery charging and lighting



## 5.6 Fuel collection

Figure 26 shows how often non-commercial fuels are collected, how long an average collection trip takes, and what part of the collection trips are done by women. Between 2 and 3 trips a week are undertaken. Dung and crop residue take around one hour, shrubs and wood around 3 hours per trip, resulting in a weekly collection time of between 3 and 9 hours. Fuel collection remains a female activity. The timid male intrusion into wood collection lends credibility to the idea that males get involved as soon as monetary values of fuels increase, which is the case for wood.

**Figure 26: Fuel collection data in times per week, duration of trip and gender of collector**



Between 2 and 3 trips a week are undertaken to collect fuel. Weekly collection times are between 3 and 9 hours. Fuel collection remains a female activity.

A typical headload of woodfuel collected on a weekly trip is illustrated in Figure 27, below:

**Figure 27: Headload, wood collection**



Figure 28 and Figure 29, below shows wood and dung ready for use at a household:



**Figure 28: Wood stacked**



**Figure 29: Dung stacked for drying**





## 5.7 Fuel consumption data

The preceding sections presented information on the *number of households* using specific fuels, for different purposes. The following section deals with the *amounts and prices* of the different fuels used per household. The consumption data were generated by asking users to put aside, for each carrier, the amount of fuel used per day. The amounts put aside were weighed with a scale and the weight recorded. Table 5 summerises the recordings made.

**Table 5: Cooking fuel consumption**

Use mode >	combined use		single use	
Fuel type v	kg/household d	MJ/household d	kg/household d	MJ/household d
Wood	4,08	61,2	6,2	92,6
Dung	1,52	22,8	4,4	65,7
Shrubs	2,31	34,7	5,6	83,4
Crop residues	0,40	6,0	5,5	82,5
Gas	0,046	2,3	0,3	15,0
Paraffin	0,12	6	1,0	47,5
Total bio	8,31	124,7		
Total fossil	0,166	8,3		
Total all fuels	-	133,0		

Two types of results were obtained:

- “Combined use”, i.e. the average use of each fuel type for all households - this includes use of different fuels (“fuel mixing”) by households. Combined use describes the importance of each fuel in a sample of households: first place is taken by wood, followed by shrubs, dung, crop, paraffin and gas.
- “Single use”, i.e. the fuel use (type and quantity) of single-fuel households only. Single use describes the actual consumption of each fuel in households only using the respective fuel type: first place is taken by wood, followed by shrubs, crop, dung, paraffin and gas.

As can be expected, single use consumptions for a given carrier are higher than the corresponding combined use consumptions. Differences between single use and combined use data can be expected for secondary fuels. This is coherent with the data for paraffin and crop residues.

As for the comparison between fossil and bio-fuel single use, bio-fuel households burn between 4 and 6 kg of fuel per day, fossil fuel users burn between 0.3 to 1 kg per

day. This difference is coherent with the higher efficiency of fossil fuels. Average reported prices were M5.5 per litre of paraffin and M11.4 per kg of gas.

Single fuel households burn between 4 and 6 kg of bio-fuel per day, compared to 0.3 to 1 kg of fossil fuel use. Bio-fuels are dominant for the combined use mode, as well.

## 5.8 Appliance ownership

Table 6 shows the number of households equipped with different thermal appliances. Most owned appliances are open fire, paraffin wick stoves, paola stoves and gas stoves.

On the average, each household owns two thermal appliances.

**Table 6: Stoves owned by households**

Appliance type	Households equipped
Open fire	282
Wood stove	4
Improved stove	5
Coal stove	4
Paola	74
Wick stove	193
Pressure stove	10
Gas stove	71
Total	643
Number of appliances per household	2,0

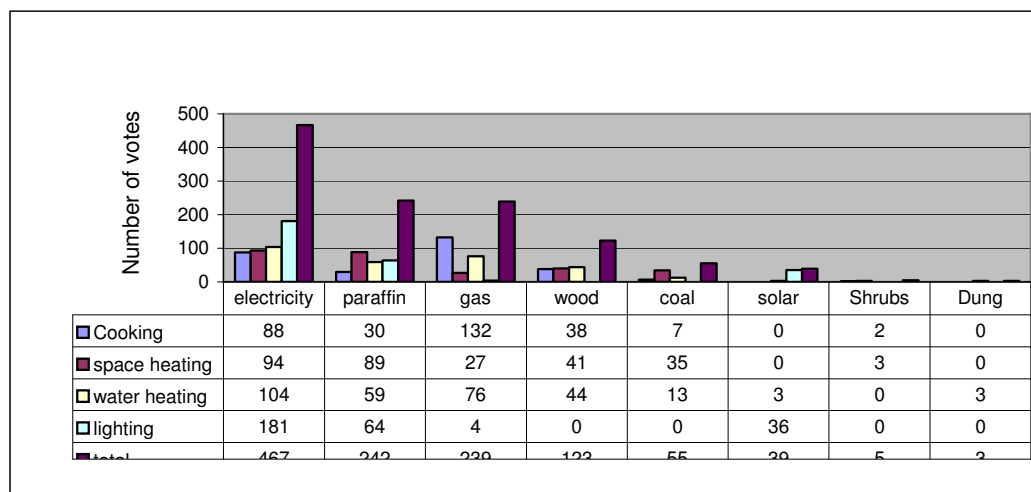
Most owned appliances are open fire, paraffin wick stoves, paola stoves and gas stoves. On the average, each household owns two thermal appliances.

## 5.9 Preferred fuels

Users were asked about their “ideal” fuels (i.e. the fuels they would use if there was complete availability and no problem with affordability). The replies, illustrated in Figure

30 below, show that users would prefer to cook with electricity and gas, to heat their house with gas and electricity, to heat their water with electricity and gas, to light their house with electricity. The relatively low values for solar energy might be partly due to a lack of information on this technology.

**Figure 30: User preference for different energy carriers, independent of price and availability**



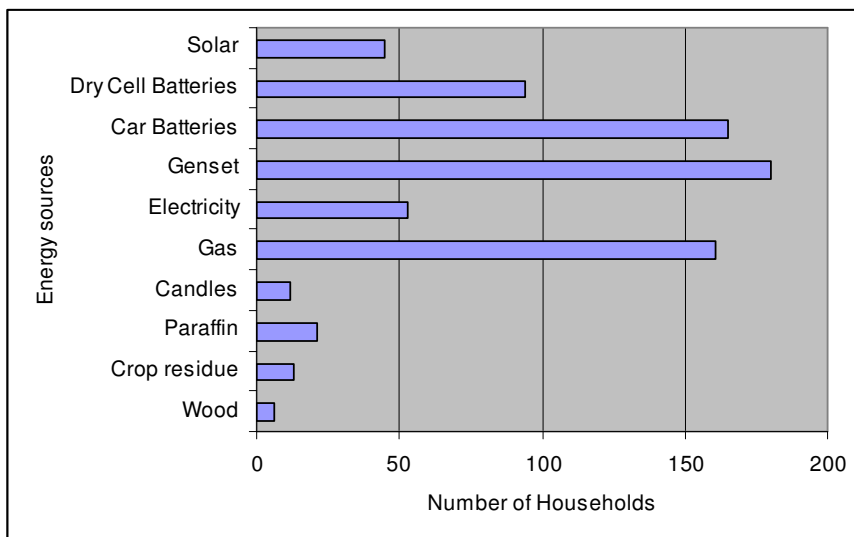
The most preferred energy carrier (electricity) is also the most polyvalent, but also the least available, the most capital intensive and expensive of all modern energy carriers.

Given the free choice, users would prefer to cook with electricity and gas for thermal applications and electricity to light their house.

#### 5.10 Affordability and reliability of fuels

As indicated in section 5.2, all commercial fuels were perceived as being expensive by some households, although more households considered certain fuels expensive. The highest number of households considered gensets, car batteries and gas expensive, as illustrated in Figure 31, below:

**Figure 31: Number of households considering specific fuels expensive**



Interestingly, gas was considered more expensive than solar and even electricity, although lack of experience with regard to electricity may be the cause of the response.

It is clear that households perceive the cleaner sources of energy such as gas, solar and batteries as more expensive than traditional biomass fuels and also paraffin which is considered an environmentally harmful fuel due to its potential health and safety problems. Of non-commercial or biomass fuels, only wood and crop residues were considered expensive by a small number of households (6 and 13 households respectively). In all cases, the households reported being forced to buy the fuels, either because of lack of access to crops and therefore crop residues or physical problems such as age and illness preventing the collection of fire wood. Households collecting biomass fuels did not report expense associated with the fuel, either in terms of collection time or opportunity cost due to lost time that could have been spent on other activities. As concluded in section 5.2, access to fuels did not seem to be the problem experienced by households, but affordability was identified as the main barrier to using fuels other than biomass.

In terms of reliability of fuels, households were not directly questioned on their perceptions of the reliability to fuels. However, some conclusions can be drawn from other responses. For example, some biomass fuels such as dung and crop wastes are used seasonally and availability is therefore restricted during the off-season. Specifically in the Mountain zone, 59% of households reported not using crop residues, also indicating that is not always available. Wood, which emerged as the most used biomass fuel source was not experienced as unavailable by the majority of the sample (98%) but if the average wood fuel collection trip of 3.2 hours twice a week across the sample is considered, it is clear that households, and especially women responsible for collection,

spend a lot of time to secure the energy source. The proposed Energy Strategy will address sustainability of energy supply and demand in more detail.

## **6. Productive use of energy**

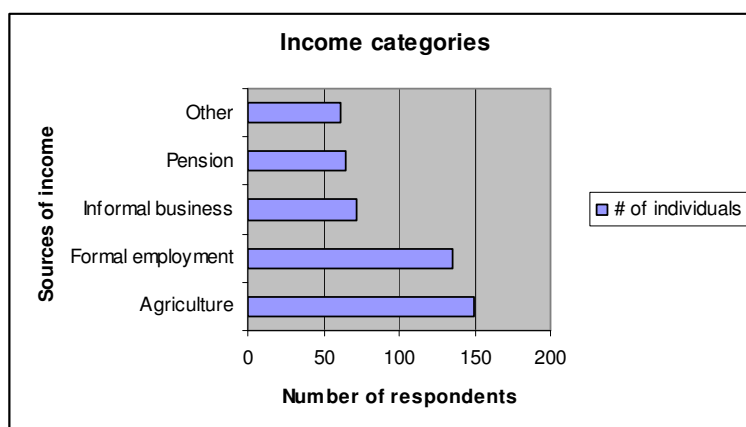
The perceived value of improved access to energy services has evolved significantly over the past decade from an earlier position focusing on a range of quality of life indices (gender, improved health, convenience, etc.) to one that makes a more direct link with income generation and direct economic benefits. Where improved access to energy services translates into income generating opportunities, we are referring to ‘productive use’; the link between energy and income generation.

As part of the Lesotho Energy Access Strategy, the team is required to assess the potential for productive use opportunities being linked to improved access to biomass and other modern, non-grid, energy sources. To do this, we need to develop a portrait of current economic activities, to benchmark the present position, and establish the level of demand for particular goods and services which may in the longer term, translate into further local economic opportunities. Once we have established this, we can then attempt to match local economic opportunities with appropriate (non-grid) energy sources. It should be noted that there are limitations to what economic activities these rural and peri-urban communities can sustain. As mentioned previously in the report, access to these communities is particularly difficult, which places additional costs and uncertainties on the procurement of resources and supplies for the market. In addition, average household incomes are low and incomes at times erratic which will place concomitant pressures on demand.

### **6.1 Current income generating activities**

Households from the sample population derive their income from a range of different sources. A number of different income sources have been clustered together into income ‘categories’, for instance, combining cash-crops, live-stock sales, subsistence farming into ‘Agriculture’. There are five categories of income presented in Clustered income categories, below, namely Agriculture, Formal employment, Informal employment, Pension and ‘Other’ (gifts and/or remittances).

**Figure 32: Clustered income categories**



The graph above depicts the number of individuals deriving earnings from a particular income category. Of the total number of individual respondents (482), slightly over thirty percent (30.1%) derive some income from Agriculture (149), while twenty nine percent (29%) (135) derive an income from formal employment. A fairly similar number of householders rely on the remaining three categories for some income; Informal business (72), Pension (65) and ‘Other’ (61). It should be noted however, that the graph refers to the number of individuals deriving an income from the various categories and not the value of the income itself. Table 7, below illustrates the actual income and average household income for the same group.

**Table 7: Average household income**

Income	# of earners	% of total earners	Total income
0-500 [value = 167]	352	76%	59,000.00
501-1000 [Value = 667]	67	14%	44,666.67
1001-2000 [Value = 1333]	34	7%	45,333.33
2001-3000 [value = 2333]	7	2%	16,333.33
3001-4000 [vau = 3333]	3	1%	10,000.00
4001-5000 [value = 4333]	1	0%	4,333.33
5001-6000 [value = 5333]	1	0%	5,333.33
<b>Total income earners</b>	<b>465</b>	<b>100%</b>	<b>185,000.00</b>
<b>Total HHs</b>			<b>318</b>
<b>Ave. HH income</b>			<b>581.76</b>

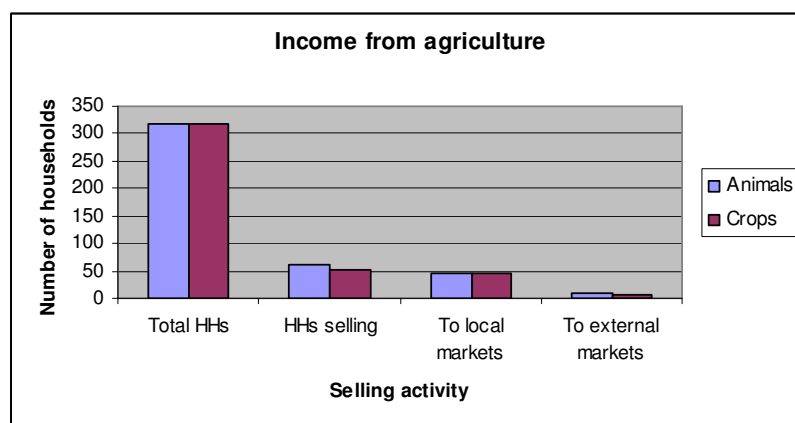
The majority of households earn between M0-M500<sup>1</sup> a month (76%). This is a fairly broad income band and needed to be averaged out at some level. Based on a number of actual incomes recorded on the questionnaires, it was determined that the actual income

<sup>1</sup> The official currency of Lesotho is the Maloti. M1 = R1

is likely to be towards the bottom end of the band. It was therefore determined that the value associated with income bands would be recorded as a third (1/3) of the upper limit of the band<sup>2</sup>. This is a fairly conservative approach but considered to most accurately reflect the poverty observed on the ground.

The average household income for the sample households was 582 Maloti per month. Returning to the sources, we need to examine actual income generating activities to develop a greater understanding of the local economy and future opportunities. The graph below (Figure 33), indicates the number of households engaged in the commercial sale of animals and crops.

**Figure 33: Income from agriculture**



Of the total household sample population, 61 (19%) are involved in commercial animal husbandry while 53 (17%) of households sell crops. While the figures do not gauge the actual extent of these activities they do indicate a level of market activity and future opportunities around developing these markets. The majority of these transactions take place at the level of the local economy with 80% of those households involved indicating that they sell animals/crops locally. Very few transactions (2-3%) are made between the local and external economies<sup>3</sup>.

Of those involved in the sale of agricultural products, approximately sixty percent (60%) claim that the contribution to household income from the sale of such products is either 'Significant but not the principle source of income (25-50%)' or 'More than half of household income'. The remaining 40% of respondent households claim that agriculture makes 'A very small contribution (1-10%)' to household income as illustrated in Table 8.

<sup>2</sup> For example, the actual income associated with households earning between 0-500 would be  $33.33\% \times 500 = 167$  Maloti/month.

<sup>3</sup> The preponderance of local transactions will undoubtedly be influenced by the inaccessibility of external markets.

**Table 8: Agricultural contribution to household income**

<b>Industrial activity contribution to HH income</b>	<b>#</b>	<b>%</b>
# of respondent households	113	100.00%
More than half of HH income	16	14.16%
Significant but not principle source of income	19	16.81%
A very small contribution	78	69.03%

Looking more closely at industry, a number of households are involved in basic manufacture and service industries. The most common household industry is beer brewing with approximately thirty percent (30%) of households deriving some income from this activity. With regard to other activities included in Table 9 below, the number of households involved is considerably less.

**Table 9: Households involved in other income generating activities**

<b>Activity</b>	<b># of HHs</b>	<b>% of HHs</b>
Grass products	10	3.14%
Sewing clothing	25	7.86%
Metal work	4	1.26%
Blocks/bricks	4	1.26%
Carpentry	4	1.26%
Hair dressing	13	4.09%
Beer making	94	29.56%
Shoe repairs	2	0.63%
Traditional healer	1	0.31%
Clay products	1	0.31%

Of those households involved in micro-industrial activities, most consider it a marginal activity in terms of income generation. Indeed, close to seventy percent (70%) of the households that responded to these questions believe that such activities make ‘A very small contribution (1-10%)’ to household income. The remaining thirty percent (30%) of respondents suggested that these activities were more significant to them in terms of contribution to household income. Industry is an important sector where improved energy services can contribute meaningfully. As such, the questionnaire probed levels of energy usage within the household industry sector. The energy input in the various industries is illustrated Table 10, below:



**Table 10: Energy input in income generating activities**

Activity	# of HHs	Energy source					
		Solar PV	Generator	Paraffin	LPG	Woody biomass	Dung
Grass products	10	-	-	-	-	-	-
Sewing clothing	25	1	-	-	-	-	-
Metal work	4	-	3	-	-	-	-
Blocks/bricks	4	-	-	-	-	-	-
Carpentry	4	-	-	-	-	-	-
Hair dressing	13	-	-	-	1	1	-
Beer making	94	-	-	1	1	86	6
Shoe repairs	2						
Traditional healer	1						
Clay products	1						1

Not surprisingly, the production of beer accounted for most instances of household industries using energy in their processes. All households involved in beer production use energy in the process with 86 (91%) relying on woody biomass, 6 (6%) relying predominantly on dung and the remaining two (2) households using paraffin and LPG. Other instances of energy use within other micro industrial, manufacturing and service activities were very low with only one (1) household using PV electricity, 3 relying on generators and one other household using LPG for hair-dressing.

Looking at the contribution of these activities to household income (illustrated in Table 11), the picture contrasts quite notably with agriculture as respondents suggest that micro industry does not contribute significantly to household income.

**Table 11: Contribution to household income**

Industrial activity contribution to HH income	#	%
# of respondent households	113	100.00%
More than half of HH income	16	14.16%
Significant but not principle source of income	19	16.81%
A very small contribution	78	69.03%

Approximately 70% of the respondents claim that industrial activities make ‘A very small contribution’ to household while there is a fairly even split between the remaining households where such activities represent a ‘Significant but not principle source of income’ (17%) or ‘More than half of household income’ (14%).

The survey then assessed the challenges faced by micro-enterprises in these rural and peri-urban villages. The most significant challenge was access to finance with approximately 60% of the respondents indicating this as a constraint. Other significant challenges identified include the lack of skills and experience as well as depressed local markets. The challenges facing potential entrepreneurs are illustrated in Table 12, below:

**Table 12: Challenges facing households (entrepreneurial perspective)**

<b>What are the biggest challenges facing HH regarding small business</b>	<b># of respondents</b>	<b>% of total HHs</b>
We cannot get finance	193	60.69%
We do not want to own our own business	8	2.52%
We d not have the right skills & experience	52	16.35%
We tried to run a business but it did not work	44	13.84%
People are too poor to buy from us	54	16.98%
There are not enough people here to support our business	48	15.09%
It is difficult to run a business without electricity	27	8.49%
Lack of transport	20	6.29%
HH Members too old	7	2.20%
Crime	3	0.94%
Too much competition	3	0.94%

While the previous sections viewed the household – from a range of perspectives – as a producer, analysing income generation, the following section looks at the household as a consumer, identifying what goods and services households access and whether these are part of the local economy or located beyond its parameters. This is important to get a broader understanding of households as consumers and, through thus, a better understanding of the kinds of goods and services available as illustrated in Table 13.

**Table 13: Services available and utilised**

<b>Activity</b>	<b>Users</b>		<b>Location</b>			
	<b>Total users</b>	<b>% of HHs</b>	<b>Local</b>	<b>% of users</b>	<b>External</b>	<b>% of users</b>
Electrical repairs	25	8%	17	68%	8	32%
Welding	16	5%	5	31%	11	69%
Carpentry	20	6%	14	70%	6	30%
Sewing	67	21%	54	81%	13	19%
Shoe repairs	120	38%	104	87%	16	13%
Cellular phone re-charging	27	8%	21	78%	6	22%
Car battery recharging	37	12%	29	78%	8	22%
Public phone	50	16%	33	66%	17	34%

While household incomes are low, they do nevertheless procure a range of goods and services. Shoe repairs, sewing and the use of public phones are common services utilised by households. What is interesting is that, with a few exceptions, these services appear to be available within the local economy. This suggests that the local economy can sustain micro-enterprise and, in many instances, such enterprises would benefit from improved energy provisions.

## **8. Conclusions and preliminary recommendations**

In summary, the following conclusions can be drawn from the data:

- The methodology used for quantification of fuel use was a simplified version of the GTZ Kitchen Performance Test. The method provided accurate and reliable data in a time and cost effective manner and the use of the simplified methodology is recommended for household surveys where time and financial constraints prevent a full kitchen performance test to be carried out.
- Household income is generated from formal employment, pensions (R150 per month) as well as cultivation of cash crops. Although a high number of households reported receiving an income, about one third received no regular income at all, while almost half of the remaining households relied on the income of one member.
- The average household income for the sample households was 582 Maloti per month. The figure should be treated with some caution, since households did not stipulate their exact income but indicated income brackets into which they fall.
- Agricultural activities (cash-crops, live-stock sales, subsistence farming) provide income to more than 30% of the sample, indicating a promising a level of market activity and future opportunities around developing these markets.
- Another 30% of the sample generated household income from brewing traditional beer. As the activity requires energy input in the form of wood, shrubs or dung, an opportunity exist to increase energy efficiency in this activity, reducing biomass input required and therefore reducing costs.
- Household incomes procure a range of goods and services such as shoe repairs, sewing and the use of public phones, mostly in the local economy. This suggests that the local economy can sustain a reasonable level of micro-enterprise and, in many instances, such enterprises would benefit from improved energy provisions.
- All energy carriers are available in the sampled areas, except electricity. Practically all commercial fuels are considered too expensive.
- For thermal end-uses, the typical household in the study areas cooks mainly with wood, complemented by some paraffin. A minority uses dung, shrubs or gas as main and as complementary fuel. Most households use wood for space heating in winter. Dung, shrubs and paraffin use for heating is marginal. Most households reported heating water mainly in winter, and with wood, followed by paraffin. In summer, some marginal water heating uses paraffin, shrubs, dung, followed by wood and gas.
- In terms of lighting, households use paraffin and secondly candles.

- Given the free choice, users would prefer to cook with electricity and gas, for thermal applications and electricity to light their house.
- In terms of fuel collection, households undertake between 2 and 3 trips a week to collect fuel and weekly collection times are between 3 and 9 hours. Fuel collection remains a female activity. Shrubs are most frequently collected, followed by dung and then crop residues and wood. Wood collection trips take the longest.
- Single fuel using households burn between 4 and 6 kg of bio-fuel per day, compared to 0.3 to 1 kg of fossil fuel use. Moreover, bio-fuels are dominant for the combined use mode, as well.
- Most owned appliances are open fire, paraffin wick stoves, paola stoves and gas stoves. On the average, each household owns two thermal appliances.

The following section should be viewed as a broad thematic identification since in-depth recommendations will be formulated with stakeholder input and participation.

- Access and Affordability

The first theme should focus on the issue of access and affordability of fuels. The data indicated that all fuels except electricity were available but that the reason for not using fuels was affordability. Ways of addressing affordability of fuels would for example, include subsidisation. However, subsidies can be very inefficient and a targeted approach would be more effective, for example, providing a subsidy only to vulnerable sections to the target population such as pensioners.

- Improved efficiency for biomass users

Biomass (woodfuel, crop residues and dung) is widely used, both in households as well as for income generating activities such as beer brewing. Introduction of energy efficient cook stoves, kitchen management activities to save woodfuel use and introducing energy efficient stove for beer brewing would be issues to consider.

- Address supply issues of biomass

Biomass availability varied greatly (between 5 minutes collecting time and 8 hours). In some villages, the availability of wood was not experienced as problematic while other areas did experience problems. The high incidence of shrub use also points to a lack of adequate woodfuel. Co-ordinated programmes of tree planting, agro-forestry and community wood lots should be investigated to increase and secure the supply of woodfuel.

- Impact verification of energy policy options through the use of “pioneer groups”

It is recommended that the impact of the strategy to achieve identified energy policy objectives be monitored through the use of pioneer groups (small pilot projects). This would check the perception, acceptance and feasibility under real-life circumstances.

### Reliability

To meet the requirement of the objective of the project it is very important gather data and discuss reliability of the existing energy carriers. It is evident that cattle number is declining in the country due to factors like stock theft, etc. meaning there not going to be as much dung in few years; land degradation through soil erosion, wild fires, etc. is still on the incline imposing stress (shortage) on wood and shrubs usage. Even the rate of growth of these plants compared the rate of use may not be sustainable. To have a relevant and responsive strategy to need of the people in the rural areas, reliability is important.

**Formatted:** Font: Bold

## Appendix A

### Structured Questionnaire



Energy

Department of  
Private Bag A 91  
Maseru 100  
Lesotho

2007

## LESOTHO

Questionnaire Number: \_\_\_\_\_

Interviewer: \_\_\_\_\_

### A. HOUSEHOLD CHARACTERISTICS

#### 1. District

Thaba-Tseka	Mafeteng	Berea	Mohale's Hoek

#### 2. Zone

Mountain	Foothill	Senqu river Valley

#### 3. Area

Mashai	Masemousu	Makhoroana	Shalane

4. Village Name: .....

5. Access to road leading to villages Easy: ☐ Difficult ☐ Very difficult ☐

6. Chief/Headman: .....

7. Respondent Name: ..... Sex: Male: ☐ Sex Female: ☐

### 8. Household profile

No.	Names of Household Members (Starting with the Household Head)	Age	Sex	Educational Level Attained	Main occupation for those 10 yrs & above	Source of income (starting with HH head)	Income in Maloti per month Indicate An amount
1	2	3	4	5	6	7	8
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
		Enter age in completed years if age is less than 1 enter 00	M=Male F=Female	00=Not applicable 01=No formal education 02=Std 1-7 03=Form A – C 04= LPTC/equiv. 05=Form D –E 06=Post COSC 07=Technical/Vocational 08=Degree or Higher 09= Other (specify).....	00=Not applicable 01=Employer 02=Own account worker/Self Employ 03=Unpaid family worker 04=Wage/Salary earner 05=Casual Worker 06=Unemployed 07=Student 08= Pensioner 09= Housewife 10=Other (specify).....	01=Subsistence farming 02=Cash crop 03= Livestock 04=Livestock products 05=Mine Remittance 06=Wage/Salary earner 07= Informal Business 08 = Formal Business 09 = Pension 10 = Other (specify)	01=0-500 02=501-1000 03=1001-2000 04=2001-3000 05=3001-4000 06=4001-5000 07=5001-6000 08=6000+

### B: SOCIO-ECONOMIC INFORMATION

9. Number of people who eat the family's main meal together every day? \_\_\_\_\_

10. How many household members earn a regular income? \_\_\_\_\_

### C: ENERGY USE: Please tell us about the fuels you use

11. Which fuels do you use in your household:

	Yes	No	If not using, why?			
Fuel	Yes	No	Not sold	Too expensive	Not available	Other- Please specify
1. Dung						
2. Shrubs and bushes						
3. Wood						
4. Crop residues						
5. Coal						



6. Paraffin						
7. LPG (Gas)						
8. Electricity						
9. Solar						
10. Candles						
11. Diesel Genset						
13. Car Battery						
14. Dry cell batteries						
15. Others (please specify)						

12. Which fuel do you use the most for cooking, lighting, space heating and water heating?

SUMMER			WINTER	
Fuel used for	Most Used	Other Fuels	Most Used	Other Fuels
Cooking				
Lighting				
Space heating				
Water heating				

13. Please tell us how much energy you use for **COOKING** from the following fuels **per day** (NOTE: Interviewer will ask the cook to put aside the amount of dung, wood and/or coal used in one day for cooking, weigh this on a kitchen scale and record the amount on the questionnaire. For paraffin, ask to pour out the amount into a measuring jug, record the millilitres on the questionnaire, for gas record the size of the gas bottle and ask the cook how long the gas lasts)

Fuel	Measurement per day	
Dung		
Wood		
Shrubs		
Crop residues		
Coal		
Paraffin		
Gas	Size of gas bottle:	How long does it last (days):

14. If you could choose any fuel for cooking, space heating, water heating & lighting, without worrying about the cost or availability of the fuel, what would it be and why?

Application	Preferred Fuel	Why
Cooking		
Space Heating		
Water heating		
Lighting		

15. For the fuels that you collect and/or buy, how long does it take and how far do you have to walk?

Fuel	How often collected/bought per week	How much do you spend when you buy the fuel	How long does one trip take you (leaving home, collecting, back home)	Who collects the fuel (gender and age)	
				Gender	Age

Dung					
Shrubs and bushes					
Wood - collected					
Wood - bought					
Crop residues					
Coal					
Paraffin					
LPG (Gas)					
Electricity					
Diesel					
Petrol					
Car battery					
Dry cell batteries					
Others (please specify)					

16. Please tell us what type of stoves or cookers you use to prepare your food:

Type of Cooker	Yes	No	Most often used for breakfast	Most often used for lunch	Most often used for dinner
Open fire					
Wood stove					
Improved wood stove					
Coal stove					
Paola					
Paraffin stove (flame/wick)					
Paraffin stove (pressure)					
Gas stove					
Electric Stove					
Others (please specify)					

## D. ECONOMIC ACTIVITY

### Agriculture

17. Does the household ever sell any animals or crops? If so, to whom does the household sell animals/crops?

	Yes	No		Yes	No
Does the household sell animals?			Does the household sell crops		
To people from the local villages?			To people from the local villages?		
To businesses in the larger commercial centres?			To businesses in the larger commercial centres?		

18. Are cattle kept at home or are they grazing? Home ☐ Grazing ☐

19. Is there adequate grazing for the animals all year round? If no, please explain what measures are taken to feed the animals when there is insufficient grazing.

Yes	
No	Measures taken?

20. What kind of contribution do these activities (animal husbandry/growing crops) make to household income?  
Please select the most appropriate box.

More than half of household income	
Significant but not the principal source of income (between 25-50%)	
A very small contribution (1-10%)	

**E: HOUSEHOLD INDUSTRY**

21. Does the household manufacture/produce any products for sale or provide any services? Please indicate which energy sources are used.

Activity	Yes/No	What energy source is used? (if any)
Grass products (mats, baskets, etc.)		
Sewing (clothing, etc.)		
Metal work		
Blocks/bricks		
Carpentry/wood carving		
Charcoal		
Hair dressing		
Beer making		
Other (please describe)		

22. What kind of contribution do these activities make to household income?

	Tick one
More than half of household income	
Significant but not the principle source of income (between 25-50%)	
A very small contribution (1-10%)	

23. What are the biggest challenges facing households which do or would like to run small businesses? Please select the most important reasons

Options	Response (tick)
We cannot get finance	
We do not want to own our own business	
We do not have the right skills or experience to run our own business	
We tried to run a business but it did not work	
The people are too poor to buy from us	
There are not enough people here to support our business	
It is difficult to run a business without electricity	
Other (please explain)	

**F: SERVICES**

24. Which of the following services have you used in the past 12 months? Please record 'Yes' in the appropriate column depending where the respondent made use of the service (either 'locally' – in the village, or 'externally' in a larger town.)

	Yes	No		
Service type			Locally	Externally (Where)
Electrical repairs (Radio, HiFi, TV, etc.)				
Welding				
Carpentry (cupboards, Doors, etc.)				
Sewing				

Shoe repairs				
Cellular phone recharging				
Car battery recharging				
Public phone				

Interviewer

comments:\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Serial No.	Names of Household Members (Starting with the Household Head)	Age	Sex	Educational Level Attained	Main occupation for those 10 yrs & above	Source of income (starting with HH head)	Income in Maloti per month Indicate An amount
1	2	3	4	5	6	7	8
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
		Enter age in completed years if age is less than 1 enter 00	M=Male F=Female	00=Not applicable 01=No formal education 02=Std 1-7 03=Form A – C 04= LPTC/equiv. 05=Form D –E 06=Post COSC 07=Technical/Vocational 08=Degree or Higher 09= Other (specify).....	00=Not applicable 01=Employer 02=Own account worker/Self Employ 03=Unpaid family worker 04=Wage/Salary earner 05=Casual Worker 06=Unemployed 07=Student 08= Pensioner 09= Housewife 10=Other (specify).....	01=Subsistence farming 02=Cash crop 03= Livestock 04=Livestock products 05=Mine Remittance 06=Wage/Salary earner 07= Informal Business 08 = Formal Business 09 = Pension 10 = Other (specify)	01=0-500 02=501-1000 03=1001-2000 04=2001-3000 05=3001-4000 06=4001-5000 07=5001-6000 08=6000+