The dream of grid-electricity
- A study on energy use in Mpharane

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TietgenSkolen

Content

List of abbreviations

DME Department of Minerals and Energy

DOE Department of Energy

IDP Integrated Development Plan

INEP Integrated National Electrification Programme

MLM Matatiele Local Municipality

QM Queen's Mercy

SLF Sustainable Livelihood Framework

Acknowledgement

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Thank you.

The Energy Group

Abstract

Despite great political effort the energy situation in South Africa is still scared by the apartheid legacy, and today 3,4 million households in South Africa are still waiting to get provided with grid-electricity. Some of these are the inhabitants of Mpharane. This fact makes us wonder what the reasons are for Mpharane not being supplied with grid-electricity and what the influences of grid-electricity potentially could have on the livelihood of the inhabitants?

By applying The Sustainable Livelihoods Framework this report investigates the role grid-electrification related structures and processes play in the vulnerability context of the population of Mpharane and analyses the potential influences grid-electricity can have on the livelihoods of the inhabitants.

Empirical data is collected in Mpharane as well as in the neighboring grid-electrified village Queen's Mercy and analysed upon in order to elucidate structures and processes influencing the electrification process in Mpharane and possible influences of an installation of grid-electricity in terms of the affect on the human, financial, social and natural capitals.

We find that national processes and structures seem to overrule local plans for development leaving the community of Mpharane highly dependent on decision making at the national sphere of government on which they have very little influence. Even though trends within this sphere outwardly seem to move in the right direction, stating an aim of universal electrification in South Africa, various agendas have resulted in the impediment of access to electricity for many poor areas in the country. Nevertheless it seems that Mpharane will be provided with grid-electricity sometime in the future, and various argument for this to happen can be found within the multiple influences on the livelihoods of the inhabitants.

From this analysis it is possible to conclude that the capital pentagon potentially will be influenced by installation of grid-electricity in terms of reduced energy expenditures, increased inflows of money, decreased health issues and improved learning facilities. Further more security in the area can be improved, though additional initiatives in this regard are required, as an installation of grid-electricity will not bring this on its own.

Key words: *Energy use, grid-electricity, Mpharane, South Africa, Sustainable Livelihoods framework (SLF), perceptions, health, education, economy, wattle, security, structures and processes, Eskom.*

Introduction

South Africa is a country endowed with abundant energy resources and fossil fuels, liquid fuels and gas play a central role in the socio-economic development of the country (DME 1998). But up until the apartheid's final these energy resources and the development of the country had primarily been benefitting the white population of the country, leaving a stark contrast between races and rich and poor (Marquard et al. 2007; Bond 2002; Bekker et al. 2008). The apartheid legacy and the previous policies resulted in a racially determined differentiation in infrastructure provision, including a disparity in access to basic infrastructure and services such as grid-electricity (Bekker et al. 2008).

Interest in energy poverty problems in state agencies began to emerge in the 1980s, although it was continually marginalized in key decision-making structures. The social crisis faced by the apartheid state at the end of the 1980s, coupled with the dramatic political changes occurring in the beginning of the negotiation process, resulted in the rapid formulation of electrification as a definable problem in the beginning of the 1990s (Bekker et al. 2008).
The concept of electrification found a natural ideological home in the ANC and ANC leaders were immediately receptive to the idea of an accelerated programme. The goal of the program was to resolve the problems of 'energy poverty'[1] and promote local economic development by offering universal access to grid-electricity for all households by 2012 (Marquard et al. 2007).

A post-apartheid energy policy framework was drafted, a process that began in 1995 with work commissioned by the University of Cape Town and culminated in December 1998 with the White Paper on Energy Policy (DME1998; Bekker et al. 2008). The White Paper placed significant emphasis on the rural poor and disadvantaged people (DME 1998). Energy should be available to all citizens at an affordable cost. Energy production and distribution should not only be sustainable, but should also lead to improvement of the standard of living for all of the country's citizens (DME 1998).

The National Electrification Programme and the new policies have improved the coverage; since the end of the apartheid in 1994 and up until 2001 the different governments have

[1]Households spending more than 10% of their total monthly household income on energy needs (DOE 2012A)

managed to double the proportion of citizens who have access to grid-electricity from one-third to two-thirds of the population. Thereby the program has had a significant impact on the welfare of most South Africans (Winkler 2005). However, despite great political effort the energy situation in South Africa is still scared by history, and today 3,4 million households in South Africa, especially in the rural areas, are still left without grid-electricity (DOE 2012A). Based on these numbers the goal of the National Electrification Programme has been amended to provide 92% of the households by 2014 with grid-electricity (DOE 2012B).

Matatiele Local Municipality (MLM) is located in the Eastern Cape Province, which is the province with the highest percentages (22%) of no-access to grid-electricity (DOE 2012A). Although the electrification of households in MLM is ongoing, it is not at the desired pace. According to statistics, it is estimated that 25 % of households in the Matatiele District have no-access to grid-electricity (IDP review 2010/2011). This is a relatively large percentage compared to e.g. the Western and Northern Cape with 1% and 2% respectively (DOE 2012A). Furthermore the backlog for the whole District is 75 % or approximately 95.000 households (IDP review 2010/2011).

The MLM covers an area of 4352 km2 and consists of 26 wards. Within Ward 13 the village Mpharane is located. So far Mpharane has not been supplied with grid-electricity, and only limited levels of electricity are being utilized through alternative E.S such as solar panels and generators. The community has been waiting for years, and now, with the lights from the neighbouring village Queen's Mercy[2] in sight, the demand is explicit and the need is urgent.

We wonder then; what are the reasons for Mpharane not being provided with grid-electricity and what influence would grid-electricity potentially have on the livelihood[3] of the inhabitants? These are some of the questions this report seeks to answer, which in more specific terms provides the report with the following objective:

[2] Going from Matatiele in the direction of Mpharane, Queen's Mercy is the last village before crossing the "border" to Mpharane. Queen's Mercy was provided with grid-electricity in 2011

[3] "A livelihood compromises the capabilities assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base." (Dalal-Clayton, 2003 ; DFID,2000)

The objective

The objective of this report is to investigate the role electrification related structures and processes play in the vulnerability context of the population of Mpharane and to analyse the potential influences grid-electricity can have on the livelihoods in this context.

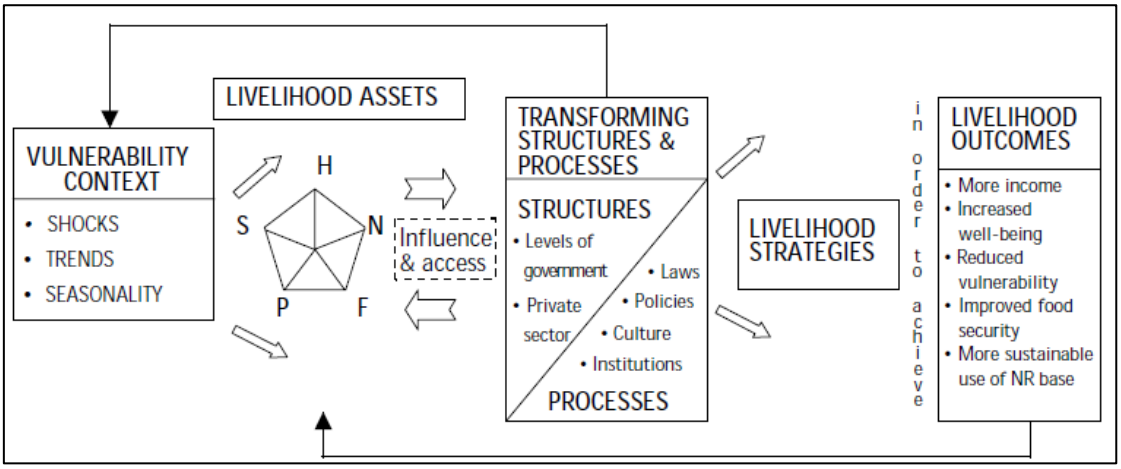
Methodology

Working within a holistic framework of sustainable livelihood we wish to understand the main factors that affect people's livelihood – in this case in relation to the access and limitation of E.S. In order to investigate this, it is essential to acknowledge that the meaning of electricity in itself can be understood in different ways and interpreted by the individual depending on the specific context and social and cultural settings. Therefore, with this constructionist approach we do not seek to find the truth, but wish to map out how the population of Mpharane experiences and understands the meaning of energy and its influence on their livelihood. In order to investigate the perceptions of energy and grid-electricity in Mpharane it is crucial to acknowledge that we are not able to fully rid ourselves from pre-understandings of the field of investigation. However we do strive towards entering the field of research as open minded as possible.

The process of elucidating these research objectives can be seen as a rising spiral involving numerous interactions in which concepts and theories of the social livelihood is derived from the social actors' everyday conceptualisation and understanding (Blaikie 2007). Working within this abductive strategy means that the research takes departure in the collected empirical data, however founded in the theoretical approach of the Sustainable Livelihood Framework (SLF). We are entering the field bearing in mind the different capitals in the livelihood framework (DFID 1999), though also allowing new topics to emerge acknowledging the holistic approach of the framework through the inter-relation between the different contexts and the way they feedback on each other.

The Sustainable Livelihoods Framework (SLF)

Figure 1 The Sustainable Livelihood Framework (DFID 1999)



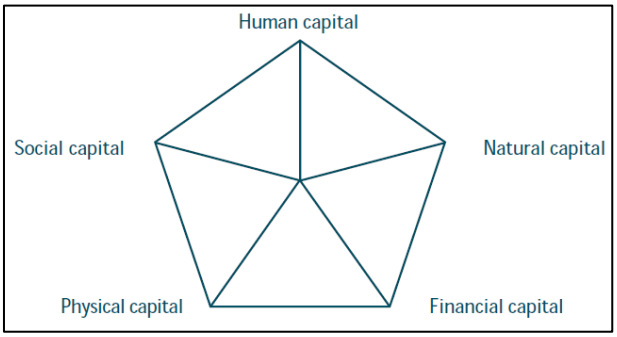
According to the SLF livelihoods are shaped by a multitude of different forces and factors that are themselves constantly shifting. People are viewed as operating in a context of vulnerability (DFID 1999). Within this context, people have access to certain capitals[4] on which the livelihood strategies are based. Grid-electricity is perceived to be an asset within the physical capital. The access to different capitals, such as electricity, and thereby the vulnerability context is highly influenced by trends within the institutional and organizational environment (transforming structures[5] and processes[6]). Based on this, one aim of this research is to elucidate the role electrification related structures and processes play in the vulnerability context of the population of Mpharane. In order to do so it is essential to answer the following research question;

1. **Which structures and processes are influencing the provision of grid-electricity in Mpharane?**

[4] Although the term 'capital' is used, not all the assets are capital stocks in the strict economic sense of the term. The five capitals are perhaps best thought of as livelihood building blocks (DFID 2000)
[5] Both public structures such as political legislative bodies and executive agencies at national, provincial and local level, and private structures such as commercial enterprises and corporations and civil society/memberships organization (DFID 2000)
[6] Policies, legislation and institutions on national, provisional and local level (DFID 2000)

As mentioned, within the vulnerability context people have access to certain assets on which the livelihood strategies are based. The SLF identifies five core capitals upon which livelihoods are built.

Figure 2 The capital pentagon (DFID 2000)



As shown in figure 2 the capitals are inter-related and influencing each other. Based on the literature, the assumption in this research is that access to grid-electricity, seen as an increase physical capital, will alter the shape of the pentagon and thus the livelihood strategies and outcomes in Mpharane, e.g. though an influence on human capital due to improved health and a reduction in time spend on collecting firewood; in social capital as women might no longer go in groups to collect firewood and; in financial capital as new livelihood strategies might increase income generation.

In order to analyse the potential influence of grid-electricity on the livelihood of the inhabitants in Mpharane, this research is aiming to aluminate the current capital pentagon present in Mpharane. This will be done through answering our second research question;

2. **Which energy sources are currently being used and for which household activities?**

Based on the findings in this relation, it will be discussed how the provision of grid-electricity might influence the pentagon and thus the livelihood strategies and outcomes. This is a rather hypothetical discussion, and it will be based on information obtained through answering research question 3.

3. **What are the implications of the current energy sources used, and what are people's perceptions of the influence of grid-electricity?**

Methods

Striving to explore as many aspects of the topic as possible, the study is based on an initial literature approach to the topic, followed by a field study involving qualitative and quantitative methods. In the following section the methods chosen in order to collect empirical data to answer the three research questions are presented.

Transect walk, GPS and GIS

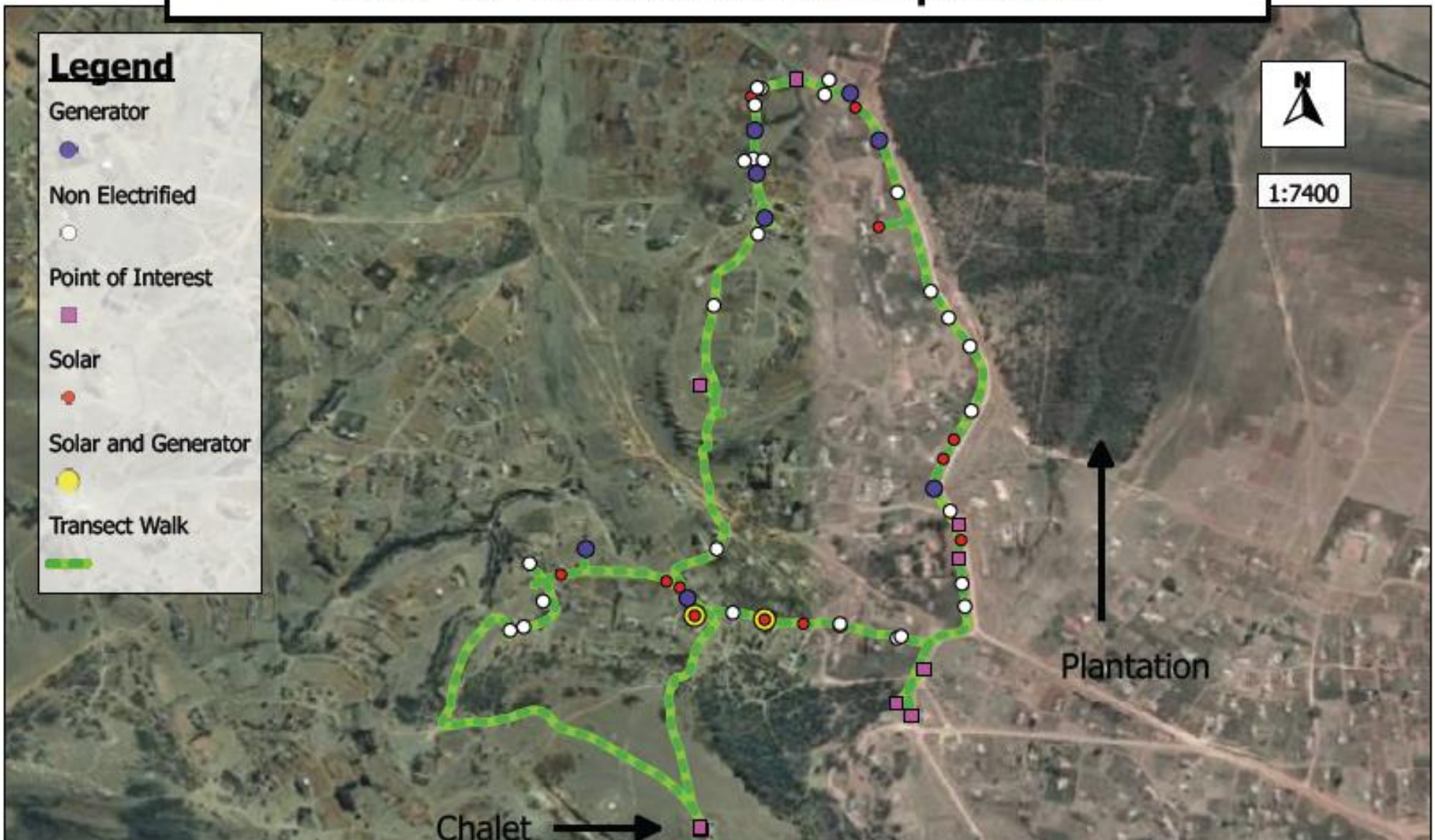
Friday the 1st of March a transect walk of about 6 KM within the sub-village Thababosiu was conducted. The transect walk and observations done during the exercise, is based on information from our key informants and local people with knowledge of the E.S applied in the different households. The aim is to get a first impression of the area and gain preliminary information of the current situation in the village in regards to energy use and sources. A GPS is employed with the purpose of geographically identifying the locations relevant to our investigation. The track of the transect walk is mapped and waypoints are marking households on both sides of the road with or without solar panels and/or generators. The result is shown in Map 1.

The technology employed for the transect walk consists of a GPS set-up, with the UTM projection and map datum WGS84 Navigation-Geo-referencing, a tool employed for mapping based on geo-referenced coordinates of the household examined. The data obtained through this method are downloaded to a computer and analyzed with the software of Quantum GIS.

During the transect walk we get the impression that there is a significantly higher amount of households with solar panels and/or generators than expected. This preliminary conclusion makes us reconsider the study objective as well as sampling strategy and planning of the further research.

Based on the observations done during the walk and the information provided by the interpreter, it seems that Thababosiu contains a reasonable distribution of poor and wealthy households as well as an appropriate distribution of alternative E.S. Based on these assumptions, Thababosiu is chosen as our cluster for sampling and the households within this area are representing the general population. This identified general population will be used further to select respondents for a questionnaire survey and household interviews.

MAP 1. Transect walk in Mpharane



Wealth ranking

A wealth ranking exercise is conducted on the first day of the fieldwork in collaboration with the other groups. This gives us the advantage of not biasing or prompting the results by introducing our group's specific focus on grid-electricity to the participants. The aim is to distinguish levels of wealth in the households of Mpharane through the participants' identified indicators for being respectively a "poor", "medium" or "rich" household (App.1). In addition we use this method to indirectly elucidate the importance of different E.S in the interpretation of being a "rich", "medium" or "poor" household.

We are aware that it is a simplification to evaluate the situation in the community as a whole on behalf of a group of 5 participants and there are some apparent biases in using the selected participant as none of them are from poor households. The results could possibly alter if using people from different socio-economic levels. On the other hand the participants seem to have a great knowledge about the community in general.

The indicators for being categorized as a "poor", a "medium" or a "rich" household defined in the wealth ranking exercise are used in the further research to assess the different households included in the questionnaire surveys conducted in Mpharane and QM. The household categorization is used to analyse differences in energy uses and impacts of grid-electricity according to level of wealth.

Basing the household assessments in QM on the indicators identified in Mpharane is a potential bias. As QM is already provided with grid-electricity, different wealth indicators might be present there. Based on this risk, it would have been appropriate to conduct another wealth ranking with participants from QM. The indicators and thus the household assessments are additionally used to identify participants for the participatory problem ranking.

Questionnaire survey, Mpharane

A questionnaire survey is applied in order to gather standardized information from multiple respondents in relation to the general energy situation and the current use of E.S in Mpharane.

To adapt the questionnaire to the local environment, preliminary information is obtained from the initial key informant interview. Here substantive information on the political,

socioeconomic and cultural environment is given (App.10) and the questionnaire is altered in accordance. A draft questionnaire is then pilot-tested to the key-informant and a local household in order to improve the questionnaire clarity, comprehensiveness and acceptability. Wordings and phrasings are altered and simplified, and numerous sensitive questions are removed. Where close-ended response choices are given, these are based on local information from the initial key informant interview.

The final questionnaire consists of a total of 32 questions, mainly close-ended question, but also open ended questions and follow-up open-ended questions are included (App.20;27). The questionnaire takes approximately 20 minutes to conduct.

Due to limited resources a small sample size of 30 is chosen being aware that this choice will compromise the degree of accuracy (Rea and Parker 2005).

Sampling strategy

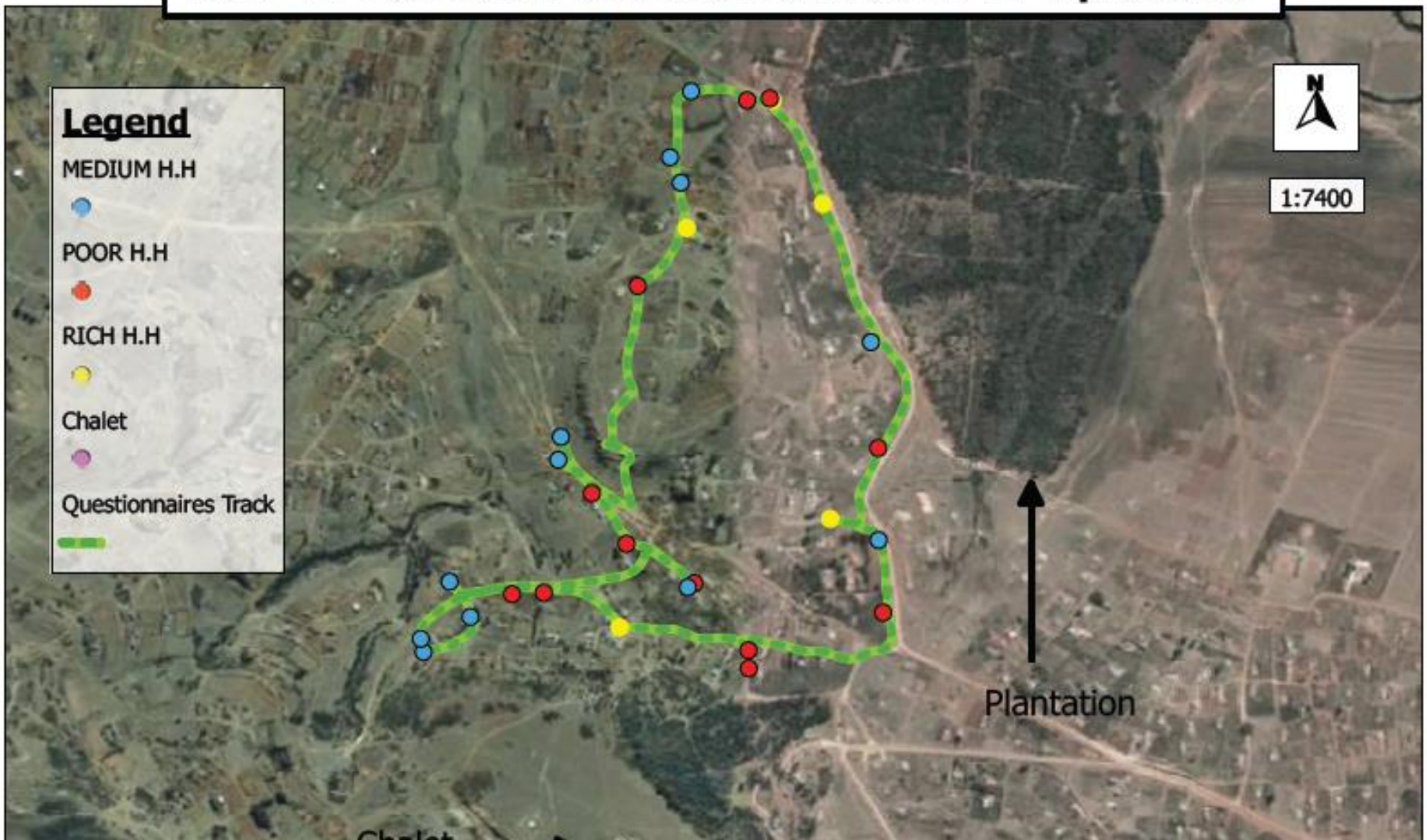
To select respondents a systematic random sampling method is applied. Following the track from the transect walk (App X) each front row house (unit) on each side of the road is included in the working population. The first house on each side of the road is marked as A and 1 respectively. The transect walk consists of 60 households, and therefore, in order to include 30 respondents, we approach every second house along the road, beginning at unit number A and 1. If no respondent is available in this house the one located prior to the original house is approached. If no respondent is available here either the house located ahead of the original house is approached. In order to conduct statistics on the samples the number of 30 respondents is chosen (DePaulo 2000).

Due to absences in several households, the route from the transect walk only covered 24 out of the desired 30 households. Therefore, as shown in Map 2, the route was extended and additional six households were included.

The sample units and their household categorizations are shown in map 2[7].

[7] Due to technical problems, Map 2 only shows 29 units, meaning that one is missing (a rich household).

MAP 2. Questionnaires distribution in Mpharane



The questionnaire survey is conducted by two teams of numerators. Conducting the questionnaire in person in corporation with a translator is time consuming however the advantage is that we have a 100% response rate.

Using a translator means that the exact wording of the questions asked and the answers given is unknown to the numerator, which might influence the validity of the findings. Furthermore the numerators have not been sufficiently strict in getting exact answers to all questions, due to the sensitivity of the situation, which results in insufficiently data obtained on numerous questions, decreasing the validity of the data obtained in the questionnaire surveys.

Questionnaire survey, Queen's Mercy

A short questionnaire survey is conducted with households in QM in order to gather basic information on the average household grid-electricity consumption and expenses. From our questionnaire utilized in Mpharane, we are able to compromise the questionnaire into very specific questions.

Sampling strategy

The respondents are selected using a purposive sampling strategy. Striving for comparable data and maximum variation, households are selected on the basis of the household assessment indicators identified in the wealth ranking exercise in Mpharane. An objective household assessment is conducted before including households in the survey. A total of 12 respondents are included in the survey, representing four of each of the three

Semi-structured and open-ended interviews

During the fieldwork 13 semi-structured and 2 open-ended interviews are conducted of which 7 of the semi-structured are with key-informants selected based on an idea that they can provide us specific, useful information on the different topics.

In addition 6 household interviews, with respectively “poor”, “medium” and “rich” households from both Mpharane and QM are conducted. The categorization of the households is based on the wealth indicators identified in the wealth ranking session in Mpharane.

Sampling strategies

In order to obtain maximum variation in information, respondents for the household interviews are selected using a purposeful sampling strategy. To select participants in Mpharane, the working population consists of respondents who have participated in the questionnaire survey. Based on the household categorization respondents representing “poor”, “average” and “rich” households are invited to participate in the interviews. The household interviews are conducted by two teams of interviewers.

In QM two interviews with a poor and a rich household respectively, are conducted. The households are selected using purposeful sampling.

The two open interviews are conducted by convenience, as we met these two people by chance and decided to obtain information from them (App.4;5).

The aim of conducting household interviews is to obtain understanding and in-depth information regarding current energy use, as well as elucidating perceptions of the importance and potential impact of grid-electricity supply (See App.30 for interview guide). The interview guide for the households in Mpharane is constructed after a participatory observation in a familiar household where power relations are minimized and activities maximized.

The semi-structured interviews are built up around topics in accordance to the research questions. For each interview we have a person in charge of leading the interview whereas the rest are taking notes and supplementing with follow-up questions.

In a reflective hindsight it would have given us more in-depth answers if we had finished one topic at a time with subsequent additional questions from the rest of the interview performing team. One topic would be worked thoroughly through before commencing on another. Additionally, the number of participants present during conductions of interviews

can to some extent be hindering a relaxed atmosphere and creation of trust, which is important when engaging people to talk.

Problem ranking and video interview

In order to have as many different voices from Mpharane sharing their opinions on the most important things that should be improved on a community level, we have strived towards conducting a problem ranking session with a diverse group, representing different household categories, genders and age-groups.

Sampling strategy

The participants are purposely sampled from our questionnaire sample cluster. Two representatives from "poor", "medium" and "rich" households respectively are invited. It is furthermore ensured that the representatives are both men and women.

One of the invited inhabitants from a "rich" household was not showing up. This may influence the collected data since the "rich" are proportionally underrepresented. On the other hand if two "rich households members" have the change of discussing the most burning issues in Mpharane a dominating power relation could occur, positioning the other participants in a more withdrawn and quite position.

After the initial brainstorm on the topics the participants are asked to prioritize the five most important topics in a random order. Finally, in order for the participants not to influence each other and to avoid positioning and power structures to influence the result, the participants are asked to rank the topics individually and anonymously.

Group interview

A group interview in QM is conducted in order to explore the potential impacts of grid-electricity on the livelihoods of the inhabitants.

Sampling strategy

The participants are selected through convenience sampling, i.e. what was made possible by our translator who is a previous inhabitant of Queen's Mercy. Despite having specified to our translator to invite 5-7 participants, 20 people ended up participating (App.6).

One could argue that since so many people show up representing all ages and both genders, we could have positioned us more as moderators instead of interviewer and provoked some discussions and thereby been more open for new topics to arise. If time was not a constraint new appointments could have been made.

Using an interpreter with strong relations to the community turned out to cause some unforeseen issues; the interpreter is not only personally involved in the community, she is also a youngster talking to the older feeling obliged to the cultural norms of respecting the elderly and their time. This we do indeed as well have to respect, yet at the same time not neglecting important information gathering.

Participatory observation

In order to triangulate the findings from interviews and questionnaires we include participatory observation as a method. The observations are done in three families and during two different wattle collection situations (App.17;19;22). In addition to enabling us to obtain a different insight from observing and not just talking and interviewing, we seek to reverse the classical observer-observed role in participating with cooking and collecting firewood and thereby to increase our understanding by getting hands-on knowledge from trying the activities under the insider's instructions and ways of working.

During the participatory observations we found new insights that we didn't gain in the interviews, e.g. that the oxen firewood-collector sold wattle to approximately 20 households and not only gave it to family members.

When utilizing the method of participatory observation, it has to be borne in mind that it is inevitable to rid ourselves from our preconceptions and understanding of the world. This might influence the interpretation of the data.

Analytical methods

This section is intended to clarify the systematization and analysis of the empirical data in relation to the theoretical concept.

Since the reliability of processing the empirical data is essential for the validity of the analysis we strive towards systemizing the empirical data through the work of a transparent coding process that consist of; Coding, Categorisation and Conceptualisation (Halkier 2008).

The data is divided into the three thematic headlines that correlate with the three topics that the research questions of the report are based upon. These being: 1) Structures and Processes; 2) Current Usage; and 3) Implications and perceptions.

We entered the field with categories founded in the secondary literature, these being; Structures and processes, Current usage; Socio-economic aspects in regards to fire wood; Health issues in relation to the current energy use and; Economic factors. During the field research additional three categories emerged, being Education; Security and Job opportunities. The data derived from the different thematic headlines, are color coded into the eight categories.

Through a conceptualization process (Halkier 2008), the above mentioned categories are being placed in relation to the theoretical concepts of the SLF; Vulnerability; Structures and processes and Livelihood strategies and outcomes, with the sub categories of the capital pentagon; Physical, Human, Natural, Financial and Social Capital.

We are thereby able to present the following findings where variations, contrast and paradoxes are being presented in terms of answering the three research questions within this research. Findings are primarily based on data obtained in the field, though the findings related to research question 1, are partly based on a literature research.

In the discussion, our findings will be put into a broader perspective and triangulated with secondary sources, with the aim of strengthening the validity of the findings and to elucidate the objective of this report.

Findings

In order to elucidate the objectives of this research, we firstly investigate which structures and processes influence the electrification process in the village. Further, in order to enable a discussion on how the provision of grid-electricity can influence the current livelihood of the

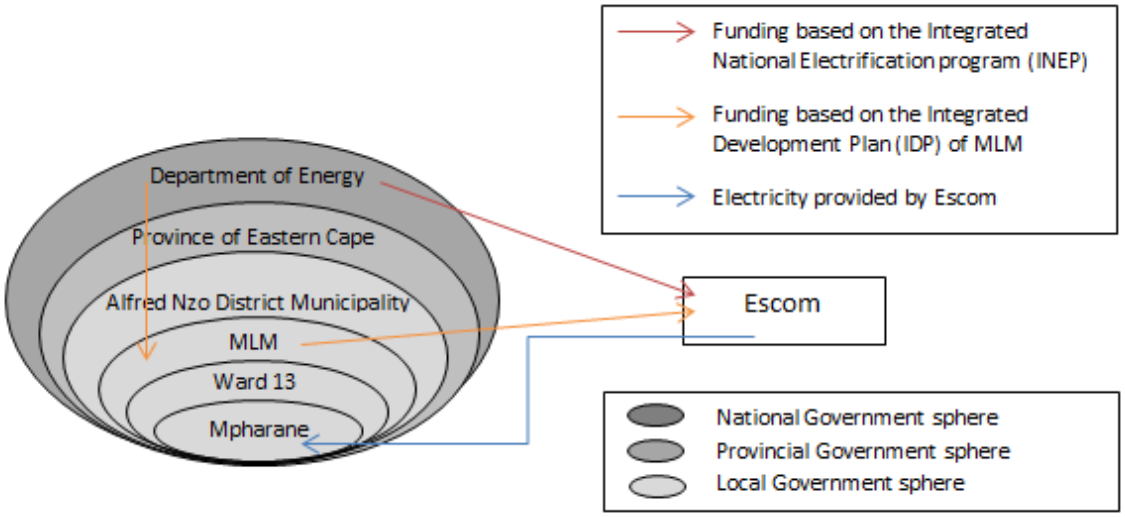
inhabitants of Mpharane, findings in regards to current usage and perception of energy are being presented. Additional information on the demographic is exclusively derived from the survey in Mpharane.

Structures and processes

Influencing forces[8]

In South Africa there are three spheres of government; The National Government, the Provincial Government and the Local government (App.8;11). Based on the interviews it seems that the electrification process is influenced by different structures, both public and private, functioning within different spheres. According to the respondents the structures influencing the access to grid-electricity, are located within all spheres and the processes are dictating the flow of funding within these spheres (App.5;8;11):

Figure 3 Structures and processes influencing the electrification process



As indicated in figure 3 it seems that the electrification process is mainly influenced by structures[9] and processes[10] within the National and Local spheres. This is explained in greater detail in the following textbox.

[8] The complexity of structures and processes, coupled with the fact that no data from the national, provincial and to some extend local level, has been obtained as this research is conducted on a community level, means that the intended depth of this topic has not been reached. Though based on the information provided during the field research, an overall understanding has emerged, which is triangulated with information found in the literature.

[9] The Department of Energy functioning within the National Government, and the Matatiele Local Municipality functioning with in the Local government sphere

[10] The Integrated National Electrification Programme published by the the National Government, and the Intergrated Development Plan developed by the Matatiele Local Municipality (Local Governement shpere)

Processes within the National Government sphere

According to the councilor, the highest authority in the decision-making process regarding grid-electricity is the Department of Energy (DoE) in the National Government. The DoE is funding the electrification of South Africa in accordance to the Integrated National Electrification Programme (INEP), by distributing funds directly to the energy company Escom. Besides that the DoE provides MLM with funding based on the annual Integrated Development Plan (IDP) (App. 8;11).

Processes within the Local Government sphere

The funds provided by the DoE, are distributed within the municipality's wards based on an IDP developed by the municipality. The annual IDP is based on the needs and wishes of the communities within the 26 wards. The local communities' needs are noted by the ward councilor, who then brings his/her ward's priorities forward in a councilor meeting, in which the 26 ward councilors debate, decide and prioritize the needs and projects based hereon (App.11). Based on the priorities, the annual budget has to be divided between the 26 wards.

According to the councilor it is a challenge to prioritize the issues in the different wards, since there are often disagreements in relation to which and where needs are most urgent: *"Electrification is a high priority for most of the ward councilors as not even half of the wards have yet been electrified"* (App.11). When asking the councilor, how the needs for grid-electricity is then agreed on and prioritized, the councilor seems reluctant to answer in details, but the ward secretary contributed to the discussion in a fairly sarcastic tone: *"You have to fight for your matters of interest, but maybe he's too soft this one"*. As a comment on this statement, the councilor argued that it is all a matter of funding. According to the councilor the application for electrification has been an ongoing process since 2000 but as he said: *"We have to wait for funds, but have to keep on fighting"* (App.11).

The councilor informs that prior the two main obstacles in the electrification process have been a shortage of money in the municipality budget and insufficient power production from Eskom's power stations. Since 2008 the latter problem should no longer be an issue, which leaves a shortage of funding as the primary reason for the electric shortcoming (App.5;11).

The school principal informed us that a municipality meeting was held on February 26th. At the meeting it was communicated that; *"all things are ready"* for installation of grid-electricity in regards to the funds from the National Government *"but no one knows where the funds are"*[11] (App.8). When the ward committee approached the municipality in this regards, the blame was thrown at Eskom[12] (Ibid).

When looking in the IDP for MLM 2012/17 it seems that the efforts are finally paying off. In the IDP 2012/17, Mpharane is on the list of villages to be provided with grid-electricity within this period (IDP, 2012). In the document it is not clear exactly when the work is to be commenced, though according to the councilor Mpharane is next in line (App.11). Stated by both the councilor and the ward committee member, the annual budget for 2013/14 has finally been approved, and the process of implementing grid-grid-electricity in Mpharane will commence in July 2013 (App.5;11;12). *"Our time has come - that is why we are so eager!"* (App.5)

Talking to the community in Mpharane it is clear that the villagers have been waiting for grid-electricity for a decade and that promises of supply have been made for just as long. Most of the villagers haven't stopped hoping and they are convinced that now grid-electricity is coming – because once again they have been promised. When asking the respondents in the questionnaire survey if they are expecting Mpharane to be provided with grid-electricity, most inhabitants (90%) confirm. 10 % seems to have lost faith (App.20).

Sitting outside in the burning sun, smoking and listening gospel music from a solar driven radio, 25 year old Mr. Young is asked the question "Are you expecting to be provided with grid-electricity in your village?" he smiles and says

"They have promised us that ever since I was a child. Now I have stopped waiting and hoping for it"

We are provided by information from 28 respondents in regards to when they are expecting to be provided with grid-electricity. 35,7% answer that they don't know when to expect it.

[11]From this interview it is not clear weather this refers to the direct funding from the National Government to Eskom, or the funding provided by the municipality to Eskom according to the IDP.
[12]Indicating that the funds already were provided to Eskom, and that Eskom now is stalling the process for some unknown reason.

35,7% is expecting to have grid-electricity before the end of 2013 and 21,4% is expecting it to happen before the end of 2014 (App.20).

One elderly gentleman says in a sarcastic tone: *"I don´t know when, they are promising all the time. Hopefully before I die!" (App.20).* One respondent answered *"The rumours said July 2013"* (App.20), while another one says, a bit more sceptic, *"2013! The councilor said that, but they have said that before."* (App.20). The uncertainty within the community, seems to be shared by the school principal of the primary school in Mpharane, who is also a member of the ward council. When asking him the question of when he expects to get grid-electricity to the village, he answered that he doesn't know, going on stating the obvious *"it is complicated the way electricity is delivered!"*(App.8)

As indicated in the quotes above, it seems that most of the estimations and expectations are built on rumours and promises from the Ward councilor.

Based on these findings it seems that the 35,7% of the community in Mpharane who stated that they are expecting grid-electricity to be provided before the end of 2014 will have their expectations fulfilled. Unfortunately, reality might be more in favour of the 10%, who have stopped hoping. When trying to confirm the statement of the councilor, the responsible for the Electrical Unit within MLM, Mr**.** Augustin, provided the following information to the research:
"According to the Eskom Electrification programme Mpharane is listed for 2015/2016 financial year. This however is not guaranteed as the programme is already behind because of lack of funding." (App.24)*.* Furthermore, only two of the 13 sub-villages are on Eskom's list of areas to get grid-electricity in Mpharane (App.24).

Within the findings of this research it is confirmed from different stakeholders that the electrification of Mpharane is influenced in several ways and by different structures and processes, and based on the latter finding it seems that the INEP is superior to the IDP of MLM. To further elucidate which structures and processes that influence the electrification of Mpharane, a literature research has been conducted. A brief overview is presented in table 1.

Table 1 Structures and processes influencing the electrification process of Mpharane

Year	Process	Structure	Trend
1994	The Reconstruction and Development Programme	GoSA	Aimed to provide a wide range of basic services, including water, grid-electricity, housing, education and health. Required an accelerated and sustainable National Electrification Programme (NEP) (Bekker et al. 2008)
1996	Constitution of the Republic of South Africa	GoSA	States that municipalities, as a part of their developmental duties, have the responsibility to make sure that all citizens are provided with services to satisfy their basic needs (ANC 1996)
1998	Local Government White Paper of February 1998	DCD	The White Paper endorsed privatization, and municipalities were encouraged to contract out infrastructure-related services, such as electrification, to the private sector (Bond 2002). This meant that the electrification process was directed by marked structures such as supply and demand and marginal costs, which allowed "cherry-picking" (denial of services to the poor).
1998	White Paper on Energy Policy	DMEA	Placed a significant emphasis on the rural poor and disadvantaged people, and allowed moderately subsidized tariffs for poor domestic consumers. Though, the neoliberal influences are also represented within the White Paper, e.g. through the promotion of cost-reflective prices on electricity
2000	The Municipal Systems Act (No.32) of 2000	GoSA	Act to provide for the core principles, mechanisms and processes that are necessary to enable municipalities to move progressively towards the social and economic upliftment of local communities, and ensure universal access to essential services, such as electricity, that are affordable to all. States that a municipality must undertake developmentally-oriented planning.
2012	IDP Matatiele Local Municipality	MLM	Based on The Municipal Systems Act (No.32) of 2000, the MLM is obligated to conduct an annual IDP. IDP is a bottom up approach to development planning on the local level, involving the entire municipality and its citizens in finding the best solutions to achieve good long-term development.

The findings therefore indicate that the history of uncertainty and confusion is to be continued, and that the dream of electrification is in the hands of high level governance on which the community has no real influence.

Demographic information

30 household representatives provide us with demographic information. The findings are presented in Table 2.

Table 2 Demographic information summary

Data	Number of households	Response count	Response percentage
Total number of households	**30**	**30**	
Total number. of people in 30 households[1]	125	30	
Average household size	4,2 (Range; 1 to 11)	30	
Households with school goers	21	30	70
Average monthly income per household	R2242,5 (Range; R400 to R14.200)	21	
Households with income generating activities, incl. salary[2]	18	30	60
Households with older persons grant[3] as the main income	13	28	46
Households with child support[4] as the main income	10	28	35,7

1 Although a definition of household members is given, the number of members might be impresice due to confusion in regards to different peoples affiliation to the household

2 Salery is considered payment from a real job. Income generating activities: e.g. cooking, selling animals, cleaning, washing, selling wattle and tuck shop activities.

3 An older persons grant is paid to people who are 60 years or older. The monthly amount is R1200 per person

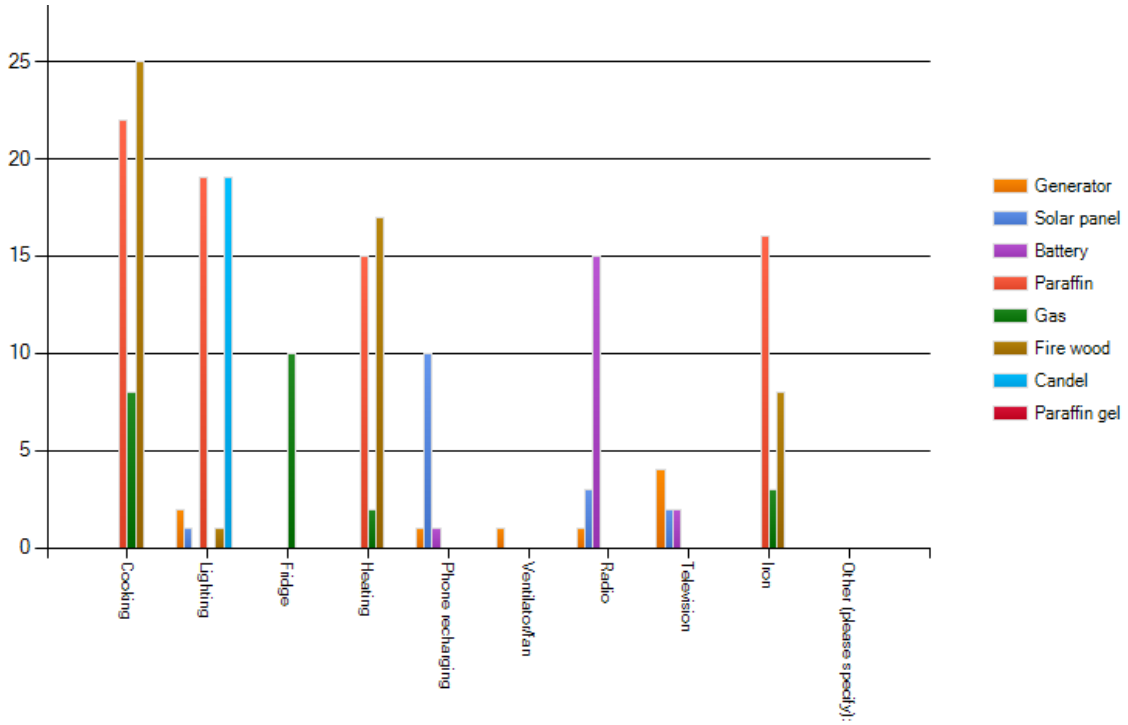
4 Child support is paid to primary caregivers, who is not paid to look after the child. The child must be born after 31 d december 1993. The monthly amount is R280 per child.

There are 21 respondents providing information on household income, showing an average monthly income of R2242,5. However, 20 of the 21 households had a monthly income of or below R5000, resulting in an average income of R1613,2 if not counting the 1 household with an income of R14.200.

Current energy use

Figure 4 shows the applied E.S in relation to household activities for the respondents from Mpharane.

Figure 4 Applied energy sources in relation to household activities, Mpharane



As indicated in figure 4 multiple E.S are being applied for various household activities and it seems that the main E.S for household activities are wood, paraffin and candles. This graph is presented in percentage below in table 3.

Table 3 Applied energy sources in relation to household activities, Mpharane. All numbers are presented as percentage (n = 30)

Answer Options	Generator	Solar panel	Battery	Paraffin	Gas	Fire wood	Candel	Paraffin gel
Cooking	0	0	0	73,3	26,7	83,3	0	0
Lighting	6,7	3,3	0	63,3	0	3,3	63,3	0
Fridge	0	0	0	0	33,3	0	0	0
Heating	0	0	0	50	6,7	56,7	0	0
Phone recharging	3,3	33,3	3,3	0	0	0	0	0
Ventilator/fan	3,3	0	0	0	0	0	0	0
Radio	3,3	10	50	0	0	0	0	0
Television	13,3	6,7	6,7	0	0	0	0	0
Iron	0	0	0	53,3	10	26,7	0	0
Other (please specify):	0	0	0	0	0	0	0	0

Table 4 - Extent of use of different sources and for what activities mainly

Source of energy	**Percentage households using this**	**For what activities mainly**
Wood	96,7%	Cooking, heating
Paraffin	96,7%	Cooking (73%), lighting (63%), heating (52%), ironing
Candles	63%	Lighting
Solar panel	40%	Cell phone charging
Generator	20%	Lighting, cell phone charging, radio, TV

The table below shows the applied energy sources, for poor, medium and rich households in Mpharane.

Answer Options	Rich	%	Medium	%	Poor	%
Cooking						
Generator	0,0		0,0		0,0	
Solar panel	0,0		0,0		0,0	
Battery	0,0		0,0		0,0	
Paraffin	3,0	50,0	10,0	83,3	9,0	75,0
Gas	4,0	66,7	4,0	33,3	0,0	
Fire wood	4,0	66,7	10,0	83,3	11,0	91,7
Candel	0,0		0,0		0,0	
Paraffin gel	0,0		0,0		0,0	
	6,0		12,0		12,0	11,0
Lighting						
Generator	1,0	16,7	1,0	8,3	0,0	
Solar panel	1,0	16,7	0,0	0,0	0,0	
Battery	0,0		0,0	0,0	0,0	
Paraffin	5,0	83,3	9,0	75,0	5,0	41,7
Gas	0,0		0,0	0,0	0,0	0,0
Fire wood	0,0		0,0	0,0	1,0	8,3
Candel	2,0	33,3	7,0	58,3	10,0	83,3
Paraffin gel	0,0		0,0		0,0	
	6,0		12,0		12,0	9,0
	4,0		6,0		0,0	4,0
Heating						
Generator	0,0		0,0		0,0	
Solar panel	0,0		0,0		0,0	
Battery	0,0		0,0		0,0	
Paraffin	5,0	83,3	6,0	50,0	4,0	33,3
Gas	1,0	16,7	1,0	8,3	0,0	
Fire wood	3,0	50,0	5,0	41,7	9,0	75,0
Candel	0,0		0,0		0,0	
Paraffin gel	0,0		0,0		0,0	

When asking the respondents if they were satisfied with the current energy supply, 86,7% answered no. 10% responded that they were satisfied, of which 66,7% added that they accepted the situation.

Table 5 - Reasons for not being satisfied with the lack of electricity

REASONS	PERCENTAGE
Poor cooking facilities and lack of lighting	16,7%
Simply want grid-electricity	16,7%
Acceptance of current situation	16,7%
Lack of security	4,2%
High energy expenditures	8,3%
Food security	8,3%
Problems with collecting wood	8,3%
Lack of job opportunities	4,2%

In QM 12 questionnaires were conducted. Figure 5 shows the results for the question *"What E.S do you use for the following activities?*

Figure 5 Applied energy sources in relation to household actitivites, Queen's Mercy

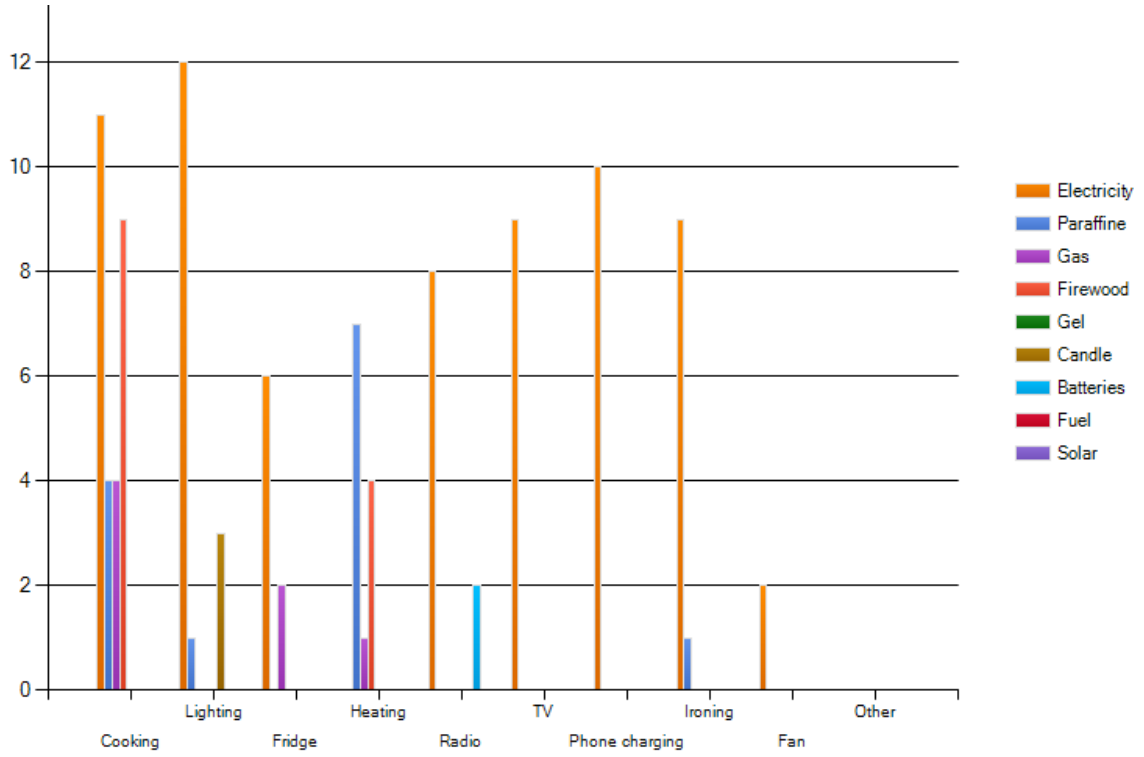


Table 6: Extend of use of different sources and for what activities mainly

Source of energy	Presentage household using this	For what activities mainly
Wood	75%	Cooking 75%, heating33,3%
Paraffin	58,3%	heating

As shown in figure 5 grid-electricity is the main E.S for all household activities, except for heating.

This finding partly correlates with information provided in the group interview in QM. Here the participants stated that grid-electricity or paraffin is used for heating (App.6).

The table below shows the applied energy sources for poor, medium and rich households in Queen's Mercy.

Answer Options	Rich	%	Medium	%	Poor	%
Cooking						
Electricity	4	100	3	75	3	75
Paraffine	1	25	1	25	2	50
Gas	1	25	2	50	0	
Firewood	3	75	2	50	3	75
Gel	0		0		0	
Candle	0		0		0	
Batteries	0		0		0	
Fuel	0		0		0	
Solar	0		0		0	
Lighting						
Electricity	4	100	3	75	4	100
Paraffine	1	25	0		0	
Gas	0		0		0	
Firewood	0		0		0	
Gel	0		0		0	
Candle	1	25	1	25	1	25
Batteries	0		0		0	
Fuel	0		0		0	
Solar	0		0		0	
Heating						
Electricity	0		0		0	
Paraffine	3	75	2	50	2	50
Gas	1	25	0		0	
Firewood	0		1	25	2	50
Gel	0		0		0	
Candle	0		0		0	
Batteries	0		0		0	
Fuel	0		0		0	
Solar	0		0		0	

In relation to the use of different E.S than grid-electricity, it is important to note two issues; All households still use the alternative sources of energy to cover their needs during power failure (App.6;14;23) and to use grid-electricity as a main source of energy requires that the household are equipped with various suitable appliances, which is not always the case (App.6).

Whether or not a household is provided with grid-electricity, it seems that wood is used and this for two reasons; it is cheap (App.6;14;15;17;23) and it is the main source of energy when cooking outside (App.7;18;23). The interviewed households mainly cook bread and porridge and boils water outside using firewood, due to tradition and as these activities are fairly extensive and time consuming (App.17;23) thus being too expensive if cooked with electricity.

Some of the participants from the survey in QM still prefer to cook outside even though they have grid-electricity.

"I only use grid-electricity for cooking when it is cold or raining. I prefer to cook outside on firewood, as it tastes better and because that's the way I am used to do it (App.23).

As indicated in figure 4 and 5, wood is being used as an E.S in most households. To elucidate the socio-economic aspects of this issue, further information on circumstances surrounding the firewood is collected.

Socio-economic aspects in regards to the usage of firewood

The answers to the question of whether the respondents buy or collect wood themselves are as shown in table 7.

Table 7 Means to attain fire wood

	Mpharane (n=28)	Queen's Mercy (n=11)
Buying	17,9 %	63,63%
Collecting	60,7%	36,36 %

Data on who is collecting the wood is only obtained from the survey in Mpharane, and the results are as given in table 8

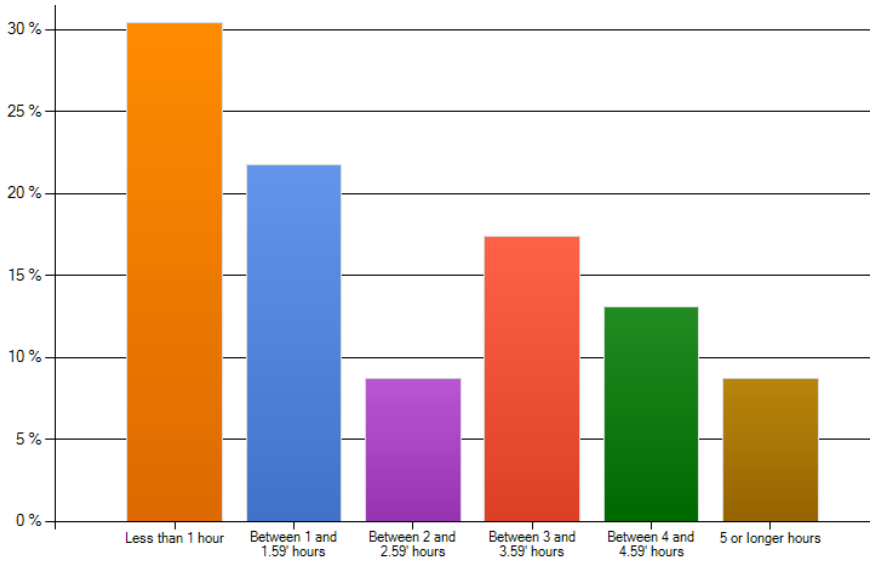
Table 8 Household member(s) collecting wood

Household member	n=22
Men	63,6%
Women	40,9%
Boys < 18 years	22,7%

The results show that it is primarily men who are collecting wood. In the households where the women are the ones collecting wood no men are noted as household members, except in two cases where one of them is 61 years old.

The time spend on collecting wood varies. In figure 6 the results from 23 respondents are shown.

Figure 6 Hours spend per time collecting wood



As it is shown in figure 6, most households use less than an hour per time they go collect wood. In order to elucidate whether or not the time spend on collecting wood is related to the frequency of collecting, the following analysis is done.

Table 9 Average time spend on collecting firewood according to frequency

	Min. time spend pr. time	Max. time spend pr. time	App. average time spend pr. time	Note
Daily (n = 3)	1½ hour	5 hours	3 hours	The household spending 5 hours, uses a part of the wood for selling
Every second day (n=1)		2 hours	2 hours	
Twice per week (n=3)	30 min.	5 hours	3 hours	
Once a week (n=6)	10 min.	3 hours	2½ hours (n=5)	One household is selling one part of the wood One household is collecting a cows load One household is both buying and collecting
Three times per month (n=2)	20 min.	1 hour	40 min.	One household is both buying and collecting
Twice per month (n= 1)		2 hours	2 hours	The household is both buying and collecting
Once per month (n=7)	30 min.	4 hours	2½ hours (n=6)	One household is collecting a wheelbarrow. One household is collecting a cows load One household is both buying and collecting

Based on the calculations in table 9, it doesn't seem that there is any real relation between time spent on collecting wood and the frequency of collecting.

There has been talk of eradicating wattle, the main source of firewood, in the area. This is mentioned by the Councilor (App.11), who does not perceive the possible intervention as a threat to the use of this as an E.S. There will still be some wattle left, especially around the houses.

Health issues

The use of the different E.S seems to cause some health problems.

Table 10 Household in which health problems caused by the current energy use have been felt

Answer Options	Response Percent	Response Count
Yes	60,0%	18
No	33,3% (50% men/50% women)	10

Paraffin seems to be a major concern in regards to health issues. As shown above most of the people use paraffin for the majority of the household activities. A tendency of awareness of three health issues is acknowledged.

Firstly 30 % of the people participating in the questionnaire survey mention coughing and respirational issues with the current use of E.S. The household interviews as well reveal that coughing due to smoke is a basis of irritation. The nurse interviewed in the clinic states that asthma is one of the major causes of people visiting the clinic (App.9). This relatively high incidence of asthma might be connected to the use of E.S, but the nurse is not sure about the correlation (App.9).

Secondly irritations and problems with the eyes connected to the uses of paraffin and fire for cooking are mentioned in 7 questionnaires (App.20), during household interviews (App.17) and in the group interview in QM (App.6). This symptom has become better after implementation of grid-electricity. (App.6)

> At the participatory household observation Emily invites us to stay while she cooks fatcakes. She lights the paraffin cooker which results in the end of the participatory observation as we have to leave the house due to the strong smell of paraffin that also burns in the eyes.

Thirdly skin burns and fires are associated with using gas and paraffin stoves and lamps, which is mentioned by the nurse (App.9) and our key informant (App.10) and becomes apparent from the questionnaire survey (App.20). *"Gas is dangerous if you don´t lock it, it can burn your house down."*

Finally a consequence of the lack of grid-electricity can cause health implications related to the services of the clinic, affecting machinery, light and fridges where to keep the medicine and vaccinations. (App.2;6;9).

Educational aspects

"We want grid-electricity because Mpharane is being oppressed and we want development here. It is much easier for children who have grid-electricity to learn than for those without" (App. 3). This is the argument of a young mother in the video argumentation as to why Mpharane should get grid-electricity.

The principal of the primary school in Mpharane is very frustrated with the lack of grid-electricity, as he perceives this a basic teaching resource. He is convinced that if the school receives grid-electricity the teaching as well as the learning facilities will improve. The school only has a generator for the most necessary electrical equipment in the office, thus the teachers are not able to utilize basic teaching facilities, e.g. overhead projectors, light on dark, rainy days and access to the Internet for communication through emails and information (national as well as international news and education and teaching policies) (App.8). The possibility of having electrical light in the houses would also enable the children to study after sunset and thereby improve learning and education (App.16). The principal states: *"You don't have to share the only paraffin lamp which is in the house with all the others"* (App.7). Another effect of having grid-electricity is improved attendance at school due to the shortened preparation time at home in the morning (App.7). This is noticed both by the principal and in the households (App.7;17;20).

Gaining information, getting insight into global news and being able to integrate these in problem solving assignments are possible with the use of TV's in addition to the use of Internet (App.16;5). The students can moreover watch educational programs in the TV. The importance of visual learning is raised by the principal of QM primary school and agreed upon among the participants of the problem ranking: *"It is better if you can actually see the things you want to learn – for example as it is now, they can't see what a real globe is like"* (App.2). *"It increases their learning skills when they are able to learn visually. They can for example see what an earthquake actually is"*(App.7).

However the causality between grid-electricity and improvement of education opportunities are not necessarily the same de jure as de facto. Implementation of computers and Internet in the teaching is still not commenced in QM primary school, due to a lack of time and budget and since the teachers are not yet qualified to use the computers. As the principal of the primary school in QM acknowledge: *"We are still left behind. The teachers do not know how to use the computers. At other places 10 year olds know how to use computers"* (App.7). In this regard the inhabitants interviewed in QM haven't noticed any real influence of the electrification of the school in 2011 (App.5).

During the interview with the principal there is a power cut in his office. The principal does not notice or at least does no react at all to this, which indicates that it may be something that occurs on a regular basis. For the same reason they do also still keep the solar panels as a backup in case of power failure (App 7).

Income generation opportunities

Light is not only improving the facilities for learning. The possibility of continuing activities after sunset is perceived as an increase in the quality of life, since it is much cooler to work in the evenings (App.15).

Through the problem ranking exercise an important reason for implementing grid-electricity in Mpharane is its foundation for generating income through jobs and business. Creating job opportunities in Mpharane can possibly constitute an incentive for the children stay in the area as they would be able to do businesses here.

"We want grid-electricity in Mpharane for the reason that we want our children to be able to start businesses, so they can stay in Mpharane, because when they have to look for jobs elsewhere it costs their parents' money" (App. 3).

Businesses that could be made possible by implementing grid-electricity suggested through the problem ranking and the semi-structured interviews are sewing, chicken farming (since the white breed needs heaters), welding, working in the plantation with grid-electricity driven machines, opening a small shop or a hair salon (App.2;10;16;17;18). Solar panels would not be efficient enough for these kinds of things; *"If it rains there is no business"* (App.10). Barber shops, wood cutting and welding are mentioned during the group interview in QM as income generating opportunities made possible by the implementation of grid-electricity (App.6).

On the last day of our research a participatory observation session is conducted in our respective families. We participate in the everyday activities that occur during the morning. After a couple of hours being present in the houses a relaxed and natural atmosphere is created. All of a sudden the mother takes out a bag from the bottom of the closet. In the bag she has a big purple hair dryer, which she proudly shows us with the statement that she bought it 3 years ago and now she's only waiting for the grid-electricity necessary to start using it and opening a hair salon.

Safety issues

The fear of crime shines though in our findings: "*I want grid-electricity because I would feel more safe - right now people are knocking my doors at night and I'm is afraid of thieves"* (App.20). According to the nurse in Mpharane raping is the biggest issue, especially elderly women and children are exposed some with fatal consequences (App.9). Safety is not only an issue within the households; the school is also experiencing theft problems. The principal finds it problematic that their night caretakers have to use candles and torches when guarding the school during the night (App.8).

One of the inhabitants of QM feel safer in their homes after the installation of light (App.6), But most don't, since the lights are only in the houses, which means that burglars and rapists are still able to easily hide in the streets (App.5).

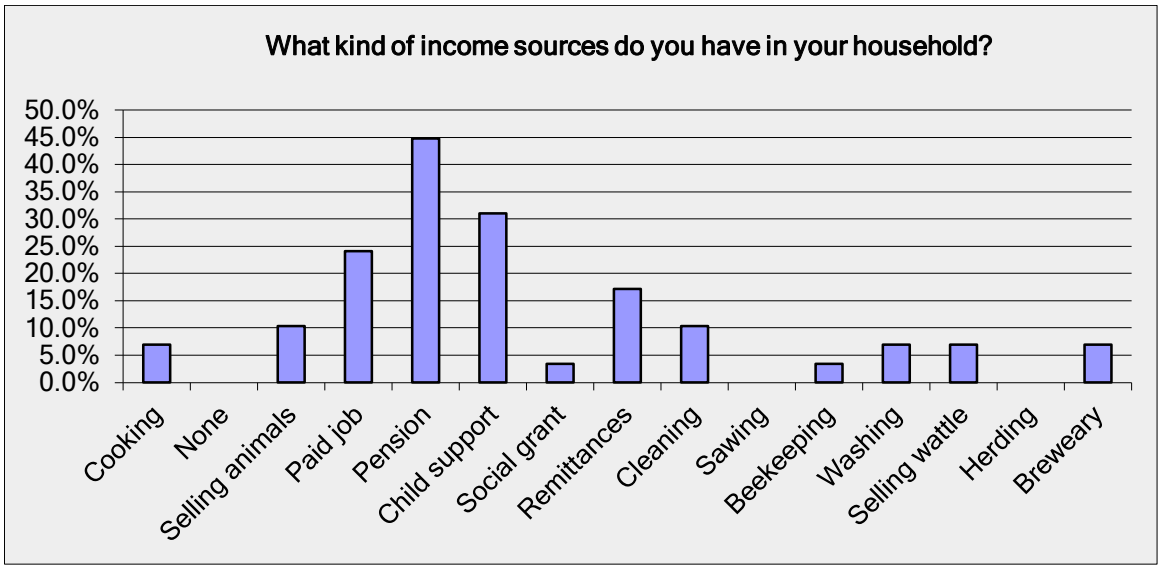
> As stated *"Lights in the streets will improve the lives in relation to a reduction in theft"* (App.16). *"We want grid-electricity here in Mpharane, so we can have lights. If there is grid-electricity and thereby light it can reduce crime"* (App.3)

However light in itself only seems to have reduced crime in QM on the school (App.7). The inhabitants are aware that in order to improve security there is an urgent need of installations of streetlights (App2;3;4;5;7;8;16).

Economical aspects

There are two main sources of financial capital; available stocks (savings) and regular inflow of money. 26,7% of the respondents has savings. Figure 7 shows the results for sources of inflows of money from the questionnaire survey conducted in Mpharane. 60% of the respondents have an income from various income generating activities of which 44,4% states these as their main income source. 33,3% of households having income generating activities, have an income that can be characterised as reliable and stable. All of these households state this income as their main.

Figure 7 Different income sources in the households



The table below shows the average monthly income for poor, medium and rich household respectively.

	#	TOTAL	AVERAGE
MEDIUM	8	13496,0	1687
POOR	7	6454,0	922
RICH	4	11224,0	2806

During the data collection in Mpharane, most of the interviewed people state that one of the main reasons for wishing grid-electricity is that this is thought to be cheaper than the current E.S (App 2;5;21). In order to elucidate this statement, a comparison of the energy expenditure between households in Mpharane and QM is carried out.

Following points explain how this economic analysis is carried out:

1- Data is obtained through information from the 30 questionnaires conducted regarding the general energy use in Mpharane, where specific questions are included about the monthly budget for energy per household. According to our household assessment, we conducted 6 questionnaires in "rich" households, 12 in "medium" and 12 in "poor" households.
2- In Queen's Mercy a total of 12 short and specific questionnaires are conducted regarding the energy budget for the different households with the objective of getting a general overview of the different energy budgets depending on the socio-economic classification, by obtaining data from 4 "rich", 4 "medium" and 4 "poor" households.
3- The first step in the analysis consists of summing up all the different monthly energy expenses collected from the questionnaires in a column called **TOTAL**. Once we have this information, the total is divided by the number of persons living in the household to get a total monthly budget per member of the household. This is shown in the column called *TOTAL per person*.
4- The second step of the analysis is gathering this *TOTAL per person* expenses into the three different categories previously mentioned ("rich", "medium" and "poor"). The monthly average per household member for the three different economic situations is finally calculated by dividing for the number of houses.

This process is done for the questionnaires from Mpharane and Queen's Mercy, differing only in that for Queen's Mercy there is a column for the money spent monthly on grid-electricity.

When certain codes for a variable are identified as "No data obtained", these codes will be excluded automatically from any mathematical calculations that are carried out on the variables (SPSS Statistics for Social Scientist, Ciaran Acton et al. 2009). Therefore, households with missing data on either monthly expenditures or monthly income were not taken into consideration for the analysis and marked with black color line as *No data obtained.*

Table 11 Monthly expenditures on energy sources, Mpharane

			Rands per month in:								
Questionnaire	CLASIFICATION	# people in the H.H	GAS	PARAFFIN	CANDLES	BATTERIES	WOOD	FUEL	PHONE	TOTAL	TOTAL per person
1	MEDIUM	9	165	55	28	5				253	28,1
2	MEDIUM	6	190	800	72	12				1074	179,0
3	POOR	2		200	20		25			245	122,5
4	POOR	4		40	48					88	22,0
5	RICH	11	380	208		80	1050	240		1958	178,0
6	POOR	5		100	200	14			50	364	72,8
7	POOR	2		70		6				76	38,0
8	POOR	1		50	16					66	66,0
9	MEDIUM	3	117	300			17			434	144,7
10	MEDIUM	5	117	25						142	28,4
11	POOR	3		690	67,5					757,5	252,5
12	MEDIUM	5		138	45					183	36,6
13	RICH	5	134	200				250		584	116,8
14	MEDIUM	3		100		40	234			374	124,7
15	MEDIUM	6		200			700			900	150,0
16	MEDIUM	1		150		11,5				161,5	161,5
17	RICH	2	380	200	15	12	34			641	320,5
A	MEDIUM	6	400	400	35					835	139,2
B	POOR	2		50	25				5	80	40
C	POOR	7		240	78				60	378	54
D	MEDIUM	6	385	120	40	12			20	577	96,2
E	RICH	8	400	500		50	125			1075	134,4
F	RICH	3	24	200	30	28				282	94,0
G	POOR	2								0	0,0
H	MEDIUM	3								0	0,0
I	RICH	3	700	200		50		600		1550	516,7
J	POOR	5		300	35	40	75			450	90,0
K	POOR	2		300	7	12	130			449	224,5
L	POOR	2								0	0,0
M	MEDIUM	3	420	200	15					635	211,7

	#	TOTAL	AVERAGE
RICH	6,0	1360,3	226,7
MEDIUM	11,0	1299,9	118,2
POOR	10,0	982,3	98,2

No data obtained

Table 12: Monthly expenditures on energy sources, Queen's Mercy

		Rands per month in:									
CLASIFICATION	**# people in the H.H**	**ELECTRICITY**	GAS	PARAFFIN	CANDLES	BATTERIES	WOOD	FUEL	PHONE	**TOTAL**	TOTAL per person
RICH	5	150	150	400	11	5		285		1001	200,2
MEDIUM	3	80	280	100			59			519	173,0
MEDIUM	6	150		50	15		67			282	47,0
POOR	8	80		200	11					291	36,4
POOR	3	30			15					45	15,0
RICH	5	200		250				30		480	96,0
RICH	4	200	300	80			25			605	151,3
RICH	6	150		300						450	75,0
POOR	2	30		50			37,5			117,5	58,8
MEDIUM	5	75	90				71			236	47,2
POOR	3	130		50		16	67			263	87,7
MEDIUM	5	100	250				84			434	86,8

	#	TOTAL	AVERAGE
RICH	4,0	426,5	106,6
MEDIUM	4,0	354,0	88,5
POOR	4,0	197,8	49,4

Table 13 Comparison between monthly expenditures on energy sources in Mpharane and Queen's Mercy

Comparison on energy spending between households.

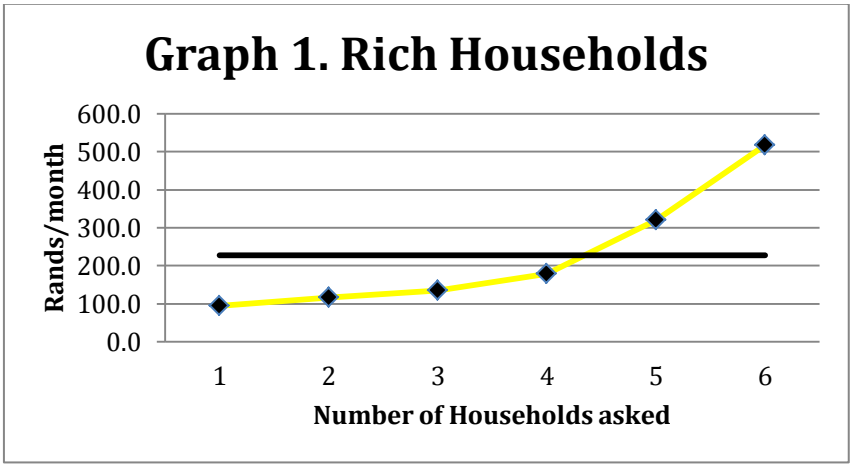
		AVERAGE per person (rands/month)
QUEENS MERCY	RICH	106,6
	MEDIUM	88,5
	POOR	49,4

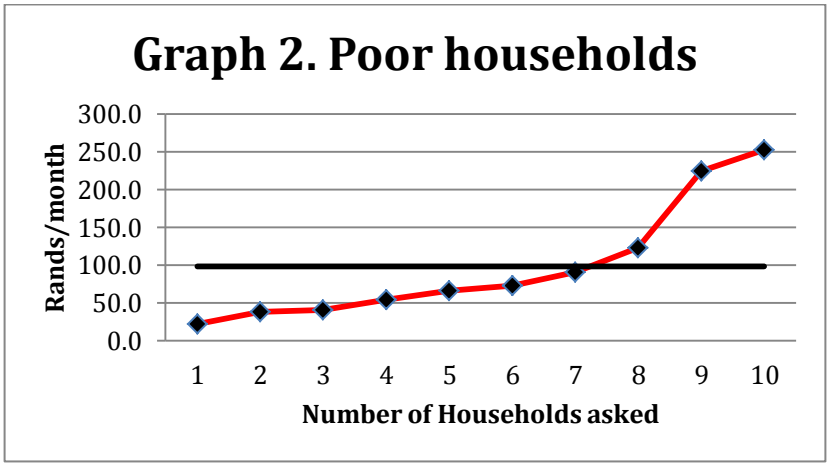
		AVERAGE per person (rands/month)
MPHARANE	RICH	226,7
	MEDIUM	118,2
	POOR	98,2

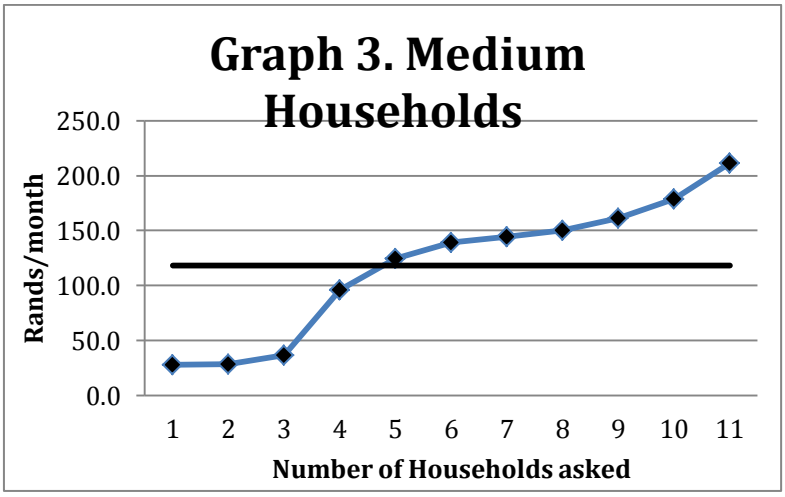
Note on the conditions for the economical analysis:

Fully aware of the limited data collected, we consider that the comparison correctly transmits the differences among the three different household categories and between the cost of energy for households with access to grid-electricity in QM and those without it in Mpharane.

One of the main problems of working with such small data is the difference found between households' expenses, which vary depending on the families and the information given for the questionnaires. This variety of data collected is shown in the **graphs 1, 2 and 3**. However, we consider that the average of these values (black line) offer a number close to reality and therefore it is valid for our analysis.







The first thing we observe in the comparison table (Table 13), is that the proportion seems to follow a logic pattern, with rich households spending more than medium, and those spending more than the poor ones, both for Mpharane and QM.

A second observation is that the average energy expenditures of rich households in Mpharane are more than twice the amount of those in QM (R226 vs. R106). The difference is twice as big for the poor households as well (R98 vs. R49). The difference in expenditures between medium households is only R30 though (R88,5 vs. R118,2).

Lastly it is observed that most of the households are energy poor. Table 14 shows that only 4 out of 19 households are not considered energy poor according to the definition. Another observation is the differences in energy expenditure as a percentage of monthly income between the household categories, where poor households show an average of 42,5% whereas both medium and rich households uses around 25%.

Table 14 Percentages of monthly income spent on energy in Mpharane

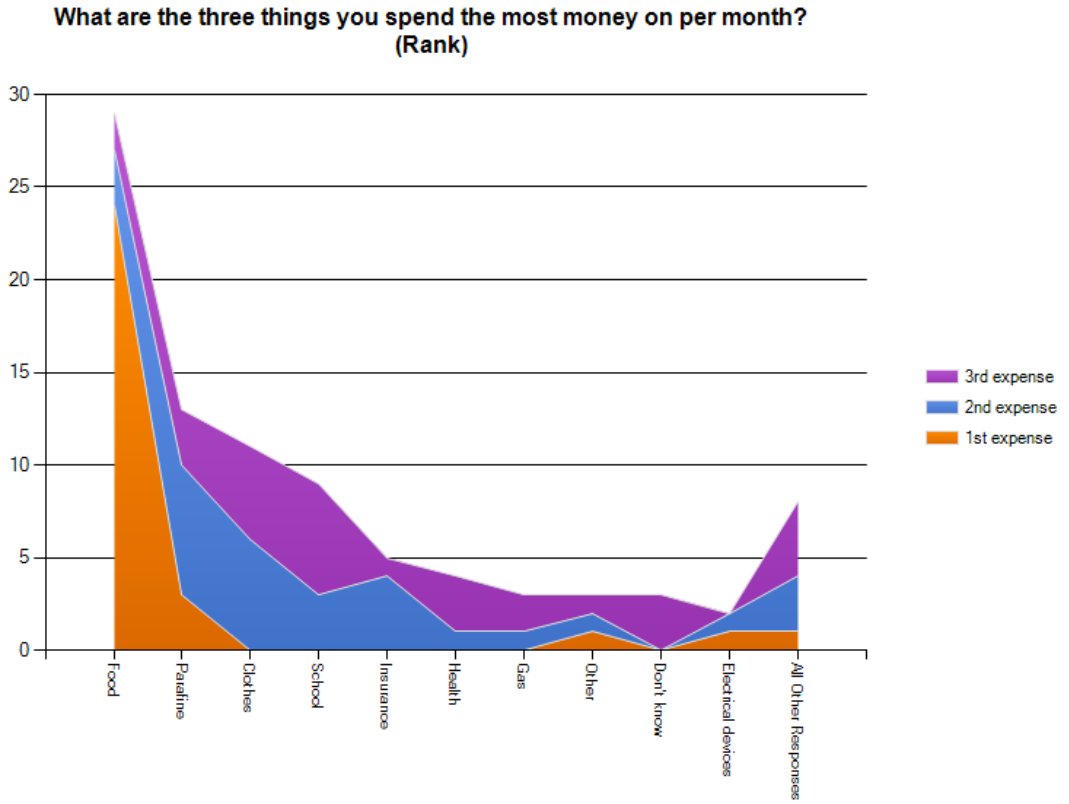
Questionnaire	CLASIFICATION	TOTAL	MONTHLY INCOME	Total/Month Income (%)
1	MEDIUM	253	1180,0	21,4
2	MEDIUM	1074	4090,0	26,3
3	POOR	245		
4	POOR	88	1480,0	5,9
5	RICH	1958	5000,0	39,2
6	POOR	364	400,0	91,0
7	POOR	76	1200,0	6,3
8	POOR	66	1200,0	5,5
9	MEDIUM	434		
10	MEDIUM	142	2400,0	5,9
11	POOR	757,5	500	151,5
12	MEDIUM	183	1200,0	15,3
13	RICH	584		
14	MEDIUM	374	916,0	40,8
15	MEDIUM	900		
16	MEDIUM	161,5	450,0	35,9
17	RICH	641		
A	MEDIUM	835	2100,0	39,8
B	POOR	80		
C	POOR	378	600,0	63,0
D	MEDIUM	577	1160,0	49,7
E	RICH	1075	4000,0	26,9
F	RICH	282	1200,0	23,5
G	POOR	0		
H	MEDIUM	0		
I	RICH	1550	14200,0	10,9
J	POOR	450	1024,0	43,9
K	POOR	449	550,0	81,6
L	POOR	0		
M	MEDIUM	635		

	#	TOTAL	AVERAGE
MEDIUM	8,0	194,3	24,3
POOR	7,0	297,4	42,5
RICH	4,0	100,5	25,1

No data obtained

Expenditures on E.S take up a significant part of the monthly budget. This finding is confirmed in the questionnaire survey from Mpharane where paraffin is ranked as the second highest expense (Figure 8) among the three things spent most money on, only exceeded by expenses on food.

Figure 8 Most important expenses in the households



Discussion

In the following section it will be discussed how the provision of grid-electricity might influence on the capital pentagon and thus on the livelihood strategies and outcomes of the inhabitants of Mpharane.

From our findings it is evident that the people of the community are not satisfied with their current energy use and it seems that they are associating the provision of grid-electricity with an improvement of the everyday life.

There are no doubts that on all levels, from the individual household, where several people already have invested in electrical appliances in order to start businesses when electricity arrives, to the national government, everyone is preparing for an electrification of Mpharane. The question is just when it is going to happen.

Structures and Processes

Uncovering political vulnerability and the ways structures and processes affect, constrain or diminish livelihood options, is a key aspect within this research. Therefore one aim of this discussion is to elucidate the influence of structures and processes on the vulnerability context in which the community of Mpharane is placed.

As indicated in the findings a governance trend towards providing the poor rural areas, such as Mpharane, with grid-electricity has emerged since the end of apartheid in 1994. Especially the RDP had the potential to benefit the poor, as it was meant to ensure that essential service needs were met through increases in government subsidies (Bond 2002). Though, there have been disjunctions between what was required and what was offered by the post-apartheid bureaucrats. It seems that a part of the explanation to this is the neoliberal influence on the processes. The NEP was target-oriented, but the neoliberal trend within the infrastructure processes meant that the electrification process was primarily directed by marked forces such as supply and demand and marginal costs, which meant that the most cost-effective areas were electrified first. Because of a low demand in rural areas due to poverty, and Eskom's elevated marginal costs when supplying these remote areas, Eskom's rate of new rural electrification connections have been declining (Bond 2002). From 2001 the State began funding electrification directly from the fiscus[13], and subsidized the entire capital cost of connection and electrification went through a transition from being a socially desirable (but economically limited) activity to an imperative, brought about broadly by the commitment to service delivery as stated in the RDP (Bekker et al. 2008).

As a part of the apartheid legacy, rural areas have been left underdeveloped and largely unserviced and in 2000–2001 the government saw the culmination of a number of different developments that resulted in policy shifts which significantly changed the institutional basis of the electrification programme. This involved the post-transition development of policy frameworks in a number of spheres, including the IDP framework implemented in 2001 (Bekker et al. 2008) partly aiming to overcome the poor planning of the past.

As mentioned in section X, one aim of the IDP framework is to base development planning on issues articulated by different stakeholders within the local government (IDP 2012). However,

[13] Whereas before electrification has been funded almost entirely internally from surpluses within the state-owned monopoly utility, Eskom (Spalding-Fecher, R. 2005).

as indicated in the findings there seems to be contradictions between the local plans for development and processes within the national sphere, with the latter overruling the former, leaving the community of Mpharane highly dependent on decisions made in the national sphere of government on which they have very little influence.

The livelihoods and the accessibility of capitals are fundamentally affected by the abovementioned political trends, still impeding them the access to grid-electricity. As indicated above, even when trends outwardly seem to move in the right direction, the poorest people are often left behind unable to benefit because of a lack of resources and strong structures working in their favor. Nevertheless it seems that the INEP is working towards a universal electrification and that Mpharane therefore will be provided grid-electricity sometime in the future. Arguments for supplying grid-electricity to Mpharane can be found within the multiple influences on the livelihoods, which will be discussed in the following section.

Livelihood capitals

In regards to the capital pentagon we are using the physical capital as an entry point, as electricity is seen as a factor within this capital. The following intends to elucidate the influence electricity can have on the composition of the pentagon and to examine how alterations affect the possibilities for the inhabitants of Mpharane to achieve a positive livelihood outcome.

Financial capital

According to our findings, 78.9% of the households in Mpharane are energy poor. The average percentage of the monthly income spent on energy is 31%. Compared to an average of 16% for the households in rural areas on a national level (DoE 2012), this number is relatively high. Though, it is difficult to conclude anything from our finding due to a small sample size, as well as the fact that income related questions are sensitive and complicated to answer, what might have biased the results. Yet, the finding might indicate the tendency of energy expenditures taking up a significant part of the monthly budget.

As is stated by the DoE, implementation of grid-electricity influences the possibility of reducing the expenditure on energy, indicated by a higher report of energy poverty in non-electrified than electrified households (65% versus 39%) (DoE 2012). This tendency is also

indicated by the findings within this research, as it is shown that electrified households spend less money on energy than non-electrified.

When analyzing upon the findings in QM it appears that once electrified people change their energy use patterns into including electricity for almost all household activities. However there seems to be a big difference in being member of a rich or a poor household as to the extent of the impact of electricity. Due to a very low monthly income, the poor households might not have the financial capability to invest in electrical equipment necessary to exploit all the benefits implementation of grid-electricity can bring. This is underlined by fact that households, especially the poor, continue to use firewood, primarily for cooking and heating, after the provision of grid-electricity, which might be due to the fact that firewood can be collected for free and doesn't require new investments. Still, the possibility of reducing energy expenses due to provision of grid-electricity stands clear and has a potential positive effect on the livelihood outcome.

Income generating activities

In this research it is found that even though 60% of the respondents have inflow of money from various income generating activities, close to three-quarters rely on inflows from various social grants. In order to make a positive contribution to financial capital the inflows from the income generating activities must be reliable, which is only the case for one-third of the respondents. This indicates that the majority of people preforming income generating activities is not capable of creating an income sufficiently high to sustain a living.

Our findings indicate that electricity has the potential to influence the regular inflow of money, through enabling small scale entrepreneurship, and improve existing income generating activities. This finding is confirmed by the literature (Modi et al. 2005 KILDER), and underlined by the fact that many of the respondents are eager to start up small businesses such as hair-saloons, welding, sewing and carpentry, all of them requiring electronic devices, when electricity is provided. Besides these obvious advantages, businesses already existing in Mpharane might increase their income because of improved circumstances, e.g. through the investment in new and bigger fridges running on electricity instead of gas at the supermarket and through decreased expenditure on energy.

All of these improvements do however require more than just an installation of grid-electricity. Personal initiatives, motivation and ideas are core foundations besides economic resources for initial investments.

On the contrary grid-electrification could possibly influence the current market of energy sources, affecting small businesses delivering and selling wood, paraffin or gas. One could speculate whether the business activities would be reduced along with the installation of grid-electricity. However as argued above and throughout our findings it is clear that the inhabitants, to some extent, will continue to use these sources of energy. Therefore the existing businesses may be affected but not excluded from the marked.

With a general limited budget of the inhabitants of Mpharane, an increase in the financial capital, as a result of more regular inflow of money due to improved business conditions, and reduced energy expenditures, could be argued to contribute to the achievement of positive livelihood outcomes. Furthermore an increase in financial capital might influence the accessibility to, or be directly converted into, the other capitals (DFID).

Human capital

The human capital is an essential capital within the pentagon, if not the most important since human capital is required in order to incorporate any of the other assets in the pentagon (DFID 1999). Within this capital, ill-health and lack of education are argued to be the core dimensions of poverty and perceived to be the most important livelihood objective to improve in order to overcome poverty (Ibid). Beside these two dimensions, improved security is perceived to be a result of electrification. In the following sections these dimensions and their influence on the livelihoods are discussed.

Health

In the World Energy Assessment (Holdren and Smith 2000) it is stated that exposure to indoor air pollution is one of the most significant energy-related factors influencing health in developing countries. In South Africa it appears that the health impacts of household fuels, including exposure not only to pollution but also to fire and poisoning hazards, are significant problems for poor communities (Spalding-Fecher et al. 2000). In particular the use of paraffin can impact on poor households in several ways including poisoning, respiratory illnesses as a result indoor air pollution, burns and fires (Panday and Mafu 2007). Throughout our study it

is encountered that people experience respiratory and eye complications as a consequence of their current uses of energy sources. Burns and fires are if not personally experienced then at least known of to many of our interviewees. In the findings it is indicated that these symptoms and occurrences are decreased after implementation and use of grid-electricity.

The extent of the impact of grid-electricity on health issues can be discussed, as the findings indicate that people, to some extent, continue the use of alternative energy sources after implementation of electricity. Nevertheless cooking sources, especially paraffin which causes the most common health problems, seem to be replaced with electricity. Improved health, might also lead to reduced medical expenses which would additionally improve the economic situation in the household.

Our findings indicate that provision of grid-electricity can also improve the services offered in the health clinic significantly. The partial replacement of firewood, gas and paraffin with electricity, which is cleaner and safer in regards to health, combined with the accessibility to improved health services, can potentially contribute to the achievement of positive livelihood outcomes and thereby impact the vulnerability in a positive way.

Education

Previous studies have shown that improvement of the educational level is a root to poverty alleviation (Lakin et al. 1997). Therefore, everything that can improve the learning conditions also has the potential to improve livelihood outcomes and diminish the vulnerability, a postulation underpinned by the inhabitants of Mpharane's own perceptions of development and the way out of "oppression".

This study is dealing with households consisting of many children in the active school age, yet there seems to be an issue with a lack of school attendance. What an installation of electricity can potentially do is to substantiate the attendance at school due to reduced preparation time in the morning. Additionally electricity would make household activities easier and faster, thus diminishing the necessity of the children assisting in such and potentially giving them more time for studying. More importantly electricity can improve the learning conditions through light facilities, especially on dark rainy days, and visual and active learning.

However as the principal of QM primary school acknowledges more direct improvements of the educational outcomes may take time and most of all funding. It can hence be argued that

even though the primary school of Mpharane is supplied with grid-electricity the constraints in regards to educational and learning processes associated with lack of electricity will not fully be eradicated due to the abovementioned issues and the current instability of the provided grid-electricity.

Security

Another thing that cannot fully be eradicated by provision of grid-electricity is the feeling of insecurity. With this being said, the general idea within the community seems to be that installation of light in general and streetlights more specifically will reduce crime rates. Issues of rape and thefts are especially prevailing in Mpharane and currently many of the respondents fear for their safety, even in their own homes. However based on findings from a comparison with QM, light on its own does not seem to reduce the fear of crime. Therefore, besides providing households with electricity, installation of streetlights appears to be needed, in order to optimize the impact of electrification on livelihood outcomes such as increased well-being.

Natural capital

The focus of natural capital within this research is on the use of firewood, which is a useful natural service for the livelihoods of the inhabitants of Mpharane.

If becoming provided with electricity the inhabitants would be expected to become less dependent on firewood as a source of energy. A consequence would be less vulnerability to changes in the access to natural resources. Currently there are discussions on eradicating wattle (firewood) in the area (de Neergaard et al. 2005), and in that sense being less dependent on this resource would be beneficial to the inhabitants. Though, the findings in the present study do not indicate that the inhabitants would stop using firewood as a source of energy even when being provided with grid-electricity. Especially for the poor inhabitants as they would not necessarily all have the money to obtain electrical appliances to fully benefit from an electrification. They would thus still be dependent on the natural resource to some extent, and they will therefore be negatively influenced by an eradication of wattle. A mitigating circumstance is that it seems that not all the wattle will be eradicated, at least not those growing around the houses.

Whether being particularly vulnerable to alterations in the access to natural resources after being provided with grid-electricity is a matter we cannot conclude anything finally on within the scope of this study, though speculations can be made weather the influence will differ among social classes in the community.

Social capital

In the context of the SLF social capital means the social resources upon which people draw in pursuit of their livelihood objectives (DFID 2000). Social capital in this research is closely related to the use of natural resources (firewood), and the focus is on horizontal networks between people, based on the assumption that people, especially women, collect firewood in groups (KILDE).

If firewood is to some extent replaced by electricity as a source of energy this basis of social network would potentially be reduced. Though, our findings are quite surprisingly that there is no clear pattern as to which gender is collecting the wood. No indications were found that there are any particular social networks connected to firewood collection in Mpharane as people either collect themselves for domestic use nearby the house, which is often done by men and boys if they are present in the household and takes less than 1 hour in most cases, or buy cow or tractor loads. The relatively limited amount of data we have collected on this matter of interest thus implies that implementing electricity will not have any significant effect on the social capital of the inhabitants in Mpharane.

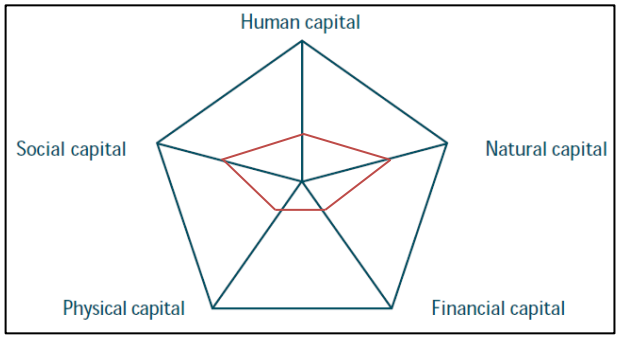
The Capital Pentagon in perspective

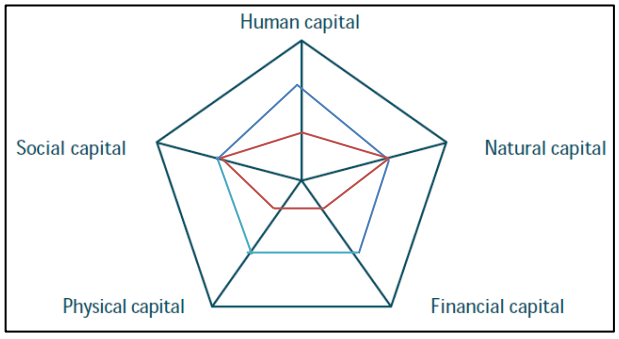
As seen in the discussion, an increase in physical capital does specially have the possibility of increasing the financial capital, which might influence the accessibility to, or be directly converted into, other capitals, e.g. physical capital (investments in TVs, computers and other electrical appliances), and thereby influence on human capital etc. The influence of the capitals can just as well be reversed e.g. through an increase in human capital, due to improvement of the health conditions, can instigate reduction of medical expenses and thereby influence the financial capital.

The findings within this research do not indicate a significant influence on social and natural capital through the provision of grid-electricity. This does not mean that influences could not emerge through a more in-depth research.

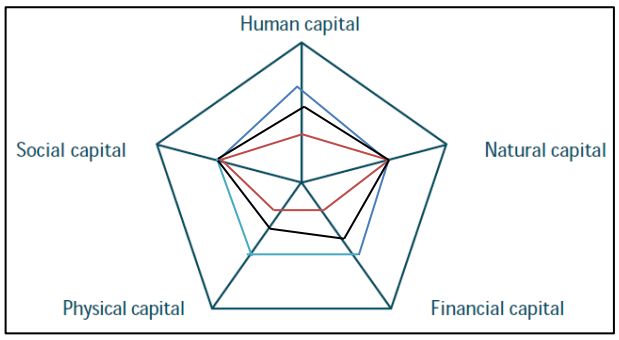
Overall it seems that an increase in physical capital, through the provision of grid-electricity, have the potential to influence the overall livelihood of the inhabitants through achievement of positive livelihood outcomes.

In the figures below we aim to illustrate the composition of the pentagon before providing grid-electricity (red lies) and after increasing the physical capital due to electrification (blue lines):





As mentioned the pentagon does slightly differentiate between rich and poor households. In the figure we strive to show the pentagon for a poor household (black) compared to a rich household (blue).



Conclusion

The objective of this report has been to investigate the role electrification related structures and processes play in the vulnerability context of the population of Mpharane and to analyse the potential influences grid-electricity can have on the livelihoods in this context.

The wider accessibility to capitals of the inhabitants and their vulnerability is fundamentally affected by political trends to which the individuals feel powerless due to limited or no influence. It has been found that national processes and structures seem to overrule local plans for development leaving the community of Mpharane highly dependent on decision making at the national sphere of government. Even though trends within this sphere outwardly seem to move in the right direction, stating an aim of universal grid-electrification in South Africa, various agendas have resulted in the impediment of access to grid-electricity for many poor areas in the country. Nevertheless it seems that Mpharane will be provided with grid-electricity sometime in the future, and within this research multiple positive influences on the livelihoods of the inhabitants are identified.

An increase in physical capital does especially have the possibility of increasing the financial capital. With a general limited budget of the inhabitants of Mpharane, an increase in the financial capital, as a result of more regular inflow of money due to improved business conditions, and reduced energy expenditures, could be argued to contribute to the achievement of positive livelihood outcomes. This increase in financial capital might also influence the accessibility to, or be directly converted into, the other capitals e.g. physical capital (investments in TVs, computers and other electrical appliances), and thereby influence on human capital through improved learning facilities and access to information.

In relation to the influence on human capital, our findings further indicate that provision of grid-electricity can also improve the services offered in the health clinic significantly. A partial replacement of firewood, gas and paraffin with electricity, which is cleaner and safer in regards to health, combined with the accessibility to improved health services, can potentially impact the vulnerability in a positive way. The influences on human capital also impact e.g. the financial capital, due to improvement of the health conditions, and thus a reduction in medical expenses.

The findings within this research do not indicate a significant influence on social and natural capital through the provision of grid-electricity. This does not mean that influences could not emerge through a more in-depth research.

Overall it seems that an increase in physical capital, through the provision of grid-electricity, have the potential to influence the overall livelihood of the inhabitants through achievement of positive livelihood outcomes. However, it is important to note that the alterations of the pentagons composition do slightly differentiate between rich and poor households.

There is a tendency that people perceive grid-electricity to be the answer to a lot of their needs and wishes and a sort of redemption from “oppression” and lack of development in the community. This redemption is argued by the inhabitants to be possible though improved educational facilities, increased communication facilities and income generating activities, all perceived to be enabled through provision of grid-electricity. All of these improvements can however be argued to require more than what an installation of grid-electrification can possibly provide.

There is no doubt that lack of electricity in Mpharane is perceived as a burning issue. On the other hand the inhabitants of Mpharane have been able to deal with the lack of grid-electricity though centuries. The burning need for electricity could be associated with the fact that the neighbouring village was provided with grid-electricity two years ago and lights up the landscape just on the other side of the river every evening. Having to share transport in to town with inhabitants form QM –people who are now experiencing the benefits of grid electricity, simply just make the issue an urgent one that needs to be met as soon as possible.

Critic of theory

This simple and rather obvious framework is not as simple, as one would think, to translate into practice. A critic of the figure 1, that we are basing the research upon, is that it could be argued to consist of more interrelated arrows since all aspects affects each other in the framework e.g. making the livelihoods outcome directly affect the vulnerability context. As shown throughout this discussion of our findings, the capitals in the pentagon are deeply interdependence and one capital cannot be analysed without incorporating aspects of others. As mentioned in the above, human capital is argued possibly to be the most important among the five capitals (DFID 2002). The factors investigated in the present study that are contained in human capital including; health and security issues and lack of education, can therefore be argued to be essential in regards to the livelihood outcomes of the people of Mpharane. Although we find it to have an essential influence on the livelihood strategies and outcomes it can be questioned which capital is the most influencing or important as we find them to be interdependent and affecting each other in ways which make it difficult to separate the capitals and evaluate them individually.

The framework has furthermore been criticised for not really having influence in regards to reducing poverty. Though acknowledging the locally-embedded contexts and place-based analysis Scoones argues that the livelihoods perspectives are in need of new innovative thinking that address the challenges of rapid globalisation, disruptive environmental change and fundamental shifts in rural economies. Especially the themes of knowledge, politics, scale and dynamics needs, according to Scoones, to be concretely questioned into in order for the livelihoods perspectives to keep its relevance.

Reflection on the validity of the findings

Beside the reflections on the specific methods, a reflection in a broader perspective is needed in order to evaluate on the validity of our findings.

In general we are dealing with small sample sizes, which influence the validity of concluding on any generalizations. It can be argued that we only are able to say something about the small percentage of the inhabitants in Mpharane that we have collected data from, however Kvale et. al. do argue for the validity of analytical generalization based on the patterns that the chosen group represent (Kvale et. al. 1996).

The validity of our findings can also be criticized from another perspective. Since we are using an interpreter we cannot be sure that exact phrasing is being used, which, especially when conducting a questionnaire, can be argued to have great importance (Olsen 2001). Not only a foreign language but also a different cultural setting may suffer the consequence of certain information being lost in translation.

Since our research focus changed after entering the field of investigation our method equally transformed from a study of the situation in Mpharane to become more of a comparative study between an electrified and non-electrified village. This comparison is not fully valid since we neither utilize the exact same methods in these two villages nor collect the same quantity of data. Thereby we do not possess the same insight of the current situation in QM.

One of these missing data arises as an issue during the analysis. It originates from the lack of information regarding the monthly income in the households of QM and influencing the validity of the possible savings grid-electricity may bring. This is an excellent example of the importance to limit your schedule for data collection to allow time for reflection upon the researched objectives while still being in the field.

Literature

Articles/texts:

ANC, (1994). The Reconstruction and Development Programme.

Bekker et al. (2008). South Africa's rapid electrification programme: Policy, institutional, planning, financing and technical innovations.

Blaikie, N., (2007): *Approaches to social enquiry – advancing acknowledge*. 2. eds, Pulty, Cambridg

Bond, P. (2002). Unsustainable South Africa.Environment, Development and Social Protest.Chapter six.

Cavendish, W., (2000); *Empirical Regularities in the Poverty-Environment Relationship of Rural Households: Evidence from Zimbabwe*. World Development, Volume 28, Issue 11, November 2000, Pages 1979-2003

Dalal-Clayton, B et al. (2003): *Approaches to participation in planning*. In B. Dalal- Clayton, et al. (Eds.): *Rural planning in developing countries: supporting natural resource management and sustainable livelihoods*. Earthscan Publications Ltd, 90-132. 42p

Davis M., (1998): *Rural household energy consumption. The effects of access to grid-electricity – evidence from South Africa,* Elsevier Science Ltd.

de Neergaard et al. (2005). *Australian wattle species in the Drakensberg region of South Africa – An invasive alien or a natural resource?* Agricultural Systems 85, 216-233

DME, (1998). White Paper on the Energy Policy of the Republic of South Africa.

Halkier, B. & Jensen, I. (2008): *Det sociale som performativitet – et praksisteoretisk perspektiv på analyse og* metode. In: Dansk Sociologi 3

Holdren, J. P., and K. R. Smith. (2000). *"Energy, the Environment and Health."* World Energy Assessment: Energy and the Challenge of Sustainability. United Nations Development Programme.

Kvale, S. (1996): *Interviews. An introduction to qualitative research interviewing.Chapter 11, Methods of Analysis.*

Lakin et al. (1997). *Adult Education in a Polarizing World*. UNESCO

Madubansi M., &Shackleton, C.M., (2005): *Changing energy profiles and consumption patterns following electrification in five rural villages, South Africa,* Energy Policy, Elsevier

Marquard, A., Et. al., (2007): *South Africa's Electrification Programme – an overview and assessment,* MIR, South Africa.

Mikkelsen, B. (2005): *Methods for development work and research. A new guide for practitioners.*Sage publications, London.

Modi et al. (2005). *Energy Services for the Millennium Development Goals. Achieving the Millennium Development Goals.* The International Bank for Reconstruction and Development/The World Bank and the United Nations Development Programme

Olsen, H. (2001) *Tallenes Talende Tavshed, Måleproblemer i surveyundersøgelser, Academisk forlag*

Panday, S., & Mafu, S. (2007). *Limited choices: Anexploratory study on para□n use in Kwazulu-Natal*

Rea, Louis M & Richard A. Parker, (2005). *Designing and conducting survey research. A comprehensive guide*. Third edition. Chapter 1.

Sefton, T. (2002) *Targeting fuel poverty in England.*

Shackleton, C.M., Madubansi, M. (2006): *Changing energy profiles and consumption patterns following electrification in five rural villages, South Africa*. Energy Policy, vol. 34, issue 18, pages 4081-4092.

Spalding-Fecher et al. (2000). *Energy and the World Summit on Sustainable Development: what next?*

Weller-Molongua, C. and Knapp, J. (1995): *Social Network Mapping*; in Slocum, Rachel et al. (eds.): *Power, process and participation – tools for change*, Practical Action.

Winkler (2005): *Energy policies for sustainable development in South Africa*

Reports:

DOE (Department of Energy South Africa), (2012A): *A survey of energy-related behavior and perceptions in South Africa,* Republic of South Africa

DOE (Department of Energy South Africa), (2012B): *Non Grid Electrification policy Guidelines,* Republic of South Africa

DFID (Department for International Development) (1999): *Sustainable Livelihood Guidance Sheet*

IDP review 2010/2011

Modi, V el al. (2005): *The UN Millennium Project, 2005. Energy services for the Millennium Development Goals*. United Nations

United Nations (2007): *The Wye Group Handbook, Rural Households' Livelihoodand Well-Being. Statistics on Rural Development and Agriculture Household Income.* United Nations Publication

United Nations Development Program (UNDP) (2009). *The Energy Access Situation in Developing Countries: A Review Focusing on the Least Developed Countries and Sub-Saharan Africa.*

Web pages:

- ANC, 1955.The Freedom Charter.*As adopted at the Congress of the People, Kliptown, on 26 June 1955.* http://www.anc.org.za/show.php?id=72
- IEA (International Energy Agency): http://www.worldenergyoutlook.org/resources/energydevelopment/definingandmodellingenergyaccess/. Retrieved 20 march 2013.

APPENDIX LIST

Appendix 0: The colour codes

Structures & processes

Current use

Job & income generating opportunities

Economic aspects

Educational aspects

Security aspects

Health &nutritional aspects

Social network & Natural capital (Wattle)

Diverse: Implications in regards to the use of electricity/time

Appendix 1: PRA. Wealth Ranking

Saturday 02.03.2013

The wealth ranking exercise was conducted in the Chalet with 6 participants:

Puleng Tsalong,	26 years	BSc. In communication
Leffy Ramatlapeng, MoshweshweNtloma	24 years	Helps family with livestock
Luffefe Yalashiya	20 years	Helps father with Construction Company
Innocent Lecheko,	33 years	Travel guide and sand painter
Kholu Thekiso,	34 years	In charge of chalet since 2002

The participants are asked to discuss criteria for being a wealthy, a medium and a poor household according to how they perceive the different levels of wealth. The discussion is facilitated by Skylar and since the participants all speak fluently English there is no need for an interpreter. The discussion is rich and the participants are very engaged in the topic. Most of the discussion among the participants is in Soto, which is subsequently asked to be summed up in English. This means that not all aspects and details are necessarily being captured. As the discussion runs along the different criteria are noted on written on post-it notes – the criteria for being a rich household written on green post-its, for being medium household on yellow and for being poor on red post-its. Following the identification of the criteria the post-it notes are put on the wall differentiating the three levels of wealth. The findings are as follows:

<u>Wealthy Household:</u>

- House with heavy tile
- High fence

- Farming: home garden and/or field
- Livestock: horses/cows/sheep
- Generator
- Solar panel
- Car
- Fridge
- Tractor
- Cell phone
- TV
- Radio

Middle Household:

- House made from blocks, with/without tiled roof
- Corrugated iron roof
- Fence made from poles and wire
- Farming: mostly home gardens
- Livestock: horses/donkeys/goats/chicken/sheep/cows
- Solar panel
- Fridge
- TV
- Use gas
- Cell phone
- Radio

Poor Household:

- Mud house
- Thatched roof
- No fence
- No tap inside
- No toilet (before governmental program providing all households with a toilet)
- Livestock: pigs/chicken/cats/goats
- Use wood/paraffin for cooking, candles for lighting
- Radio

Notes:

- Even though a person may be wealthy, you may not see all of the objects in the household. E.g. being wealthy can also be because of having savings.
- Khodu: *"The poor are lazy. They think that they are always going to be poor, but they will always have the opportunity to move higher in society".*According to Khodu the poor don't take the opportunities to make money or get a better life, e.g. by farming, local projects, etc.

- Being part of a governmental project, for example fixing the roads, is not very attractive as these are perceived as being for “the poor”.
- Khodu: *“You can see on the children’s clothes and cleanness if they are from a poor household.”*
- The poor are struggling. Reasons for being poor are often single parenthood; that they didn’t go to school; forced to sell livestock.

Appendix 2: Problem Ranking

Thursday 07.03.2013

Intro:

We have strived towards a PRA problem ranking, with participants from respectively: two poor, two medium and two rich households, with a variety in age and sex. However one from a rich household did not show up.

The following inhabitants of Mpharans participated in the PRA:

Lorance (M) 36 years, Rich household

Bertram (M), Middle household

Ntabi (F) 26 years, Middle household

Kristine (F) 81 years, Middle household

Maria (F) 56 years, Poor household

Flora (F) 61 years, Poor household

They were asked the following question:

"On a community level, what are the most important things that you think should be improved?"

First they are asked to brainstorm, discuss among them and write down as many things as possible (which turned out to be 10 things). Then take the least important things away, leaving the five most important things on the list in a random order. In the end they are asked individually and anonymous to rank them in a prioritised order, with the most important think that they would like to be improved at the top.

First they discuss if it is the road or the electricity that is most important. Furthermore there is a general problem of shortage of medication. They discuss if they should include water as it is an issue which is about to be fixed.

The first thing that Lorance mention is education and homes for elderly. There is an agreement about implementation of a high school. The plantation is also being mentioned, as there is a project around the plantation, but they are missing equipment to be able to cut the trees. They also miss tar in order to treat the poles for them to last longer.

The arguments for the 10 mentioned things that they would like to have improved are:

Electricity:

- Cheaper than paraffin and wood (counter argument -they will however continue to use wood as it is cheaper and better…)
- With electricity there is no need to pay for petrol for the generator.
- Healthier that paraffin and wood –no smoke.
- Generating income through jobs and business. By creating jobs the children do not have to move away from Mpharane, but can do their businesses here, for example: Sowing, and chicken farms (the white race need heaters). Lorance have quite a few ideas: Butchers lab, Printing logos on close, freezing dead people.
- In regards to pay a builder –it would be cheaper if he could plug his work tools into a power plug, then you will not have to pay for the petrol for the generator that he brings with him as well.
- Use the TV for educational programs, so that the children can learn
- Streetlight is perceived to minimise crime.
- It will safe time not having to collect wood.
- They will be able to operate the machines at the clinic.

Road:

- Minimise road accidents
- Minimise maintenance on the cars, which would make the transport cheaper, since those who have cars charge more because of maintains.
- Less use of petrol for the cars
- It would be easier to drive with busses, and not having to use pick up trucks. It is only those who sit on the front seat who are insured if something happens.
- It is hard if you have to go to the hospital, and the ambulance is slow
- Ntabi is considering to buy a car if the roads will be made

Education:

- Workshops for the teachers so that the level of teachers can be improved.
- People with learneing problems should have alternative possibilities to avoid that they are thrown out of school because of their age in the end.
- Teachers take their children to school in town and only come once a week to teach in the rural area.
- Teachers teach in Soto in stet of English –only black people are teaching here.
- The children only learn though talking. It is better if you can actually see the things you want to learn -they can't see a real globe for example.

Work/Jobs:

- Needs of equipment for the project in the plantation.
- More information on available jobs –they do not hear when there is an available job (bad communication). They also want to be consulted about the work on the roads.
- They are not happy with the political situation in regards to jobs –political favorism: If you belong to a particular political party you'll get the job.

Clinic:

- There is a need for more nurses. The nurses have to work a lot.
- There is also a need for more medicine, and for a fridge in order to stall the medicine and the vaccinations for the children.
- There is no access to the 'machines' -you have to travel to Matatiele.

Old age home:

- The old people are being raped at home because they are home alone. It would be sager if there were a home. They also get their pension stolen at night.
- If you are sick, it is better if there is someone to look after you. Often the children are away working in other cities.
- Someone to cook for them.
- Many needs treatment and someone might take the wrong medicine leading to overdose.

Security:

- There is a need for more police patrolling, they are not doing their job probably: They stay at the station and do not come out when there is a crime, so you have to witness it all and tell it to the police.
- They are no longer using the security cameras.

Water:

- Sometime they are out of water
- There is an inequality in the distribution of the water, some gets others don't.
- They do not know what is happening in terms of purification.
- Even those those with water tanks needs purification

High school:

- They would like to have a high school, so that the children do not have to go somewhere else – they want their children to stay. It cases dropouts.
- They also have to pay for the food when the children are away.

Project at the plantation

- There is a need of education about trees and planting. Better skilled people could also lead to making use of the trees for furniture.

The five most important topics are prioritised to be:

1) Electricity
2) Jobs
3) High school
4) Roads
5) Old age home

Appendix 3: Video interview

Thursday 07.03.2013

The video interview is conducted right after the PRA Problem Ranking. The four participants in the video interview have all prioritized electricity as the most burning issue in Mpharane. They are therefore asked to argue for reasons why Mpharane should become electrified:

"If you should argue for why Mpharane should be electrified, what would your arguments be?"

Maria (56 years):

- *"We want electricity in Mpharane for the reason that we want our children to be able to start businesses, so they can stay in Mpharane, because when they have to look for jobs elsewhere it cost their parents money."*

Kristina (81 years):

- *"We want electricity because for those of us who are old electricity can help us a lot in terms of cooking and for light. And as well because the paraffin is expensive."*

Nthabi (26 years):

- *"We want electricity because Mpharane is being oppressed and we want development here. It is much easier for children who have electricity to learn than for those without. You can for example see learning programs on the television."*

Flora (61 years):

- *"We want electricity here in Mpharane, so we can have lights. If there is electricity and thereby light it can reduce crime. It can also improve the learning facilities for the students."*

Appendix 4: Open Interview with Wilhelmina P. M. Moslesh –'the gas supplier'

Saturday 02.03 2013

Intro:

Previous Nurse Educator, Nursing Collage. Now retired and active in charity work with HIV/AIDS patients and other terminally ill patients in their homes. She is also one of the people who report to the community if some people can be categorised as 'being in needs'.

Her and her husband are known in Mpharane for selling the gas, which they have done since 2005.

Processes & structures:

She has personally written applications to the municipality in order to be provided with grid electricity and are expecting to get it here in 2013. Since she is a part of the missionary church and conducting charity work she is able to come with many arguments for the church to become electrified. (However, she is saying that it would make no difference if everybody were writing).

Perceptions and importance:

She recon that those who have gas will keep it even tough they are provided with grid electricity, since it is easier to manage and more reliable as: *"You are not risking to loos business if there is a power cut."*

However it will be cheaper to use grid electricity than the generator: *"With grid you only use what you need"* (easier to control). With electricity everything will be faster and you'll be able to use it for light, fax, telephone, cooking and security –light would reduce the problem of youngsters robbing and raping.

Current use & implications:

They buy gas in Matatiele and sell about 2-3 of the big 19 kg gas cylinders a week in Mpharane. In wintertime it's only about 1-2 since they primary are used for fridges in small businesses such as those who sell chickens and beers. They are not selling to the supermarket though. Normally a 19 kg cylinder last for about three weeks.

They don't see it as a big business, they are manly just helping the elderlies with the gas supply. They charge 380R for a big gas cylinder: *"It is very cheap, it is more like a charity".*

Very few use gas for heating. Most people have paraffin heaters.

New stoves that use paraffin gel have just arrived. It is the very pore people 'those in need' that gets the gel. The gel is safer than the paraffin.

Other good stuff:

Health: She recons that there are no health issues in regards to making fire places inside the house since the smoke goes out the door and people make sure that that the firewood is very dry and therefore doesn't smoke so much.

She is very proud of being rural: *"If just we had the roads fixed and were provided with electricity we'll be like kings!*

Appendix 5: Open interview with Tilo Liphapang

Tuesday 05.03.2013

Intro:

Tilo is a retired secretary from University with a BSc in Art, he is an active member of the community (and member of African National Congress) and also rather wealthy with a pension on 12,000R a month. He has lived 30 years in Mpharane.

Processes & structures:

Previously it was the chiefs who were responsible for the administration. Since 1994 it is no longer under the chief but now under the local counsellor. It is the municipality that administrate the water, the road and electricity.

The municipality has asked him to write an application to the national government in order to get money to install electricity in Mpharane through Eskom. There has been made a budget for the electricity to come in 2013-2014, more specifically they have been promised that in July the deposit will come through: *"Our time has come that is why we are so eager!"*

The reason for Mpharane not being electrified is that there is a shortage of money (in some places the money get misused but he does not think that it is the case in Mhparane).

Perceptions and importance:

He is missing electricity: *"We are just praying for getting electricity, if we'll get it, it would be the best ever."*

He has been waiting for electricity since 1994: *"We need electricity!"*

Current use & implications:

Before coming to Mpharane he lived in Matatiele, which means that he has been used to have electricity. Around 1994 he spend about 300-500R per month on electricity (well knowing that the prices have gone up. He used it for the stove, gasser, fridge, TV and radio. Now he has a generator and solar panels to cover his electrical needs.

He has more than 100 ewes in the mountains that he may sell if he needs some extra income (savings)

Appendix 6: Group interview in Queen's Mercy.

Wednesday 06.03.2013

Intro:

In order to gather information on the influence of electricity, we chose to make a group interview with inhabitants in Queen's Mercy, the neighboring electrified village. We asked our interpreter to organize a group consisting of 5-8 people for the meeting, since she is from Queens Mercy and her mother lives there. 20 people eventually showed up, 8 men and 12 women (participant list at the bottom). The interview turned out to be rather superficial and as a result we didn't obtain in depth information.

Processes and structures:

The village has been connected to grid electricity since march 2011 and the previous councillor was the one involved in the implementation. The community didn't participate in the decision process. Unfortunately the councillor involved passed away. The people as a community had many meeting among other things covering the issue of electricity before the implementation, but the application was sent from the councillor to the municipality of Matatiele. The poles are put up by Mnambiti.

Ladysmith? It took 10 years from request of energy to the actual application was sent. The participants think that the implementation of electricity took so long for political reasons.

Every household is connected to the grid. There is no connection fee and Eskom is in charge of the maintenance and reparation. They have to call themselves though if something needs to be fixed.

The best advice from the participants to Mpharane for getting electricity: It depends on their councillor, which means that they should consult him. It is a political matter according to the participants. *"It is always political!"*

Perceptions and importance:

Access to electricity is perceived as an essential factor for the participants, since it makes everyday life a lot easier and faster, especially in relation to cooking, preparing in the morning, watching TV, charging phones, etc.

2 ways of triangulating the question "what is most important with having electricity":

- Most important investment in equipment after installation: Women: kitchen, stove, microwave, toaster. Men: equipment for hair and grass cutting.
- Biggest problem with not having electricity: Not possible to watch TV and charge the phones and lack of opportunities to make business.

Current use & implications:

The participants are very satisfied with the current energy use. They think it is expensive for electricity (when asked whether they think it is expensive there was a lot of mumbling and laughing).Nevertheless they still think the cost of energy sources is lower now than before the implementation of electricity, since the electricity is a lot cheaper than paraffin. 100 Rand last one month approximately and they are very satisfied with the grid electricity supply (great agreement in the group). The payment of the electricity is done by prepay card, which are bought in the

supermarket.They don't receive subsidies from the government, electricity is delivered from the municipality? They do get a small discount on the prepaid cards (buy for 100 Rand, get 20 Rand for free). They don't feel that the energy prices changed that much? No one uses electricity without paying according to the group; every household pays for their own electricity (no illegal uses). They are honest people!

There have been a few problems with the electricity, e.g. when it is snowing, very windy or raining there might be power cuts, which could last from hours to days depending on the cause (one week if caused by snow, one day if caused by rain/lightning). In these instances they use paraffin instead of electricity.

There is a problem with people doing damage at night the electrical equipment; the wires are cut down.

Different sources and uses:

- Cooking: electricity or firewood if there is no stove or appliances
- Light: electricity
- Fridge: electricity
- Heat: electricity or paraffin heater (before they used paraffin and wood)
- Phone charging: electricity
- Radio/TV: electricity
- Iron: electricity, some use paraffin

Solar panels: No use, only if there is power cut. They are cheap, but an unstable source of energy depending on the weather conditions.

They still use wood and therefore the business for those selling wood is unchanged. Wood is collected by themselves around the village or bought: 300 Rand for a cow load, 950 Rand for a tractor load. NB! Electricity might make a bigger difference here than in Mpharane since there it is much easier to collect wood?)The participants prefer electricity as a source of energy since everything is very quick and easier when using this. It is difficult with the use of wood; hard work and when it is raining the wood gets wetand it is not very nice to stand outside cooking.

Why still old uses? To save electricity by the use of wood, but mostly for those who collect the wood themselves.In summer this is easier, the place is not very far away, but in winter it is difficult. Also to cover the needs during a power failure (they use e.g. paraffin, candles and solar panels).

There is a big difference between before and after the implementation of electricity. *"Electricity changed our lives"*. The most important change is that now they can watch TV. This is important, as it is now possible to get news from overseas. Another change is that now the phones can be charged for free. In important change is that everything is easier and faster now, e.g. cooking, light, etc. Activities in the morning are faster, e.g. boiling water.

- Income generating activities: Not in this room, but there are some: Barber shops, wood cutting, welding
- School: No real influence on the school. (Maybe because they haven't implemented many electrical device at the school yet, since these things take time and money – see interview with QM school principal)
- Health: quality of treatment: same. Improvements in possibility to keep vaccinations cold and in storing blood for donation. Some issues with the eyes when using paraffin, which has become better after implementation of electricity.
- Crime: right now they still don't feel safe, since the lights are still only in the houses and maybe that doesn't make such a big difference. They would like streetlights to improve security.
- Food: Now the food can be put into the fridge and leftovers can be saved. They eat more meat now that it can be saved and stored cold (before is was app. once a month, now it is every day).

Other:

They would prefer electricity to a new road, even though the road is a very important issue. The ambulances are slow on the roads and transport is expensive because the cars are in need for maintenance more often.

There will be a bigger difference between rich and poor since the poor would still after installation of electricity not be able to buy devices or electrical equipment. Some of the poor households only use the electricity for lighting and therefore the benefits are less for the poor.

Participants:

	Age	Occupation
Men		
	32	Peace job
	25	No
	49	No
	24	No
Women		
	50	No
	72	Pension
	45	No
	65	Health care worker
	56	No
	58	No
	61	No
	1944	Pension
	1931	Pension
	55	No
	25	No
	29	No
	32	No
	3	No

Appendix 7: Semi-structured interview, School principal, Primary school, Queen's Mercy

Wednesday 06.03.2013

Intro:

He has been principal since 1992.

Processes & structures:

First they were provided with solar panels in 1997, with a second installation of a 7 solar system in 2005 from the department of education (a group from Cap town).

Now they are provided with electricity through Eskom for the 3th year. *"A company came with electricity."* They are also paying with a prepay card. It took many years for the implementation. -5 years between the previous village was electrified to the time when Queens Mercy was electrified.

Some villages also experienced that power cables just pass though without supplying them with electricity: *"It is understandable that they do not understand."*

Perceptions and importance:

After the installation of electricity, they feel safer since they can have the light on all the time reducing theft which they had a lot of problems with before the electrification.

The electrification has improved the possibility for the students to read at home: *"You don't have to share the only paraffin lamp which is in the house with all the others".*All houses in Queens Mercy is electrified, which means that many of the students are also able to watch TV and see the news at home, which will make them more informed. It increases their learning skills when they are able to learn visually*: "They can for example see what an earthquake actually is."* He considers TV as a main change.

Electricity has also shorten the preparation time at home in the morning which means that the attendance at school has improved.

Electricity has also made it possible to run evening classes at the high school since they are able to have the light on in the evening. Implementation of computers and internet is also going to improve the teaching, however this opportunity is currently not in use since there is a big issue regarding

teachers not being qualified to use the computers: *"We are still left behind. The teachers do not know how to use the computers. At other places 10 year olds know how to use computers."* His hope is that eventually the students will also have access to computers.

Current use & implications:

Previously they were able to run the projector as well as the light on the solar panel but having electricity means that they are able to work with the light on all the time. Still they are keeping the solar panel for when there is a power failure.

They are using electricity for the computers and photocopying for example for question papers.

Since there is a 'Feed Scheme' where the school is providing the children with food, electricity is also used for keeping food and especially meat for longer periods of time. For the cooking itself they still use gas though, since they have been supplied with gas stoves from a governmental project.

Other good stuff:

While we conduct the interview there is a power cut. The principal does not notice or at least does no react at all which indicates that it is something which occurs on a regular basis.

The government is in charge of the inspections of the electricity, but the principal suspects that they don't do it.

Appendix 8: Semi structured interview with the principal at Mpharane primary school

Tuesday 05.03.2013

Intro:

Mr. Moshoeshoe has been principal at the school since 2008.

Processes & structures:

According to him there are different levels in the management of the electrification process. The national government is providing funds for electrification to Eskom and to the municipalities. On the community level the ward councilors and chiefs are responsible for taking care of the needs and wishes of the people and are being the link between these and the local and national governments. The principle is a member of a committee that has been put up to discuss the issue of lack of electrification of Mpharane and to work for pushing the process of implementation. On the 26th of February there was a municipality meeting where it was communicated that *"all things are ready"* for installation of electricity in regards to the funds from the national government*"but no one knows where the funds are"*.*"The municipality blames Eskom"*. The committeehas sent applications and letters directly to Eskom with signatures from teachers, school principals, people from the tourism trust and community development project enquiring about the installation of electricity. On the 4th of September 2012 the committee sent a humble reminder on the application they sent on the 29th of September 2009 for The Manager of Eskom in Durban, but they have not yet received a response. Registration numbers should be put on the houses once electricity is coming, but there is no sign of that so far. The principal does not know when to expect electricity in Mpharane, since *"it is complicated the way electricity is delivered"*.

Perceptions and importance

In general electricity will be crucial for the school in operating teaching and learning. If the school receives electricity the teaching and learning facilities will be improved. The teachers will be able to use overheads and CDs as teaching resources. In general electricity is perceived as a teaching resource. The school will not be dependent on the natural light, and therefore there can be light every day also on dark, rainy days. Furthermore it will be possible to have light during functions. Electricity will be used in the office which would enable more efficient uses than when being provided electricity by a generator and the uses of more, important, equipment e.g. printers, scanner and fax machines. The school will be

able to use Internet for external communication e.g. emails and it will open up for the possibility to get access to information, both national and international news, policies regarding education and teaching, subsidies etc. In addition Internet will play an important role in relation to the quality of teaching and learning. The students will gain access to Internet, information and news and they will have references and can learn to integrateinformation from the Internet in problem solving and assignments.

Another aspect of electricity is in helpingto improve the feeding scheme at the school. Currently cooking is done with gas and fire (outside for the fire), which means that it takes a lot of time to prepare food for 400 pupils. With electricity it is predicted that the time spent on cooking will be reduced significantly.Additionally the food can be stored which will also make it possible to prepare meat more often.

Current use & implications:

The electricity needs of the school are being covered by a generator driving the electrical equipment in the office e.g. the principal's computer. They have a big solar panel, but it has not been working for approximately 2 years. It is the schools own responsibility to get the solar panel fixed, but this is very expensive, around 20.000 Rands, and the money is not there. Furthermore the batteries for the panel are old and inefficient and therefore also need to be replaced. The school is responsible for the reparation but the Department of Education is supposed to distribute funds for the school and funds sufficient for repairing the panels have not yet reached the school. Another complicating factor is that the panels are liable to theft and therefor it is not necessarily worth the effort and money to get the panels repaired.

The lack of electricity means a lack of teaching and learning resources. E.g. the teachers cannot use overheads and there is no light in the school. The lack of light is a problem when it is raining and snowing and dark outside and especially an issue in regards to the security as the night caretakers have to use candles and torches when they are guarding the school at night time.

Appendix 9: Semi-structured interview with the nurse at the clinic in Mpharane.

Tuesday 05.03.2013

NOTE: Time was very short as we hadn't made an appointment. Therefore the interview was short, and some of our questions were skipped. The limited time resulted in a rather superficial interview and a lack of in depth information.

Perceptions and importance:

The biggest issue in relation to the lack of electricity in Mpharane, is, according to the nurse at the clinic, rapes in the village. Because of a lack of light in the houses and in the streets, people can easily snoop around without ever being noticed. During night time criminals can enter houses, especially elderly's property, and theft and rapes of both elderly women and small children are typically occurring. In some situations people dies as a consequence of the crimes.
"The people don't feel safe!".

When asked if she is expecting to get supplied with grid-electricity, she strongly agrees. The nurse "Correct me if I am wrong, but schools and clinics should have electricity, right?"
The greatest improvement in relation to the clinic is that electricity will allow more examinations and surgeries to take place in the clinic.

Current use & implications:

Right now there is a complete lack of electricity generating sources in the clinic. The clinic had a solar panel, but it has been stolen. The nurse don't know when exactly, but is hasn't been there the time she has been working in the clinic (since feb. 2012). The clinic has no generator.

"We have all the electrical appliances, but right now they are just serving as decoration!"

The municipality has been informed about the lack of electricity, but so far nothing has happened. Though, last week a gentleman came and he promised that the solar panel would be replaced within one or two weeks.

The lack of electricity causes severe complications in the clinic and its services to the community. As there is no electricity, there is no light in the clinic, the nurses are unable to perform various examinations and operations and medicine and vaccinations can't be kept cold in a fridge. A lack of running water is also a great issue resulting, increasing the risk of disease spreading.

When asked about the most typical and frequent occurring health problems in the clinic, the nurse answered as follows; HIV, TB, asthma, Epilepsy, hypertension and diabetes. In relation to the currently used energy sources, the nurse only mentioned skin burns as a result of paraffin uses. Problems like these are most often seen during winter time and especially children seem to be a risk.

The relatively high incidence of asthma might be related to the energy use and sources, though the nurse isn't sure.

According to the nurse the community has been informed on the issues relating to the current use of different energy sources, and therefore they are, says she, aware of the problems in this matter.

The way information is communicated to the community is through daily participatory seminars in the clinic. The participants are the people visiting the clinic on that particular day and every morning a new topic I discussed.

Appendix 10: Semi structured interview with our translator Puleng Tsalong

Friday 01.03.2013

Intro:

Puleng is 26 years old and holds a BSc in Communication. She grew up in Queens Mercy and lives now in Mpharane and is about to set up a new radio channel for the rural population.

General on education, work and income:

Human capital

- Children go to school from 6 to 18 years of age. It is possible to attend school up to grade 9 in Mpharane then you'll have to go to Queens Mercy to reach grade 12.
- Most of the people in Mpharane do not work. There are a lot of migrant labourers; about half of the men in Mpharane work in the mines, railways or farms in Johannesburg or Capetown from when they are 18-20 years old. They only come home once or twice a year.

Economic capital

- General sources of income: Cooking, cleaning, sewing, washing clothes (women), watching animals for other people (e.g. take cattle from 5-6 households to the mountains and earn around 200R per household per month), tourism (not every month though, only when possible), teaching, remittances (see former bullet point), support or grants from government:
- There is a child support from the government of 290R per month if they go to school. Some girls drop out of school and get children in order to earn money on this support.
- It is possible to get governmental support of app. 500R per month by engaging in projects like maintenance or constructionof the roads, fire fighting, maintaining the plantation, etc. This is mostly or the youth.
- An old age pension of 1200R (1260 from April) is given to female above 60 and male above 65 years old. This is also the amount for governmental disabled support.
- Those who have a lot of moneyare because they have children sending money home from Johannesburg or because they have an education and a proper job, e.g. teaching.
- The man is the head of the house: *"'I'm working so I'm deciding what to use the money for"*

- The money is handed out at the community hall as . Those who have a bank in Matatiele go about once a week to the bank.
- The governmental bus to Matatiele costs 15R (old people can take the bus for free -probably pension). Puleng perceives old people to be those above 40 ears.

General on energy use:

Physical capital

- The government supplies 5 litresof paraffin gel per month for 'those in need'. You have to register at the community hall and be approved as being 'in need' to get it. There are social workers looking for people in need in Mpharane.Pulengdoes not think that there is enough paraffin gel available.
- People mostly cook outside on a fire. Some just have a fire in the middle of the house for heating and cooking. In the wintertime many are cooking inside.
- Wood is collected by people themselves, with tractors (800R, lasts for app. one month) or cows (300R). The collection is mostly done by men or boys since it is hard work and also *"it is not safe for woman to go to the mountains to collect wood"*. Furthermore it is a cultural thing; the women cook and the men collect the wood; *"the woman have to cook in the house"*. Only the poor women collect wood themselves, 3-4 women may gather about once a week in the morning from 6am-11am to chop the wood.
- A few people have a water geysers or a generator which is very useful e.g. for welding.
- You can get your cell phone recharged by those who have a solar panel –they charge 5R.
- Gas is used for cooking and some are also using it for the fridge – but it is expensive: 500R for a cylinder that last about 3-5 month. *"The guy who sells the gas is wealthy, he has a car, generator etc."*

General on electricity:

- *"There is a need for electricity!"* The counsilor has promised that Mpharane will get electricity by September 2013.
- Electricity is a big issue in Mpharane; people talk very much about it. It has a lot to do with the neighbouring village, Queens Mercy, since they got electricity a few years ago and the people of Mpharane are jealous about that and do not understand why it is *"just over there"*. Electricity was implemented in Queens Mercy in 2011 and the installation was for free.
- *"Electricity would make life a lot easier"* and could be very useful, e.g. for the chalet and the clinic. Also for water, ironing, radio/TV, cell phones, cooking, etc.
- The electricity would be paid by prepay (as in Queens Mercy), and you could buy for 100R and get 20R for free.
- People would probably continue to use firewood even though they get connected to grid electricity to save some expenses on electricity.*"It is a waste of grid electricity to use it for heating."*
- The biggest need for electricity is for cooking, lighting and as a means of innovation, e.g. for opening small businesses like saloons, small shops (more stability with electricity), hair dressing, sewing (possible to have machines) and for special youth initiatives. Solar panels would not be efficient enough;*"If it rains there is no business"*.As well for the schools electricity would be very beneficial; here it could be used for e.g. computers.*"So you see, with electricity there's a lot you can do."*

Health issues in regards to the current energy use:

- Puleng is not aware of any health issues besides that it can be dangerous for the children to touch the paraffin lamps and that the candles can catch fire and cause burns.

Conflicts in regards to electricity:

- People talk a lot about getting electricity. They drive together in the bus with those from Queens Mercy who have grid electricity: *"It can cause anger in the people from Mpharane"*.
- Solar panels have been stolen and electricity poles have been cut down: *"Imagine if your neighbour had electricity and you don't."*
- "It will cause trouble if only the school gets electricity as people will see wires passing over their house".

- The government decides who gets supplied with grid electricity, but there is a problem of local corruption:*"Local officials sign "contracts" from the government to get funding for installation of electricity and "steel" the money!"Maybe the government thinks that things are alright in Mpharane, that there is electricity."*

Information and communication:

- There is a community meeting twice a week for everyone to attend and where people can raise issues, but: *"People are tired of promises in regards to getting electricity and the road tarred, so they are not attending anymore."*
- *Communication is important, if the community is told that electrification is in progress they would be alright"*
- The radio (Alfred Nzo radio) is the news transmitter, but only local news and information. A few have TVs driven by generators.
- Some have cell phones with data; they use the Internet to chat and to find jobs. A good idea would be to hold information workshops providing information on how to search for jobs with the use of mobile phones.

Governmental programs:

- It is possible to get support for grid electricity but not for solar panels.
- There is an on going governmental program, ABED (Adult Based Education), teaching old people to read and write
- The government also launched feeding scheme project were children get food in the school everyday.

Appendix 11: Semi structured interview with the Councilor Padi Ntsolo

Wednesday 06.03.2013

Intro:

Padi Ntsolo has been the ward councilor of Ward 13, including Mpharane, since 2006.

Processes and structures:

According to his explanation the political structure in relation to electrification in the ward is as follows:

The highest authority in the decision-making processes is the Department of Energy in the National Government, who is distributing funding for electricity to the part governmental monopolous energy company Escom as well as money to the municipality. The municipality then works together with Escom to install electricity. In the municipality of Matatiele there are 26 ward councilors who debate different issues and decides and priorities different projects. The three main programs are currently water, roadsand electricity.Once the funding for installation of electricity is provided to Escom they are in charge of distributing electricity to all the households, which means that there is no connection fee for a small meter which can cover color TV, radio, fridge, cooking. If a household wants to be able to run a water geyser, four plate stove and heater they will have to pay 2000 Rands for a big meter.

Community meetings are being held twice a week were the inhabitants can come up with issues and requests for the councilor. *"At every meeting electricity issues are raised by the population", "Electricity is a burning issue".* These issues are being noted by the councilor and discussed with officials from Matatiele municipality. On this basis an annual IDP (Integrated Development Program) report is being conducted involving the needs and wishes in the 26 wards. In the IDP it is stated that there is great need for the roads to be made and water and electricity to be distributed. These needs have to be prioritized and the budget has to be divided among the 26 wards. *"We have to wait for funds, but have to keep on fighting."* Electrification is a high priority for most of the ward councilors as not even half of the ward areas have yet been electrified. It is a challenge to prioritize the issues in the different ward areas, since there is a fight for which issues are the most urgent.*"Some places do not even have water,*

they have to go to the river to drink". The secretary noted that *"you have to fight for your matters of interest but maybe he's too soft this one"*.

Application for electrification has been an ongoing process since 2000. The two main obstacles in the process of implementation are a shortage of money in the community budget provided by the local and national government and insufficient power production from the power stations. There are two main power stations, Kusile and Mitupi, providing the area with electricity. These were improved in 2008. The power station that provides Queens Mercy with electricity also has the capability to provide Mpharane.According to the councilor the implementation work will commence in July since the budget has been approved.The reason why Queens Mercy has been provided electricity and not yet Mpharane is to the councilors conviction that it is about funding and that the electricity has just not reached Mpharane yet. They are next in the line.

Alternative programs:

The councilor is aware that an NGO was given tender by the municipality to supply the inhabitants of Mpharane with solar panels. He does not remember the name of the NGO. It was a five-year program but was not sustainable and could only be used for a few things like black/white TV and radio. The inhabitants were supposed to pay 55 Rands per month, but the government could subsidize this amount. The councilor does not feel that he was properly informed and information was not provided to the inhabitants.

Another alternative program is existing in Mpharane were people in need can be provided with paraffin gel and a gel stove. Currently 166 households are registered as being in need. These registered people will be provided with governmental support consisting of 55 Rands once electricity is installed. There are 10 ward community members from each village who evaluates whether a household is in need. This appraisal is based on the type of house, if they have any livestock and on the income, i.e. if the household is only depending on governmental support.

Wattle eradication:

There is a plan for eradicating wattle in the area. The argument is that it is consuming a lot of water and has an uncontrollable growth pattern. *"Wattle is invading our inhabitants!"* However he acknowledges that it is an important energy source for the inhabitants, but thinks that eradication or an effort to control the spreading of wattle will not be a problem since there is still free firewood in the plantation and a long the river. *"We need it, but it must be controlled." "We are not going to take all the wattle."*

Appendix 12: Semi-structured interview w/ Headman of the sub-village Tababsien, Naha Jane

Friday 08.03.2013

Processes & structures:

The councilor is responsible for implementation of electricity in Mpharane and the municipality will be in charge of installing electricity in their households. The inhabitants have not enquired about the process of electrification to Mr. Jane, these enquires are taking place at the community meetings. He does know that there is a plan of electrifying Mpharane by July 2013.

Mr. Jane never heard of a program regarding providing solar panels for the inhabitants of Mpharane. He has heard rumors though (when we asked again), but never saw any action. As far as he recalls the discussion about providing solar panels was in 2008 or 2009, but he is not sure since it is a long time ago. Even though these rumors existed, no one in the community wanted solar panels. He does not know the exact reason for this, but his personal opinion is that providing solar panels is an unsustainable solution and that it is not worth the expense in terms of its instability.

Mr. Janedoes not have any information on the project of providing the people in need with paraffin gel. He also did not experience anyone asking him about the matter.

It has been agreed that wattle should be removed. The argument is that *"it takes a lot of water, even in the mountains"*. The wattle also causes problems to animals; the inhabitants want pastures for the livestock. He does not think that eradicating the wattle will have an influence to the people; there will still be enough firewood.

When asking Mr. Jane about his responsibility as a headman of the sub-village he answered quarrels among people, water sanitation, enquires about burning issues like the road and electricity! People do come to him with questions about electricity. When this occurs he refers to the councilor or chief.

NB! At the end of the interview Mr. Jane laughed, stretched his arms together in front of him and asked if we were going to arrest him now!

Appendix 13: Semi-structured interview with Tsepo

Sunday 3rd March

Intro:

Tsepo is coordinator from the tourist trust.

Processes & structures:

The main reason why there is no electricity in Mpharane is because of the politicians at Matatiele running the programme IDP (integrated development Plan) This is the same reason why Queens Marcy got the access to grid power on 2010-2011 and Mpharane is still waiting for it (2013)

The MAJOR is in charge of bringing electricity to Mpharane

The process to get power line starts by a writing and oral complain from the villagers, followed by a formal complain from the councillor to the Major in Matatiele, who came to see the reality with his working group.

Eskom is in charge of bringing grid to Mpharane. The process starts by the government who ordered Eskom this duty, followed by Eskom subcontracting the work to some other small companies. This last step is where corruption might be found.

Eskom is responsible for the maintenance of the grid.

No connection fee.

Once connected to the grid, people have some free electricity.

Perceptions and importance:

He considers electricity would be much cheaper than buying the paraffin, gas for the fridge or petrol for generators.

The only supply for the government is for those receiving old age pensions (1300 rands). They can receive stoves and gel (5 litres).To registrate for this, they need to contact the wrad clerk, who is a woman working for the councillor for registration work.

Current use & implications

He also reckons people would still use firewood, because…

Appendix 14: Semi structured interview, ”rich” household, Queen’s Mercy

Sunday 03.03.2013

Processes and structures:

She thinks that she has been provided with grid electricity since 2011. They were not home when the electricity was installed (the grand son lived in the house at that time) and does not fully understand how it was done. There is no installation payment; the government takes care of that. They have to call themselves though if something needs to be fixed.

Current use & implications:

The payment of the electricity is done by prepay card. The cards can be bought in some garages in town. If you buy 400, you get 160 Rand for free. She thinks that electricity is definitely worth the expense; it is not too expensive, more expensive before. You can also regulate your own use, e.g. they switch off the electricity and use solar panels. Current spending on electricity is around 300 Rand per month. There is no difference between summer and winter since they don’t use electricity for heating.

Problems with the electricity: they can’t use everything at the same time, e.g. the heater and stove. And when it is raining or lightning there might be power cuts, this is not often though (once in 2-3 months). *”They”* come and fix it, comes back in one or two days.

Different sources and uses:

- Cooking: electricity or gas, firewood if they are having a brae
- Light: electricity
- Fridge: electricity
- Heat: gas/paraffin heater (electricity is too expensive for heating)
- Phone charging: electricity
- Radio/TV: electricity

- Iron: electricity
- Also has microwave, washing machine, etc.

Before:

Solar panels: mostly used before (had it for 5 years)

Fridge: gas

Water: had geezer for heating water

Bought firewood from forests (people bring with tractors; 700 Rand per load)

No one here collects wood themselves (!), buy it from Mpharane and bring it here. Some comes from oxen; this is collected nearer to the village.

There is a big difference between before and after the implementation of electricity. The living has improved in that everything has become easier. You don't have to cook outside when it's cold and takes a long time. They have a shower, bathroom and an electrical geezer. There is also now the possibility to watch TV, which is good for information. *"It's a very big help".* No big changes on community level though.

- Health: ?
- Crime: Still no street lights. The other villages have to get electricity first.
- Food: Now the food can be put into the fridge.

Other good stuff:

- There is a problem with people (from Mpharane) doing damage at night to the electrical equipment because of jealousy; the wires are cut down.
- She doesn't know if they asked for electricity in Mpharane.
- Everyone benefits from the electricity, even the poorest. People who can't afford much buy mostly for 1. lighting and 2. cooking (stoves)
- Quote: *"They have very nice houses in Mpharane, the only thing they miss is the electricity".*
- If electricity was cut for a week they would go back to the old means of coping. Mostly would be problematic because of the fridge (meat would rot) and because they are so used to the electricity.

Appendix 15: Semi structured interview, ”poor” household, Queens Mercy

Wednesday 06.03.2013

Intro:

Paulina Linyane is born in 1976

Processes and structures:

Paulina does not remember how long she has been connected to grid electricity. The counsilor was the one involved in the implementation; she didn't have any influence on the decision process. Eskom took care of the implementation and they fix it as well if there are any issues with the connection. There is no connection fee.

Current use & implications:

The payment of the electricity is done by prepay card. She spends less money on energy sources now than before the implementation of electricity, since the electricity is a lot cheaper than paraffin. Spends 120 Rand pr. Month. There are problems with the electricity; when there are heavy rains or snow there might be power cuts, doesn't happen very often but can last for 2 weeks.

Different sources and uses:

- Cooking: electricity or firewood for saving electricity (she collects once pr. week for 2 hours)
- Light: electricity (this is the most important!)
- Fridge: No
- Heat: wood
- Phone charging: electricity
- Radio/TV: electricity
- Iron: No

- Solar panels: No
- Main difference between now/before: paraffin used for cooking before, light.

The participants prefer electricity as a source of energy since everything is very quick when using this. It is difficult with the use of wood; it is hard work and when it is raining the wood gets wet and it is not very nice to stand outside cooking.

There has been a lot of change since the implementation of electricity. Before she spent a lot of paraffin (5 Litres per month). It is easier when having light at the night (not just candles/paraffin). Cooking is also easier for a lot of people with the bigger stove. She didn't buy new machines though (?).

- Health: She has some health issues (coughing) with smoke from the fire
- Crime: She feels safer since there is light in the night.
- Light: Activities can be done during the night, e.g. cleaning, which is good since it is cooler.

Appendix 16: Semi-structured household interview, Nthabi (middle HH)

Friday 08.03.2013

Perceptions and importance:

If the household was supplied with electricity Nthabi would like to start a small saloon to generate income.

The first thing the respondent would buy if the household was supplied with electricity is a hot plate stove. Cooking with electricity is assumed to be easier and faster than using the current energy sources. The respondent would stop to use paraffin, as it is expensive. The respondent would not be able to buy the appliance right away, but will need to save money for one month.

The next thing the respondent would acquire is a color TV. The TV is thought of as an educational tool asthe children will be able to see educational TV-programmes and follow both national and overseas news. To save up money for at color TV the respondent needs two months.

Another great influence of electrical supply is electrical light in the house. Lights will enable the children to study after sunset and thereby improve learning and education.

Furthermore lights in the streets, will improve the lives in relation to a reduction in theft.

Current use & implications:

Currently the respondent prefers to use a gas stove for cooking. The reason why is that it is perceived as being the fastest method and there is no smoke and smell released using gas.

Even though gas is the preferred energy source for cooking, firewood is the source used most frequently. In this household the kitchen is equipped with an oven, allowing the respondent to cook with firewood inside. Firewood is used mainly because it is cheap, as it the respondent collects it herself in the close surroundings. Firewood is perceived as the slowest method to cook, why gas and paraffin is preferred over wood. Paraffin is then used for cooking, for the purpose of saving gas when necessary.

Other:

Meals

- Breakfast: bread, tea, wheat bix
- Lunch: Rice, curry, soup
- Dinner: pap (instead of rice)

For breakfast the family usually eats bread. Cooking bread a slow process and the preparation often takes place on an outside fire.

For dinner in the household they often eat Pap. Pap, also known as mieliepap in South Africa, is a traditional porridge/polenta made from mielie-meal (ground maize) and is a staple food. The process of cooking pap takes around 2-3 hours.

She has heard about the paraffin gel, but she has never applied for it.

She has never heard about the s

Appendix 17: Semi-structured interview, Emily, Medium household

Friday 08.03.2013

Perceptions and importance:

Emily would continue to use firewood after implementation of electricity, if there are power failures, to cook *"big stuff"* and to save some money. She would prefer to cook with electricity, mainly because of health issues.

The first thing Emily would buy if they had electricity would be a TV, mostly for the kids, but also for education, news and weather forecasts. The family already saved up money to buy a TV from selling blankets, mats etc. that Emily has made.

Light is another important argument for wanting electricity, since it could serve as a possibility for income generation and make it possible to work after sunset; mostly school work.

If they got electricity Emily wants to make a hair saloon – she opens her closet and pulls out a hair dryer and says eagerly*: I am ready for electricity!* Bertram currently runs a business collecting firewood for people with his cows; this would not be affected by implementation of electricity since people would still need the wood.

In terms of security light would help a lot. She mentions that "*in the night there are many men on the streets wanting to steel cows and doing other bad things".*

Current use:

Currently Emily cooks mainly outside with firewood; here she boils water and cooks bread, porridge, meat.They eat meat once per week;this is bought in Matatiele or in the local supermarket. It costs 44 Rand for 2 kg. Sometimes they finish it and when not (the kids don't like it) the rest is stored in the gas fridge. She cook fat cakes often as well, but this is done inside using paraffin, since they need a lot of attention and she can't put on a lid. The paraffin used for cooking is mixed with some spirit which apparently should take away some of the smell and help on the eyes. She generally prefers cooking with firewood since it is faster. Never cooks with the wood inside though because of the smoke.

Other:

- When we went inside in the morning to see how Emily cook the fat cakes there was a really really strong smell of paraffin in the room and we almost got a headache from being there a couple of minutes!
- Emily has heard about the paraffin gel, but she says: *"no one receives it around this place. Other places they have it".* She did apply for a long time ago, has been waiting since 2012. *"Because of political things it is very slow. But I still have hope, you should always have hope."* She was told about the program in the community hall and she has also seen the gel.
- She has heard about eradicating the trees, but only around the houses, especially to increase security.
- They would very much like to have solar panels; they did ask for it already but got no answer! NB!

Appendix 18: Semi-structured interview, Kristine and the 15 year old granddaughter in the house

Friday 08.03.2013

Perceptions and importance:

If the household was to be provided with electricity they would save a lot of money, even though they would have to buy equipment, e.g. electricity stove. They would be able to buy such right away. The electricity would be used for the fridge, for cooking, TV. They do have a generator now though, but is has been broken for almost 9 months and the gasoline is too expensive. The first thing the grandmother would buy would be an electricity stove, whereas the girl would buy (repair) the TV.

If provided with electricity it would be additionally possible for the son to do welding and the granddaughter could open a hair saloon. She would buy a hair dryer for that. They would also very much like light in the house during the evenings for working, readingand to feel more secure. In regards to enhancing security the grandmother also mentions more secure electrical batter-proof door and windows.

Quote: *"I don't know when we get electricity. I don't think I will experience it in this lifetime so I stopped thinking about it"*

Current use:

Different sources and uses:

- Cooking: gas, paraffin for simple things (e.g. vegetables), firewood
- Light: candles, paraffin

- Heat: gas/paraffin heater
- Phone charging: solar panel
- Radio: batteries
- Iron: paraffin

Currently the girl prefers to cook with firewood, since it's quicker than with paraffin or gas. She cooks with her 14 years old sister and prefers cooking inside because it is to hot, windy, cold, raining, etc. outside. She cooks mainly porridge meat they only eat few times per month. The mama prefers cooking with the 2-plate gas stoves though; the paraffin is slow and causes some problems with the eyes. Firewood is also very quickly. She has to cook outside on the fire because of the size of the household and that there is not enough space to cook inside, but this is not the preferred way, since the weather is often too cold.

Other:

- The granddaughter has never heard about the paraffin gel, but the mama has. She knows that some people get it and has requested for it, but her household was not approved.

None of them know ab

Appendix 19: Participatory observation with wattle collection

Saturday 09.03.2013

Two observations are conducted during collection of firewood; one with Bertram who has a business collecting firewood with 6 cows and one with an old "poor" lady who collects the wood for own consumption.

Bertram collects wood with the cows every week for his own household and for two of his neighbors. The firewood collection starts at 6 in the morning with catching the cows in a paddock. It takes approximately half an hour to prepare the cows. It seems as if the old and experienced cows are in the front row and the other rows consist of apprentices. We walk with Bertram, two young boys and two boys of which one is his son to the other side of the Chalet where we find a pile of cut, dried and gathered wattle wood. If the cows are well trained a single person can do the work, but the son and the other boys are to be trained. One pile has disappeared. This happens almost every time,we are told by the translator who confirms with Bertram. It is still worth the risk of loosing some of the wood to theft to cut it in advance, since the wood is heavy when wet. The wood is attached to the cow row; the cows are very difficult to manage. The wood has been cut Wednesday where after they wait until Saturday for the collection. Every time he gathers the same amount of wood. We continue with the load further up the hill in the opposite direction than home and suddenly the follow stops and chucks the firewood at what seems to be a random house. It turns out that Bertram collects wood for around 20 households in the area and gets 100 Rand for a load. The business is especially busy during the winter. This one is sold for 50 Rand as a favor since the receiver is an old widow. People come to him and ask for a load when they are in need. After the wood is deposited Bertram heads back home to engage in other activities; he only collects one load per day.

Walking around the village we meet a young man, TshepangTaba, who collects firewood 7 times per month. It takes 5 hours per time he goes collecting and he takes 250 Rand for a load. The load is collected with 8 cows. He also uses the cows for ploughing.

The second participation we conduct with collection of firewood starts at 9 with gathering the different device for cutting down, binding up and carrying the wood. It is an old lady and she is not feeling very well that day. We walk with her, two other girls and Puleng, our interpreter, just up the road where wattle grows in the roadside. A lot of wattle has been cut down here already and the stumps have been painted with a blue painting that apparently inhibits the trees from growing. Usually she goes 2 days before collecting the wood to cut the trees down allowing them to dry up before carrying it home. For today nothing was cut down though. She didn't bring a saw, so we can only bring back small twigs and trees cut down with an axe. She ties up the twigs with a string made by grass straws and collects the small stumps, chopped with the axe in a bag and everything is carried back to the house on the head. The whole event takes a bit more than half an hour. The event today is somehow special, since she feels tired and weak and probably would not have gone if it was not because she had an arrangement with us. But it doesn't seam as if she goes regularly with women from other households, rather with her daughter and other girls related to the household.

Appendix 20: Open answers from questionnaire

Mpharane

Why are you not satisfied with your current energy situation?

She want's electricity because she would feel more safe - right now people are knocking her doors at night and she is afraid of thieves
20-3-2013 5:18 PM

Needs electricity for lightning and cooking - NOW
20-3-2013 5:11 PM

Want electricity
20-3-2013 5:00 PM

When it is cloudy
20-3-2013 4:51 PM

They accept the conditions
20-3-2013 4:44 PM

All the other energy sources are more expencive than having electricity
20-3-2013 4:35 PM

Accept the situation
20-3-2013 4:32 PM

When they use firewood inside during winter time, the smoke distroys the clothes
20-3-2013 4:19 PM

She wants electricity
20-3-2013 4:13 PM

It takes a lot of time to cook with firewood, and if it rains it is impossible to cook outside
20-3-2013 3:54 PM

Because she can not buy coal in Mpharane
20-3-2013 3:48 PM

It is boring.
20-3-2013 3:42 PM

It takes a long time to cook
20-3-2013 3:37 PM

He would like electricity to enable him to do welding as a small business
20-3-2013 3:22 PM

Very difficult to cook and the paraffin is dangerous
20-3-2013 3:17 PM

She wants electricity for everything
20-3-2013 3:09 PM

They accept the circumstances
20-3-2013 2:50 PM

They accept the circumstances
20-3-2013 2:41 PM

Because they live far from town so they cannot keep meat fresh since theydont have a fridge
20-3-2013 2:31 PM

They would like to have a fridge to keep fresh water and meat. They only eat vegetables now.
20-3-2013 2:28 PM

Paraphine is expensive
20-3-2013 2:08 PM

Animals were stolen and now it is difficult for me to collect wood and parafine is expensive
20-3-2013 2:07 PM

It is sometimes difficult to get wood specially when it is raining
20-3-2013 12:33 AM

Simply not satisfied
20-3-2013 12:06 AM

When do you expect to get electricity?

Anytime
20-3-2013 5:21 PM

May 2013
20-3-2013 5:14 PM

They have been promised electricity, but don't know when
20-3-2013 5:06 PM

August 2013
20-3-2013 4:54 PM

July 2013
20-3-2013 4:39 PM

He wants it now
20-3-2013 4:33 PM

Whenever
20-3-2013 4:21 PM

"I don't know when, they are promising all the time". Hopefully before I die"
20-3-2013 4:09 PM

Don´t know
20-3-2013 3:56 PM

2013 2014
20-3-2013 3:50 PM

"I hope next month, but things are not going the way I expect"
20-3-2013 3:45 PM

2013. The councelor said that, but they have said that before

20-3-2013 3:39 PM

They have promised us that ever since I was a child. Now he has stopped hoping for it
20-3-2013 3:26 PM

In June 2013
20-3-2013 3:19 PM
Don't know
20-3-2013 3:13 PM

2014
20-3-2013 3:03 PM

2013
20-3-2013 2:55 PM

2013 2014
20-3-2013 2:44 PM

The rumours said July 2013
20-3-2013 2:36 PM

Don´t know
20-3-2013 2:28 PM

2013 2014
20-3-2013 2:18 PM

Don´t know
20-3-2013 2:15 PM

2013
20-3-2013 2:08 PM

July 2013
20-3-2013 1:51 PM

2014
20-3-2013 12:36 AM

Don´t know. It has been promised for long time
20-3-2013 12:28 AM

End 2013
20-3-2013 12:22 AM

2013 - 2014
20-3-2013 12:08 AM

What kind of health problem do you feel that the current energy use is causing you?

Viser**18**tekstbesvarelser

Firewood and paraffin is dangerous
20-3-2013 5:22 PM

Coughing
20-3-2013 4:48 PM

Paraffin gives her headache and makes her cough
20-3-2013 4:15 PM

Paraffinmissused by children. Gas is dangerous if you don´t lock it, it can burn your house down".
20-3-2013 4:09 PM

Smoke
20-3-2013 3:50 PM

The smoke from the paraffin stove
20-3-2013 3:26 PM

The paraffin is bad for the childrens eyes
20-3-2013 3:19 PM

Smoke from paraffin makes her cough
20-3-2013 3:13 PM

Paraffin makes her feel congested. Petrol is not safe. Coughing for the smoke.

20-3-2013 3:05 PM

The paraffin gives eye problems and chest pain and breathing problems
20-3-2013 2:45 PM

Smell of paraffin gives headache and eye-problems. The gas harm the children
20-3-2013 2:36 PM

Paraffin affects chest
20-3-2013 2:15 PM

Smoke causes chest pain and coughing
20-3-2013 2:08 PM

Paraffin smoke causes chest problems
20-3-2013 1:51 PM

Paraffin is dangerous if you get a drop on your skin. Smoke from the firewood is a problem
20-3-2013 12:37 AM

Paraffin causes eye problems.
20-3-2013 12:28 AM

Asthma
20-3-2013 12:22 AM

Vomitting, Eye problems
20-3-2013 12:08 AM

Queen's Mercy:

What is the best thing about having electricity?

Viser**12**tekstbesvarelser

Cooking, TV, fridge
20-28-åååå 11:mm

Cooking is faster,she saves a bit of money now compared to before (before she used gas for cooking and for the fridge). Life is easier with electricity
20-18-åååå 11:mm

Having light during night time - it allows her to work after sun set, and to assisst the children with homework during the evening.
20-14-åååå 11:mm

Lighting, cooking, TV, fridge, iron
20-12-åååå 11:mm

She doesn't need wood anymore. It is faster and there is no smoke.
20-09-åååå 11:mm

Light
20-08-åååå 11:mm

It is faster for both light and cooking, also it is better for the health, as cooking with paraffin caused eye problems. it is cheaper to use electricity, mostly due to the cost of paraffin.
20-06-åååå 11:mm

Lighting
20-03-åååå 11:mm

Cooking is much faster now and it is much faster to get the children ready fr school - especially ironing the school uniforms in the morning
20-02-åååå 11:mm

Cooking and light
20-49-åååå 10:mm

to have a fridge for the foodand to able to watch TV .- especially "Generation"
20-48-åååå 10:mm

Light, TV, Radio and Fridge
20-37-åååå 10:mm

Additional comments and quotes:

Viser**7**tekstbesvarelser

This household had a lot of appliances for electricity - micro wave, blender, washing maschine etc. She still uses wood to cook porridge. She collects the wood her self She uses a generator when during power cuts.

20-18-åååå 11:mm

She only uses electricity for cooking sometimes (when it is cold or raining). She prefers to cook outside on firewood, as it tastes better and because thats the way she used to do it. She never uses paraffin, because it causes her eye problems

20-14-åååå 11:mm

Everthing is good with electricity

20-12-åååå 11:mm

When she needs money she still uses wood outside

20-09-åååå 11:mm

She paid 2000 rand for the installation of electricity in her house

20-06-åååå 11:mm

She still cooks outside due to tradition. she especially makes bread one firewood outside, becau

Appendix 21: Open interview with one employee of Mpharane Supermarket (nephew of the owner)

Saturday 02.03.2013

Intro:

The young Indian guy we were talking to is working at the Mpharane supermarket, which is the business of his uncle. He was working at the moment of the conversation what made more complicated to get through the different topics we wanted to talk about and shorted the talk.

Perceptions and importance:

He believes that electricity should be installed in Mpharane as it seems quite unfair to have it just on the other side of the bridge but not there. He believes it is going to be bring more security to the area (he complaint about thefts, especially to the supermarket). Regarding his uncle's business, he said his uncle is planning to invest on bigger fridges that run on electricity instead of the ones they are using now running on gas. He is convinced that it is going to be cheaper for them those new fridges, and he might offer new prices and services to the community with that new equipment.

So far, Mpharane's Supermarket has only two medium fridges running on gas available.

Appendix 21: Open interview with one employee of Mpharane Supermarket (nephew of the owner)

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Intro:

The young Indian guy we were talking to is working at the Mpharane supermarket, which is the business of his uncle. He was working at the moment of the conversation what made more complicated to get through the different topics we wanted to talk about and shorted the talk.

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So far, Mpharane's Supermarket has only two medium fridges running on gas available.

Appendix 22: Semi structured household interview, Maria (poor household)

Friday 08.03.2013

Current use & implications:

Maria prefers cooking with firewood, since it is quicker (the paraffin stove is very slow). She prefers cooking outside even though it rains; when raining she would just put something to protect from the rain.

She cooks outside for "heavy"/big things like porridge and inside for small things like potatoes and veggies. For breakfast they eat bread and tea. Meat is only if they have a bit of money.

Other:

She has heard about the paraffin gel, but she has never applied for it.

Solar: knows about it but didn't ask. She is not interested since people steal them!

Appendix 23: Open answers from questionnaire survey, Queen's Mercy

8. What is the bestthingabouthavingelectricity?

Showing**12**textresponses

Cooking, TV, fridge
3/20/2013 11:28 AM

Cooking is faster, she saves a bit of moneynowcompared to before (beforesheused gas for cooking and for the fridge). Life is easier with electricity
3/20/2013 11:18 AM

Having light duringnight time - it allows her to workaftersunset,and to assisst the children with homeworkduring the evening.
3/20/2013 11:14 AM

Lighting, cooking, TV, fridge, iron
3/20/2013 11:12 AM

Shedoesn'tneedwoodanymore. It is faster and there is nosmoke.
3/20/2013 11:09 AM

Light
3/20/2013 11:08 AM

It is faster for both light and cooking. also it is better for the health, as cooking with paraffin causedeye problems.it is cheaper to useelectricity, mostly due to the cost of paraffin.
3/20/2013 11:06 AM

Lighting
3/20/2013 11:03 AM

Cooking is much faster now and it is much faster to get the childrenreadyfrschool - especiallyironing the school uniforms in the morning
3/20/2013 11:02 AM

Cooking and light

3/20/2013 10:49 AM

To have a fridge for the food and to able to watchTV .- especially "Generation"
3/20/2013 10:48 AM

Light, TV, Radio and Fridge
3/20/2013 10:37 AM

9. Additionalcomments or quotes

Showing**7**textresponses

This household had a lot of appliances for electricity - microwave, blender, washingmaschine etc. She still useswood to cookporridge. Shecollects the wood her self Sheuses a generator whenduring power cuts.
3/20/2013 11:18 AM

Sheonlyuseselectricity for cookingsometimes (when it is cold or raining). Sheprefers to cookoutside on firewood, as it tastes better and becausethats the waysheused to do it She never uses paraffin, because it causes her eye problems
3/20/2013 11:14 AM

Everthing is good with electricity
3/20/2013 11:12 AM

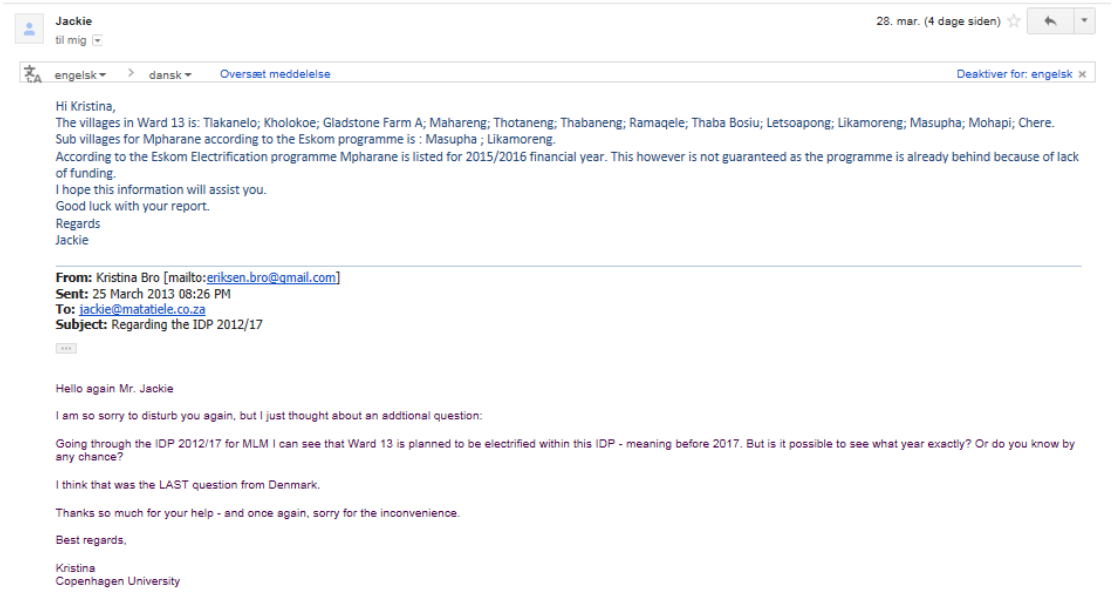
Whensheneedsmoneyshe still useswoodoutside
3/20/2013 11:09 AM

Shepaid 2000 rand for the installation of electricity in her house
3/20/2013 11:06 AM

She still cooksoutside due to tradition. sheespeciallymakesbreadonefirewoodoutside, because it takes a long time to cook and thatwouldbetooexpensive in electricity
3/20/2013 11:02 AM

In the householdtheymainlyuse paraffin duringwinther timer. alsocandles, generator and gas is mainlyusedduring power cuts
3/20/2013 10:48 AM

Appendix 24: Mail correspondance with Mr. Jackie Augustin



Jackie 28. mar. (4 dage siden)

til mig

engelsk › dansk Oversæt meddelelse Deaktiver for: engelsk ×

Hi Kristina,
The villages in Ward 13 is: Tlakanelo; Kholokoe; Gladstone Farm A; Mahareng; Thotaneng; Thabaneng; Ramaqele; Thaba Bosiu; Letsoapong; Likamoreng; Masupha; Mohapi; Chere.
Sub villages for Mpharane according to the Eskom programme is : Masupha ; Likamoreng.
According to the Eskom Electrification programme Mpharane is listed for 2015/2016 financial year. This however is not guaranteed as the programme is already behind because of lack of funding.
I hope this information will assist you.
Good luck with your report.
Regards
Jackie

From: Kristina Bro [mailto:eriksen.bro@gmail.com]
Sent: 25 March 2013 08:26 PM
To: jackie@matatiele.co.za
Subject: Regarding the IDP 2012/17

Hello again Mr. Jackie

I am so sorry to disturb you again, but I just thought about an addtional question:

Going through the IDP 2012/17 for MLM I can see that Ward 13 is planned to be electrified within this IDP - meaning before 2017. But is it possible to see what year exactly? Or do you know by any chance?

I think that was the LAST question from Denmark.

Thanks so much for your help - and once again, sorry for the inconvenience.

Best regards,

Kristina
Copenhagen University

Appendix 25: Household assesment

	FENCE	ROOF	HOUSE	ANIMALS	FRIDGE	GAS	SOLAR	GENERATOR	TV	CELL	H. GARDEN	TRACTOR	CAR	SAVINGS	CLASIFICATION
1	M	M	M	M	M/R	M	P	P/M	P	M/R	M/R	-	-	-	MEDIUM
2	M	M	M	M	M	M	M/R	R	M/R	M/R	P	-	-	R	MEDIUM
3	M	M	M	P	P	P	P	P/M	P	P	M/R	M/P	M/P	-	POOR
4	M	M	P	P	P	P	M/R	P/M	P	M	M	-	-	-	POOR
5	R	R	R	M/R	M/R	M	M/R	R	M/R	M	P	M	R	-	RICH
6	M	P	M	P/M	P	P	P	P/M	P	M	P	-	-	-	POOR
7	M	M	M	P	P	P	P	P/M	P	P	P	-	-	-	POOR
8	M	M	M	P	P	P	P	P/M	P	M	P	-	-	-	POOR
9	M	M	M	P	P	M	P	P/M	P	M	P	-	-	-	MEDIUM
10	M	M	M	P	P	M	P	R	M/R	M/R	M/R	-	-	-	MEDIUM
11	M	M	M	M	P	P	P	P/M	P	M/R	P	-	-	-	POOR
12	M	M	M	P/M	P	P	M/R	P/M	P	M/R	M/R	-	-	-	MEDIUM
13	R	R	M/R	P	P	M	P	R	P	M/R	M/R	-	-	R	RICH
14	R	M	M	P	P	M	P	M/P	P	M	M	-	-	-	MEDIUM
15	M	M	M	P	P	P	M/R	M/P	P	M	P	-	-	R	MEDIUM
16	M	M	M	M	P	P	M/R	M/P	P	M	M	-	-	-	MEDIUM
17	R	M	R	P	M/R	M	M/R	M/P	M/P	M/R	P	-	R	R	RICH

	FENCE	ROOF	HOUSE	ANIMALS	FRIDGE	GAS	SOLAR	GENERATOR	TV	CELL	H. GARDEN	TRACTOR	CAR	SAVINGS	CLASIFICATION
A	M	M	M	P	M/R	M	P	P/M	M/R	M	M/R	-	-	-	MEDIUM
B	M	M	M	P	P	P	P	P/M	P	M	P	-	-	-	POOR
C	M	M	M	M	P	P	P	P/M	P	P	M	-	-	-	POOR
D	M	M	M	M	M/R	M/R	P	P/M	P	M	M	-	-	-	MEDIUM
E	R	R	R	P	M/R	M/R	P	R	M/R	M/R	M	-	-	-	RICH
F	R	R	R	P	M/R	M/R	M/R	M/P	P	M/R	M/R	-	-	-	RICH
G	M	M	P	P	P	P	P	M/P	P	M	P	-	-	-	POOR
H	M	M	M	P	M/R	M/R	M/R	M/P	P	M	M/R	-	-	R	MEDIUM
I	R	R	R	R	R	M/R	M/R	R	M/R	M/R	M/R	-	R	R	RICH
J	M	M	M	P	P	P	P	P	P	M	M	-	-	-	POOR
K	M	P	M	M	P	P	M/R	M/P	P	M	P	-	-	-	POOR
L	M	M	M	M	P	P	P	M/P	P	P	M/R	-	-	-	POOR
M	M	M	M	P	M/R	M	P	M/P	P	M/R	P	-	-	-	MEDIUM

Appendix 26: Questionnaire, Queens Mercy

Name of respondent: _____

Household size: _____

What do you use for the following household activities;

Activity	**Energy source**
Cooking	
Lightning	
Fridge	
Heating	
Radio	
TV	
Cell phone recharging	
Ironing	
Fan/ventilator	
Others, please specify	

How much money do you spend monthly on electricity? _____

How much money do you spend monthly on the following energy sources;

Energy source	**Monthly cost**
Gas	
Paraffin	
Candles	
Batteries	

Paraffin gel	
Fire wood	
Fuel for generator	
Other, please specify	

What is the best thing about having electricity?

_____

_____

Household assessment

- Do you have any kind of savings?
- Do you have any animals?
- Do you have a home garden where you grow vegetables to consumer or sell?
- Do you have a generator?

Do you have a solar panel

Appendix 27: Household questionnaire, Mpharane

Questionnaire identification number_____

1.DEMOGRAPHIC

RESPONDENT IDENTIFICATION

1.1) **Gender**
1.1)1. Male
1.1)2. Female

1.2) **Age**:

1.3) **Household size____**

1.4) **HOUSEHOLD INFORMATION**

Name	**Relation to HH**	**Gender**	**Age**		**Marital status**	**Educational level**
			Year	**Month**		
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

2. CURRENT USAGE OF ENERGY SOURCES

2.1) Do you have a solar panel in your household?
2.1)1. Yes
2.1)2. No
2.1)3. Don't know

2.2) Do you have a generator in your household?

2.2)1. Yes
2.2)2. No
2.2)3. Don't know

2.3) What energy sources do you use for the following household activites;

Activity	**Source of energy**
Cooking	
Lighting	
Fridge	
Heating	
Ventilator/fan	
Radio	
Television	
Iron	
Cell phone	
Other (please specify):	

2.4) Are you satisfied with the energy sources that you use?

2.4)1. Yes (GO TO QUESTION 3.1)
2.4)2. No
2.4)3. Don't know

2.5) What are the reasons that you are unsatisfied with the current energy sources?

3. NATURAL CAPITAL

3.1) Do you use firewood?

3.1)1. Yes
3.1)2. No (GO TO QUESTION 4.1)

3.2) How do you get the wood?

3.2)1. Buying (GO TO QUESTION 3.4)
3.2)2. Collecting (GO TO QUESTION 3.8)
3.2)3. Both (GO TO QUESTION 3.4)
3.2)4. Don't know (GO TO QUESTION 3.3)

3.3) Do you buy a tractor load?

3.3)1. Yes
3.3)2. No
3.3)3. Don't know

3.4) Do you buy a cow bundle?

3.4)1. Yes
3.4)2. No
3.4)3. Don't know

3.5) Do you buy any other unit than the mentioned?

3.5)1. No (GO TO QUESTION 3.6)

3.5)2. Yes

3.5)2.1. If yes, please specify

3.6) How many times per week do you buy wood?

3.7) Who in the household is collecting the wood?

3.7)1. Men

3.7)2. Women

3.7)3. Boys

3.7)4. Girls

3.8) How many times per week do you or another household member go to collect wood?

3.9) Every time you go, how many hours do you spend on collecting wood?

3.10) Is there a difference in the use of wood between summer and winter?

3.10)1. No (GO TO QUESTION 4.1)

3.10)2. Yes

3.10)2.1. In the summer we use more than in the winter

3.10)2.2. in the winter we use more than in the summer

4. FINANCIAL CAPITAL

4.1) How much money do you spend on the following energy sources per month?

Source of energy	Amount spend per month
Gas	
Paraffin	
Candles	
Batteries	
Paraffin gel	
Wood	
Fuel for generator	
Other. Please specify	

4.2) How much did you pay for your solar panel?

4.3) How much did you pay for your generator?

4.4) What kind of income sources do you have in your household?

4.5) Out of these, what is your household's main income?

4.6) Do you receive pension?

4.6)1. Yes

4.6)2. No

4.6)3. Don't know

4.7) Do you receive remittances?

4.7)1. Yes
4.7)2. No
4.7)3. Don't know

4.8) Approximately how much was the household's income last month?

4.9) Does your household have any kind of savings?

4.9)1. Yes
4.9)2. No
4.9)3. Don't know

4.10) What arethe three things your household spend the most of money on per month?

4.10)1. School
4.10)2. Health
4.10)3. Clothes
4.10)4. Energy sources
4.10)5. Alcohol
4.10)6. Cigarettes
4.10)7. Food
4.10)8. Other, please specify
4.10)9. Don't know

5. STRUCTURE & PROCESSES

5.1) Are you expecting to be provided with electricity in your village?

5.1)1. No (GO TO QUESTION 6.1)
5.1)2. Yes

5.2) If yes, when do you expect electricity to be provided in the village?

6. HEALTH

6.1) **Do you feel that the energy sources that you are using are causing you any health problems?**

6.1)1. No (Skip last question)
6.1)2. Yes

6.2) What kind of health problems is the energy use causing?

7. HOUSEHOLD ASSESSMENT

7.1) Do you have any animals in your household?

7.1)1. No (GO TO QUESTION X)
7.1)2. Yes
7.1)2.1. If yes, please specify what kind of animals

7.2) Do you have a home garden in your household?

7.2)1. No (GO TO QUESTION X)
7.2)2. Yes

7.3) Do any in your household own a car?

7.3)1. Yes
7.3)2. No
7.3)3. Don't know

7.4) Do any in your household own a tractor?

7.4)1. Yes

7.4)2. No

7.4)3. Don't know

Appendix 28: Interview Guide. School

1- How do you cover your energy needs?
2- Do you have any issues covering your current energy use?
3- Are you expecting to get grid electricity?
4- How do you think the school will be influenced by the implementation of grid-electricity from the quality of teaching ?

Appendix 29: Interview Guide. Health Clinic

1- How do you cover your energy needs?
2- Do you have any issues covering your current energy use?
3- Are you expecting to get grid electricity?
4- What influences will it have on your work on the clinic in general?
5- What are the main health problems that you meet? Differences on male and female.
6- What causes these health problems?
7- Do you knwo of any health problems related to the current use of the different energy sources?
8- If yes, do you know if the population has been informed about this? (Do you inform your patients about this relation?)

Appendix 30: Interview Guide. Semi-estructured interview with Households

1- What would you use the electricity for?
2- What would be the first thing you would buy if you get the electricity?
3- Would you be able to afford .... (TV) and if so, how long would you have to save money?
4- What do you prefer cooking with? Why?
5- Where do you prefer to cook, inside or outside? Why?
6- Why do you use parafin for something and firewood for other things?
7- What do you normally eat?
8- Do you know about the gerl? Did you request for it?
9- Do you want a solar solar panel? Did you request for it? Did you hear about the program that has been implemented a couple of years ago?