

A post-electrification study of the Mafefe electrification project

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List of abbreviations and nomenclature

DME	Department of Minerals and Energy
EA	Electricity Agency
EC	Electricity Committee
IDT	Independent Development Trust
IP	Illuminating Paraffin
LPG	Liquefied Petroleum Gas
MDF	Mafeke Development Forum
NNSDP	National Nutritional and Social Development Programme
NORAD	Norwegian Agency for International Development
SACC	South African Council of Churches
STD's	Sexually transmitted diseases
TB	Tuberculosis
TLC	Transitional Rural Council
TRI	Technology Research and Investigations
Unisa	University of South Africa
Bakkie	Small, flat-bed pick-up truck
Bilharzia	Water-borne disease
Biltong	Strips of spiced meat which is dried
Induna	Headmen under the chief
Lapa	A yard surrounding an outside fireplace
Lobola	Bride price
Marogo	Wild spinach
Rondavel	Thatched hut
Trek-pas	Letter of permission for moving issued by the Chief

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1. Introduction

The EDRC (Energy and Development Research Centre) is responsible for a project entitled "The role of electricity in the integrated provision of energy in rural areas", which is jointly funded by the Norwegian Agency for International Development Co-operation (NORAD), The Department of Mineral and Energy (DME) and Eskom's Technology Research and Investigations (TRI). The project aims to assist in the development of appropriate rural electrification policies for South Africa as well as providing practical assistance to rural electrification implementing and funding agencies.

Key areas of research that are being addressed in the course of the project include:

- electricity use by rural households in the context of multiple fuel use to meet particular service needs, and the factors impacting on the use of electricity;
- the impact of electrification on the livelihoods of rural people;
- the impact of electrification on economic activity in rural areas;
- the impact of electrification on public facilities and services in rural areas;
- the viability of load-limited electricity supply options and systems of local responsibility for revenue management in rural communities;
- the nature of the planning process employed in rural electrification, and the manner in which local involvement in these processes is structured;
- the nature of the planning process employed in the electrification of public facilities in rural areas, and the degree of co-ordination with other development sectors in these processes; and
- priorities with respect to the electrification of public facilities in rural areas.

The first project cycle, completed in May 1996, undertook six case studies in order to generate empirical information on key research questions addressed by the project. The following case studies were undertaken:

- post-electrification study of Loskop, KwaZulu/Natal;
- pre-electrification study of Santombe, KwaZulu/Natal;
- pre-electrification study of Mafefe, Northern Province;
- pre-electrification study of Tambo, Eastern Cape;
- post-electrification study of farmworker electrification in the Free State;
- pre-electrification study of schools and clinics, Eastern Cape.

The second project cycle (May 1996 to April 1997) includes a further five case studies.

1.1 Background

The Mafefe electrification project case study forms part of the EDRC project "The role of electricity in the integrated provision of energy to rural areas. Pre-electrification research was conducted in Mafefe in October 1995 and a report entitled "Pre-electrification research in Mafefe: energy use, livelihoods, power relations and the electrification process" (Thom 1996) was published, summarising key research findings.

Post-electrification research was conducted during October and November 1996 in four villages, namely Ngoaname, Betle, Magapatoma and Kapa in Mafefe. The report below will present key research findings on the main research activities undertaken for the post-electrification study in Mafefe

1.2 Aims and objectives

The key research questions as-identified by the terms of reference focused on the following issues:

- the electrification process followed in Mafefe;
- the labour-based construction process used in Mafefe;
- energy use and the supply and tariff options provided in Mafefe;
- issues regarding the Electricity Agency in Mafefe;

- livelihoods and agricultural activity in Mafefe.

The aims and objectives for the post-electrification study in Mafefe can be summarised as follows:

1. To investigate the electrification planning and implementation process from the perspective of community organisations and structures as well as individual households.
2. To assess the planning and implementation process followed by Eskom and the contractors, Van Wyk & Louw regarding the labour-based construction method used in Mafefe.
3. To investigate household energy use, with specific emphasis on the use of electricity. Since the majority of the households utilise the 2.5A electricity supply, specific attention will be paid to issues surrounding limited supply such as the case in Mafefe.
4. To investigate household livelihood strategies through an analysis of the role of agriculture and other income generating or subsistence activities.
5. To investigate the social relations of power within the community as well as in individual households and to determine how social power relations impact on equitable access to resources in Mafefe.
6. To investigate the role, function and structure of the Electricity Agency, community perceptions regarding the Electricity Agency as well as the financial and organisational viability of the Electricity Agency.

1.3 Approaches and Methodologies

EDRC contracted The Land Research Unit to complete the post-electrification study in Mafefe. The fieldwork was conducted by four members of the LRU, namely Chris Mulaudzi, Desiree Sehlapelo, Magdelene Manzini and Chris Wood. The final report was compiled by Marlett Wentzel (MW Energy and Development Services), assisted by the LRU.

Four target groups were identified on which the research activities were concentrated. These were:

- households
- businesses
- community and institutional structures
- The electricity utility (Eskom) and the project consultant (Van Wyk & Louw).

The study was conducted with newly electrified households in the Mafefe community in the villages of Ngoaname, Betle, Magapotoma and Kapa. The post electrification research took place approximately eight months after electrification of the villages occurred. Villages were not connected to the grid simultaneously and villages and sections of villages were switched on as soon as the work had been finished. In order to protect identities and keep respondents anonymous, names of respondents have been changed. In some cases where interviews were conducted with business owners, it is difficult to distinguish between businesses and households since businesses (shops) are conducted from respondents' homes. Interviews were also conducted with a representative of Eskom and Van Wyk & Louw (now Africon) as well as relevant community organisations.

Tensions within the community between traditional structures and their allies, represented by the Kgoshi and the recently-elected democratic structures represented by the TLC, made working in the community a sensitive process. The difficulties presented by the situation in Mafefe were manifest from the beginning of the project and had their effect on all aspects of the research.

Normally, the selection of respondents would have been based on some form of random or stratified random selection. However, at the very outset, when LRU representatives went to meet Kgoshi Thobejane, it was made quite plain that this would not be acceptable. They were informed by the Kgoshi that the respondent households would be given to them by the staff of the Electricity Agency. In spite of objections to this, the

Kgoshi was insistent that this should be the procedure. It was apparent that it was of no consequence to the Kgoshi whether the project went ahead or not and in fact the opposite was probably true; that he would have preferred not to have the project at all. The LRU personnel took an immediate decision to go along with this and to work within and to adapt the research to this constraint rather than jeopardise the entire project.

Having agreed to this, The LRU indicated that they needed six respondents and the Kgoshi agreed that the team could approach the Agency for six names. Immediately on leaving the Kgoshi the researchers went to the Agency and asked for six names. At first they were reluctant to co-operate, but on being informed that the Kgoshi had given his permission they went through their accounts records and chose names in what appeared to be a random manner. Having made the decision to work with those households identified by the Agency, it was decided to "balance" this with households identified by the local council representatives. Accordingly they were approached with the same request for six households. As with the Agency representative, the team made it clear that they did not only want to work with wealthy and articulate respondents. In fact, one household was rejected because it appeared too wealthy and not representative of the average household in the village in terms of size, structure and visible displays of wealth. The research team makes no pretence that this was in any way ideal or fully objective, but only making the best of a difficult situation in order to carry out research at all. In spite of these difficulties and the nature of the selection process, LRU is of the opinion that the households were not in fact unrepresentative of the households in the four communities identified by EDRC as the location of the research. It appeared that both sides were more concerned that the team should interview households who supported their "cause" in general political terms than with what they might say about the electrification process. One respondent, a relation of the Kgoshi and a supporter was nevertheless one of the most outspoken about the proposed tariff increase. The household was one of the instigators of the proposed boycott of the increase.

The selection of households was therefore not random. Those identified by the Agency tended to be slightly wealthier and most lived in block built square houses with zinc roofs. An attempt to balance this was made in the selection of the additional six households. However, one of the poorest households was also identified by the Agency. Two of the respondents were follow-ups on research conducted during the pre-electrification study. These were included so as to see what changes electricity had brought to their lives. One of these had started a small business selling food and snacks to the local school children as well as selling from her house. Two of those identified by the Agency also ran shops, one from their house and one from a separate shop next to their house but on the same stand. Both of these were interviewed primarily as businesses and not as households although there was considerable overlap because they used stock from their shops for home consumption.

It had been originally intended that formal participatory rural appraisal (PRA) tools would be used with all members of the household in the 14 households (including two shops) in the study. This was based on the supposition that the households would be extended family households. However, when the researchers visited Mafefe they found that all the households visited conformed more closely to the nuclear family model. A breakdown of the households interviewed are as follows:

Households included in the study consisted of six "nuclear families" (husband and wife) but of these, three husbands were working away from Mafefe and in one of these three, the wife resides with the mother-in-law, while the other two live with their children. In one of the remaining three, the wife was away studying and she only returned on weekends, leaving the husband at home with the daughter. In another household, the wife would be away for a few months helping her daughter who has just given birth; and in the third, the husband was now usually at home because he was unemployed, but he used to live away from home. Three of the households consisted of an adult daughter staying with her mother and her (the adult daughter's) children. Two households consisted of grandmothers staying with their grandchildren; in one household the daughter had remarried after the death of her husband and is now living outside the area; in the other case the daughter lived with her boyfriend in another village and they could not afford to look after the children, so the grandmother raises them on her

pension. One household consists of an adult women looking after her child and her sister's children while the sister is away working in Johannesburg. The household structure was striking because it was unexpected. Enquiries at other households revealed that it was common in the community - adult children left the home and established their own home, sometimes nearby, but always separately. Because of the situation it was decided to abandon the PRA tools appropriate for group work and to rely instead on in-depth interviews with the respondents.

Research activities can be summarised as follows:

Table 1: Main research activities

<i>Date</i>	<i>Activity</i>		<i>Participants</i>
21-25 Oct 1996	Pre-visit to Mafefe	Inform community, identify households, arrange meetings, interviews, accommodation etc.	LRU
26-27 Oct	Workshop held in Pietersburg	Review of methodologies and planning of research	LRU Bronwyn James (EDRC)
27 Oct - 3 Nov	First field visit	Interviews with households, community structures, institutions and businesses	LRU
24 Nov - 1 Dec	Second Field Visit	Follow-up interviews as well as interviews that could not be conducted during the first field visit	LRU MWEDS
	Interview with Eskom		LRU
	Interview with Africon (Van Wyk & Louw)		LRU

A total of 14 households were visited including two households which had been visited during the pre-electrification study. Three businesses were visited; two operated from the residence while the third operated from a separate shop next to the house.

The following community organisations, committees and structures were visited in the course of the fieldwork (see section 2.1 for a more detailed discussion on organisations and institutions in Mafefe):

1. Kgoshi Thobejane
2. Indunas
3. Mafefe Development Council
4. Electricity Agency
5. Community Centre
6. Transitional Rural Council
7. Kgaleme Secondary School
8. Workers' Committee for the electrification project

Other organisations interviewed included Eskom and Africon (formerly Van Wyk & Louw).

The research in Mafefe was carried out under difficult conditions, impacting on the quality of the report and the ability of the research team to fulfil the requirements of the terms of reference. Firstly, the Kgoshi refused to allow the team to work in Mafefe if they had anything to do with the EDRC or the University of Cape Town. This refusal resulted from his objections to the findings and the criticism of the electrification process which had been expressed in a letter to Eskom and in the report on the pre-electrification research conducted in Mafefe by Thom (1996). The Kgoshi was openly hostile to the researcher, whom he saw as representing EDRC and to UCT in general as the body responsible for EDRC. The researchers had to make it very clear to the Kgoshi that although they were contracted by EDRC, they were not part of EDRC or UCT and that they were an autonomous organisation. Although it was accepted by the Kgoshi, he remained suspicious. This subsequently led to a more detailed explanation of the

researcher's credentials and an explanation of the nature of a contractor and the contracting agency. Thereafter, in all the dealings with the Kgoshi or members of the Tribal Authority, it was necessary to stress the researcher's independence and that no links existed between the researchers and EDRC except those of a purely contractual nature.

The initial suspicion of the Kgoshi, however, caused other traditional community structures to mistrust the research team and incidents occurred where they refused to organise meetings and participate in the research. Since only three members of the MDC were resident in Mafefe, another meeting had to be organised when more members and the Kgoshi could attend, it was explained.

The community dynamics in Mafefe also made it very difficult to gain information. The TA, Kgoshi and MDC were opposed to the TLC and Community Centre. The clashes between traditional structures and the newly-elected structures illustrated in a microcosm what is also taking place in other rural areas of South Africa. The traditional leadership feels threatened by the new structures and convinced that the new structures are encroaching on their area of authority. The Kgoshi and the traditional structures are very closely linked to the electrification project. Community members clearly indicated this by comments such as "we got the electricity because the Kgoshi wanted it" and "to criticise the electricity is to criticise the Kgoshi". Residents are acutely aware of this fact and it must be assumed that, despite the assurance that all names would be changed so that households could not be identified, information was probably withheld or criticism softened. The reasons for people being scared of criticising the Kgoshi could be their fear that criticism could lead to conflicts which are sometimes resolved violently or not resolved at all. Households were, however, willing to speak to researchers and participate in the research. One respondent insisted that only good things were written about Mafefe and that the research team would have to come back to account for their work if they wrote anything negative about Mafefe. Meetings were cancelled and structures refused to speak to the research team if the Kgoshi was not present.

The interview conducted with Mr Baloyi of Eskom, although arranged three weeks in advance had to be cut short due to another unexpected meeting. The depth of information was therefore, not very satisfactory.

1.4 Report outline

The report is organised in seven main sections. The first section provides background to the project, and aims and objectives as well as methodologies and approaches used in the study. The second section focuses on key organisations and institutions in Mafefe with a discussion of the role, functions and efficiency of the Electricity Agency in Mafefe. The third section investigates the electrification process in Mafefe. It provides an overview of the history of the electrification process, the main role-players involved as well as community perceptions regarding the process and the role-players. The fourth section deals with the labour-based construction process as utilised by Eskom through the contractors Africon (Van Wyk & Louw). Issues such as the process which was followed, community involvement and participation, capacity building and skills transfer as well as the impact on social relations of power and equity are addressed. The fifth section highlights key issues emerging around household energy and electricity use. It also examines livelihoods in Mafefe and how households' livelihood strategies are influencing their energy and electricity use. The sixth section focuses on energy use patterns, energy expenditure and specifically the use, impact and limitation of electricity in the form of the 2.5A supply. Lastly, key issues are highlighted in terms of their possible impact on future rural electrification policy formulation. Specific conclusions and recommendations are presented as section seven of the report.

2. Contextualisation

2.1 Background on Mafefe

The following section is a brief description of the Mafefe area, in order to orientate and provide a framework for contextualisation of energy issues. The information presented is mainly summarised from the report "Pre-electrification research in Mafefe: energy use, livelihoods, power relations and the electrification process" (Thom, 1996) as well as on an interview conducted with Kgoshi SG Thobejane during the post-electrification research in Mafefe. Thom (1996) provides a detailed description of the physical environment, demographic information, organisations and institutions, provision of public services, the local economy and energy use in the Mafefe area. To avoid duplication, only a brief description of the area, its history and key features will be provided.

Mafefe is an area of approximately 250 km² in the former Lebowa, currently the Northern Province. It is situated roughly 75 km from Pietersburg in a south-easterly direction on the Burgersfort road (R37) in a triangle between the Strydpoortberg, the north-eastern Drakensberg and the Olifants river.

The mean annual precipitation is estimated at between 780 mm and 1000 mm. Most of the area consists of uninhabitable mountainous slopes interspersed with fertile, sloping valleys at points along the Mohlaptse and Olifants rivers. Villages are situated mainly along the foot of the mountains above the arable land. Abrams *et al* (1989) as quoted in Thom (1996) estimate the number of villages in Mafefe as ranging between 27 and 33. The research team identified 34 villages, namely:

- | | | |
|--------------------------------|-------------------------|-----------------|
| 1. Motsane | 2. Maredi | 3. Betle |
| 4. Mokgotho | 5. Rakgoale | 6. Mashushu |
| 7. Ga Mahlakwane | 8. Mphaphe | 9. Malakabareng |
| 10. Tading | 11. Matsoang | 12. Staseng |
| 13. Mokometsane | 14. Malemeko | 15. Ga Madika |
| 16. Magope | 17. Ditabogong | 18. Mokgalake |
| 19. Ngoaname | 20. Gemina | 21. Kapa |
| 22. Cork | 23. Mantlhane | 24. Mataung |
| 25. Sekgwarapeng | 26. Ga Mampa (Fertilis) | 27. Potleneng |
| 28. Magapatoma | 29. Ga Moila | 30. Mahlajane |
| 31. Thabamoopo | 32. Ramonware | 33. Shadueng |
| 34. Marulatshiping (New Stand) | | |

The area of Mafefe used to consist of a larger land area than presently occupied. Land was lost under the policies of the previous government. Inhabitants were forced to move from the area known as The Downs in the 1970s, and they also lost the farms known as Stellenbosch and Fraserburg. However, Fraserburg was returned to the community in 1995 and they are presently also trying to get the Downs area restored to them according to the Kgoshi. Two households included in the study (households 2 and 7) were affected by forced removals. These households were part of the poorer segment of the households in the study and household 7 had no regular income at all. As a result of the forced removals, victims settling in Mafefe are regarded as foreigners and their access to land is restricted (see also section 5.3 where the concept and impact on foreigners are discussed in more detail). Discrimination against people on the grounds of their foreignness impacts on their livelihood strategies by limiting their access to natural resources. This in turn impacts on the household's ability to realise their basic needs in general and fulfil their energy needs specifically.

The Downs area was sold and the people living there were evicted. Pine trees and exotic fruit trees were planted in the area and recently a nature reserve was established. The area is presently controlled by the National Parks Board and people are not allowed into

the area for collecting firewood, for example. There has been conflict between the Parks Board and the local communities and people have been fined for trespassing (Thobejane, 1996).

Asbestos mining took place in the area from 1929 to the late 1970s. Some of the employees were local and others came from as far away as Mozambique, Zimbabwe and Swaziland. An asbestos committee was established under Dr. Phillips in 1985 and household surveys were carried out to discover the extent of asbestosis. Four cases of asbestos-mining related illnesses were reported from households interviewed for the study. It seems that asbestosis and related illnesses are not only limited to ex-mineworkers. Out of a sample of 14 households the cases reported seemed very high and indicative of a large extent of asbestosis and related illnesses in the area. Victims may apply for a lump sum payment from a fund set up to deal with the claims. The victim can then register as unable to work and receives a monthly disability pension. Together with regular pensions and remittances from migrant workers, disability pensions constitutes a large form of income to households in Mafefe (Thom, 1996). Out of the four households in the study affected by asbestos-related illnesses, only one household (household 6) received any form of compensation. Although mining related illnesses clearly affect households they are not clearly benefiting from it in terms of receiving disability pensions or compensation. Income derived from this source can therefore not be concluded to have an important impact on households' positions or electricity consumption. Other sources of income for households include subsistence agriculture, selling of fuelwood, making clay bricks and building houses and lapas.

According to Abrams *et al* (1989) as quoted in Thom (1996) the total population of Mafefe in 1989 was found to be 11 202 (including migrant workers) with 47% of residents being male and 53% female. It was further reported that 17% of the population was away from Mafefe as job seekers, students or migrant workers. According to Kgoshi SG Thobejane, 18 000 people are living in the 34 villages of Mafefe. In the past, each village had a headman or woman but some of these positions have been lost over time so that now there are only 16 headmen and women with 34 villages under them. Of the 16 positions, two were occupied by women. The one woman died shortly before the second field visit occurred, while the other woman is the headwoman of Gamakgotho. All the positions are hereditary - normally the child of the first wife of the Kgoshi will be the future chief, and the Kgoshi claimed that it made no difference to a village whether there was a headman or a headwoman.

According to the Kgoshi, if someone from outside Mafefe wishes to settle in the area they must apply to the Tribal Authority for "citizenship" of Mafefe. There are no specific criteria, but if the person comes from another village, a "trek-pass" is required from the former chief stating that the person is not fleeing from punishment, has not committed a serious crime and can in general be regarded as a suitable person. If citizenship is granted, a written document is issued giving Permission to Occupy (PTO). The PTO entitles a person to a piece of land in the area. Once land is owned, it can be rented but change of ownership must be negotiated. The Kgoshi also indicated that once a piece of land has been allocated, it cannot be taken away and it is inherited by the owner's offspring. However, household 8 in the study indicated that they had lost land which had been allocated to them because they did not utilise it for some time. They were scared to ask for its return because "it had been given away by the Kgoshi".

2.2 Organisations and institutions in Mafefe

Thom (1996) provided a detailed description of organisations and institutions in Mafefe. A brief summary from Thom (1996) as well as information gained from interviews with the Mafefe Development Council, Community Centre and the Transitional Rural Council will be provided in the following section. The Electricity Agency will be discussed in section 2.1.4 below.

2.2.1 Mafefe Tribal Authority

The Mafefe Tribal Authority (TA) consists of Kgoshi SG Thobejane and the Tribal Council (TC). The Tribal Council comprises the headmen and headwomen of the different villages. Until the establishment of the Transitional Rural Council (TLC), the TA was the

official local authority in Mafefe. The TA established the Mafefe Development Council (MDC) on the initiative of Kgoshi Thobejane in 1991. The Mafefe Electricity Committee (MEC) was a sub-committee of the MDC. According to Thom (1996) the MEC was the only identified sub-committee of the MDC but according to the Kgoshi it is "made up of several sub-committees such as the Water and Sanitation Committees". An interview was organised with the MDC but only four members turned up. It was explained that the MDC is an elected committee, elected at a public meeting and officials hold office for three years. Their work is concerned with the development of Mafefe in general and the MDC consists of the following sub-committees:

- Electricity
- Road & Transport
- Tourism
- Water
- Sports & Recreation.

Every village is supposed to have its own sub-committee of each sub-committee and representatives attend the Mafefe Development Forum. The Mafefe Development Forum (MDF) was an umbrella structure which was established in 1991 and had the following affiliates:

- Mafefe Care Group
- Mafefe Employment Creation Committee
- Mafefe Farmer's Association
- Mafefe Health Committee
- Mafefe Sanitation Group
- Mafefe Water Committee
- Mafefe Women's Group
- National Nutritional and Social Development Programme (NNSDP)

The Tribal Council [Kgoshi] is *ex officio* on the committee. It was stated that they also "work with the TLC". The Development Council initiated the electrification process and councillors were involved in the negotiations. The Electricity Committee, is responsible for liaison with the community and with Eskom and to see that all villages are electrified.

The interview was terminated after a very short while when a question about a road being built in Mafefe was put to the MDC. The chairperson, Mr Manailana refused to answer questions not concerned with electricity. He then said that someone was calling him from the door. He went outside followed by the other three members present. A few minutes later they returned and he said that they were not prepared to answer any more questions. It later transpired that the road building project is a project of the Transitional Rural Council (TLC) and not initiated by the MDC as suggested by the Kgoshi. The reason provided for terminating the interview was that not enough members of the MDC were present and that another interview would have to be arranged over the weekend with the Kgoshi present and when those members of the MDC not resident in Mafefe could attend. However, this could not be arranged within the research schedule. The chairperson informed us that "most members" did not live in Mafefe and this confirmed other information that the majority of the MDC are not normally resident in Mafefe. During the short meeting they appeared ill at ease and the impression given was that they were unhappy talking to the researchers. As soon as they found an excuse they called the meeting off.

The incident underlined the tension and mistrust between the traditionally aligned structures and the elected structures in Mafefe. It is also an illustration of the impact of unresolved political issues on decision making about energy issues at local and community level.

We were informed by other structures that most of the MDC committees existed only on paper and that they have no projects or funding. Provincial and national government policy is to channel projects and funding through democratically elected structures like the TLCs and it is therefore unlikely that the MDC will attract any project funding from any source. The electrification project is therefore, the only tangible project under the control of the MDC and the Tribal Office and for this reason it is jealously guarded.

Since the research took place, the Kgoshi has confiscated all moveable equipment belonging to all projects in Mafefe. This equipment has been moved to the Tribal Authority buildings. This has been justified on the grounds that the Kgoshi owns Mafefe and everything in it. The MEC for Safety and Security has visited Mafefe and instructed the Kgoshi to hand everything back or risk prosecution. Whether this directive has been complied with is unknown.

2.2.2 The Transitional Rural Council

The Nokotlou Transitional Rural Council, which included Mafefe and neighbouring area Mathabatha was established at the beginning of 1995 in terms of the Local Government Transition Act. It was comprised of 13 members representing organisations such as the ANC, Contradosa, TC, the Mafefe Development Forum and the Mafefe Development Council of which the Electricity Committee formed a part. The Kgoshi had *ex officio* status on the TLC. TLC was the interim local authority responsible for Mafefe until the local government elections on 1 November 1995.

The situation at Mafefe needs to be seen in the context of the new dispensation in South Africa and in particular the position of Chiefs and Tribal Authorities within it. The tension and conflict between the TLC and the Kgoshi was highlighted by the Kgoshi:

Theoretically this government recognises chiefs but in fact they are trying to do away with them through the TLCs. The TLCs have the welfare of the people within their jurisdiction, and this is the same as the duty of chiefs toward their people. The government negotiated with the civics at Kempton park but not with the chiefs. The model they have developed may fit urban areas but it is not appropriate for rural areas. The problem is that the roles of the TLCs and the traditional authorities are not clearly defined and this can lead to conflict in the community.

An interview was also conducted with the TLC representatives from Mafefe. It was pointed out that the TLC covers a larger area than just Mafefe and includes the Tribal Authorities of 16 Kgoshis. The representatives from Mafefe make up two out of the total of ten representatives on the TLC. The tribal authorities should be represented on the TLC but they can't "get their act together" to elect one of them to be their representative. The Tribal Authorities also can't agree on development issues and they don't accept that development issues should be within the jurisdiction of the TLC. In this regard Mafefe is not unique.

Before the TLC existed, there was no civic or SANCO branch. The TLC grew out of the different development forums and there are moves to establish a SANCO structure in Mafefe in the future. The committees represented at the Community Centre had become the development organisations of the TLC. They are effectively one organisation.

At the time of the elections for the Rural Councils in the Northern Province, the Kgoshi had openly backed two candidates for the local council. Both of these candidates were defeated and the Kgoshi was humiliated by the result. One of the defeated candidates is the chair of the Mafefe Development Council (MDC). The election results appear to have exacerbated the tensions.

The TLC representatives alleged that the Kgoshi had been giving the headmen R40 a week to keep them happy and supporting him. They felt that the Kgoshi was trying to establish "his own world" in South Africa. Their views are that the Kgoshi should restrict himself to dealing with customary affairs. Development must come through the elected democratic structures. If this could not be effected, the relevance of the elections should be questioned - "why did we have elections?" However, the Kgoshi also wants to be identified with development.

The Kgoshi attempted to have the councillors fired, but had failed. Most people opposed to the TLC are civil servants or former civil servants from the old Lebowa government. The TLC representatives believe that the Kgoshi's policy was failing and that peripheral areas were losing trust in the Kgoshi. They felt that the Kgoshi should be above politics. If he was seen to be taking sides in an election it could only divide the community, which is not good for anyone. Attempts were made to start a process of mediation between the TLC and the Kgoshi but were never realised.

According to the TLC representatives, Eskom indicated to them that from next year they will start dealing with the TLC. When Mahlajane is to be electrified, it may be done through them. The TLC representatives believed that the reason they have been dealing through the tribal office is that they initiated the project some years ago. The TLC representatives expressed their unhappiness with the electrification process. The Kgoshi signed the contract with Eskom and strongly identifies himself with it. Electrical appliances suitable for the limited electricity supply (irons and kettles) are even being sold from the Kgoshi's house and not from the Electricity Agency's office. This prevents people from complaining because "to complain about the electricity is to complain about the Kgoshi". That is culturally unacceptable. If there was an elected democratic representative committee in charge, people would feel much more free to complain. The comment was also made that the present electricity committee does not even live in Mafefe. Further, electrification should be carried out for the whole area covered by the TLC and not just Mafefe and it should be done through the TLC. After the research field work had been completed, it was learned that due to the conflict in Mafefe, all development projects were halted, including the electrification project. Although this was not confirmed by Eskom, the possibility of further electrification projects and subsequent co-operation with the TLC seems remote. The danger also exist that, should Eskom co-operate with the TLC instead of the Electricity Agency, more conflict could be created. One suggestion could be to create an independent electricity committee with community representatives as well as representatives from the TLC and the Electricity Agency. The committee could work directly with Eskom although conflict would probably prevent representatives from the two organisations from working together. The practice of selling appliances from the Kgoshi's house should be stopped. It contributes to the confusion surrounding the role of the Electricity Agency and the services that are supposed to be delivered. It also links the Kgoshi directly with the electrification process and should be changed to reflect a more balanced involvement.

The electricity supply as well as the method of payment is also cause for unhappiness. Before electrification everyone had agreed that they wanted to pay by coupon/card, but it was changed and nobody knows why. No clear explanation for the disregard of the stated community preference was found apart from the explanation provided by Consulting Services (1996): "The reaction of the majority of the residents (on being consulted if they would prefer 2.5A or 20A) indicated that they would prefer the 20A option, which in Eskom's view jeopardised the 2.5A supply project". Eskom then established that the 20A option would require a R300,00 connection fee and R150,00 deposit.

2.2.3 The Community Centre

The Community Centre houses a number of different committees concerned with community development. These committees have been functioning for varying amounts of time:

1.	Health Committee	10 years
2.	Water	9 years
3.	Environment	3 years
4.	Farming	9 years
5.	Sanitation	3 years
6.	Women's League	8 years
7.	Road & Transport	1st year
8.	SACC	2 years
9.	Sports & Recreation	2 years
10.	ANC	5 years

All the projects with a common interest in the development of Mafefe came together to establish the Community Centre. The Mafefe Development Forum (MDF) is the umbrella body for all the committees. All villages are represented on all committees and each village nominates or delegates a member to each committee. The projects are funded through donor funds from Mvula Trust and IDT.

Protests occurred over the Christmas/New Year period staged by supporters of the Kgoshi and aimed at the MDF. The police were called in since there seemed to be the potential for violence. Since the Kgoshi appears to see himself as the embodiment of Mafefe and to personally identify himself with the processes of development, any development project set up independently of the Kgoshi is seen as directly challenging him and his authority. This culminated with the locking up of the Community Centre and confiscating all the tools (including picks, shovels, cars and bakkies) of all projects not under the Kgoshi's control early in 1997. Despite the intervention of the Provincial Government, the situation has not improved dramatically. The confiscated property remains with the local police station and the Community Centre remains padlocked.

The Community Centre was not involved in the electrification project in any way, not even in community education. However, representatives indicated that the Centre would have the capacity to undertake education if they were asked and trained. They feel that there should be more basic education on electricity usage and safety. They believe that the cables are not safe uncovered on the walls of the houses; children can tamper with them and cut them. The Community Centre is already involved in education around Aids and TB (Health Committee), water and sanitation, and the ANC conducted voter education through the centre. Utilising the Community Centre for much needed electricity use and safety training could be a starting point to address the severe lack of information and training around electricity issues.

The Community Centre representatives did not know which individuals were serving on the Electricity Committee or how they were appointed. They did not think it was elected by the villages but was appointed by the Tribal Authority. The Tribal Authority used to be represented in the MDF and the present Kgoshi used to work on the Health Committee before he was installed as Kgoshi. However, things changed after the local government elections in November 1995. Those elected to the TLC were not favoured by the Kgoshi and he began to threaten the Community Centre. He even tried to get them evicted from the building they use although it was originally given to them by the Tribal Authority under the previous Kgoshi. They have also been accused of misusing funds by the Kgoshi. The MDF would like to work with the Kgoshi rather than compete with him and they would like someone to come and mediate between them.

The Community Centre provides training about TB. SANTA provided training for health education in general as well as education on STDs and Aids. They also take patients to Groothoek hospital 98 kms away as no ambulances come to Mafefe. They also take asbestosis victims to Johannesburg where they can make their claims for compensation. They have a car donated by the IDT but the patients have to pay for the petrol as they have no funding for that. They are not paid for their work and are volunteers.

The Water Committee is working on a project to bring water to Mahlatjane with Mvula Trust and IDT. An organisation called Tsogang is providing the training and facilitation. The Tribal Office (Development Council) has a water committee as well, but representatives from the Community Centre don't know who the committee members are. Trenches were dug for pipes at Dublin but they appeared to run out of money after about two weeks. The Community Centre has been working with Mvula Trust in building dams and installing the pipes to bring water from springs in the mountains.

The Sanitation Committee has been installing VIP toilets and education around the importance of sanitation using drama as a teaching method. In terms of agricultural development, the Agricultural Committee receive help from the extension officer based in Mafefe. They are a mixed group of both men and women.

The CARE Group falls under the Health Committee and they visit homes to check up on the health of children and give advice on nutrition. They also teach people about the importance of fresh vegetables and how to grow them. They used to have a community garden at the clinic which they had raised the funds for. However, the Tribal Authority started its own Care Group and said the garden belonged to them. The Community Centre's Care Group pulled out of the garden and left it to the Tribal Authority.

The Environmental Committee is not active as a result of disagreements. They used to have a recycling project but it has now stopped.

2.3 The Electricity Agency

2.3.1 Structure

An agreement between the Tribal Authority and Eskom led to the establishment of the Electricity Agency (EA). The personnel of the EA are employed by the Electricity Committee which forms part of the Tribal Authority. Eskom was not involved in the appointment of any EA employees but the Workers' Committee lobbied the Electricity Committee to lower their initial requirements for employees. According to the EA, the positions were advertised and anybody could apply. According to the interviews conducted with the Workers' Committee (elected by and from the ranks of the local labour force employed through the labour-based construction process) and Eskom, the maintenance personnel of the EA was selected out of the labour force working on the electrification project because they were the best two workers. Training was provided by Eskom.

There are four people employed by the Agency, two in the office on administration and two as maintenance workers. The Agency posts were advertised in the community and people could apply for the positions. The applications went through a selection process and the decision on who to employ was taken by the Electricity Committee and not by Eskom. The Agency has use of a car given to them by the Electricity Committee but still owned by the committee who also maintain it. They have a two-way radio, and if there is a problem on the technical side that they cannot deal with, they use it to contact Eskom in Steelpoort who can respond very quickly if there is an emergency.

The EA seems to have a subordinate position in terms of the Electricity Committee - "The Agency only do what they are told to do; the contract was signed between the Tribal Authority and Eskom". The Electricity Committee (as a sub-committee under the TA) informed people about the increase in the charge from R8.50 to R15. Complaints about the increase have not been directed at the Agency directly or officially, but they were aware of a rumour that there were elements in the community who were not happy with the increase. If they get any complaints they direct them to the Electricity Committee. Whenever there are problems with people who don't pay, the Agency contacts the Electricity Committee which tells them whether to disconnect or not. Eskom tells the Committee who to disconnect and they in turn tell the Agency. The decision lies with Eskom and not with them. People are not normally disconnected until after 1-2 months of non-payment. Of the 790 connections (2.5A), more than 50 people have been cut off so far as a result of non-payment. All the disconnections have taken place since the increase to R15 - there were none at R8.50. This was confirmed by Eskom in Pietersburg. It is interesting to note that Eskom knew of the proposed boycott although the Agency did not. None of the 20A and 60A customers have been disconnected. There used to be a reconnection fee which was seen by some as a "fine". There seemed to be some confusion over whether a reconnection fee was charged. After a visit from Eskom, misunderstandings were cleared up between the Agency and Eskom.

2.3.2 Role, functions and efficiency of the Electricity Agency

The Agency is contracted to fulfil the following functions:

- provide advice on the safe use of electricity;
- provide advice to households on the most effective way to do house wiring;
- to accept electricity payments on behalf of Eskom;
- to maintain an accounting system of payments received;
- to deal with any problems around electricity experienced by households;
- to inform Eskom (Steelpoort) of any technical problem that they cannot deal with;
- to inform the Electricity Agency about cases of non-payment;
- to disconnect those households which have not paid on instruction of Eskom via the Electricity Committee

The administration personnel are responsible for taking in payments and doing the accounts, although the bills for the conventional supply connections are issued from Pietersburg. If someone has not paid they remind them that payment is due. The

administrative personnel have not yet received any training from Eskom although this has been promised. They have been shown bookkeeping skills by a person from the school but they feel they need more training.

The maintenance workers are responsible for dealing with any problems that the people have with electricity. They also read the meters for those with conventional (20A & 60A) electricity, and disconnect those who have not paid. They underwent training by the sub-contractors (EPO) in wiring the distribution lines. Whenever they have technical problems they cannot deal with, they contact Eskom at Steelpoort.

The Agency advises people on how to handle electricity safely and how to best do their wiring.

The Agency staff are paid salaries by the Electricity Committee with money drawn from the payments by the residents. People can buy appliances from the Agency, but the Agency doesn't keep them. They are kept at the Kgoshi's house and are being sold at the following prices:

Electric iron	R60.32
Kettle	R53.33
Plug	R6.50

2.3.3 Problems associated with the Electricity Agency

Problems associated with the Electricity Agency can be grouped as follows:

2.3.3.1 *Lack of adequate communication and information dissemination*

Community members as well as community organisations such as the Community Centre were ill-informed about the functions of the EA. They were not sure how people were appointed. People were unsure if members of the EA were elected or appointed and the effectiveness of the advertisements for the positions can therefore, be questioned. Nobody was aware that the EA is being paid from income derived from electricity payments. Especially in the light of the controversy surrounding the increase from R8,50 to R15,00, this could be regarded as unacceptable by the residents. It also raises the question of the effectiveness of communications by the Electricity Committee and their method of disseminating information to the community. Since it was also the Committee's responsibility to inform the people of the increase and nobody had been informed before they went to pay at the EA, it clearly illustrates the ineffectiveness of the Committee.

Specific criticism was levelled at the Agency and the Committee for the fact that people were not informed about the price increase. People expected Eskom to inform them and explain the reason for the increase. It can therefore be argued that the Electricity Committee was not fulfilling their function regarding information dissemination.

No household indicated that they had made use of any other service apart from buying equipment and making payments at the EA office. The EA is therefore not fulfilling all its functions as they are required to provide advice on the safe use of electricity or the house wiring, as agreed. The EA office consists of an office within the building housing the Tribal Authority. Apart from one Eskom poster on electricity safety no information material was visible. Their effectiveness in providing safety information on electricity as well information on what appliance can be used with the limited supply (a clear need identified from interviews with households) can therefore be questioned.

2.3.3.2 *Unprofessional behaviour*

Unprofessional conduct was also experience by one of the respondents (household 11) when her electricity had been cut without warning by Mr van Rooyen of the EA. She had applied to move the electricity to her newly-constructed house but was not informed when it would take place. She is a hawkers and had bought a fridge to enable her to sell various products. The electricity was disconnected when she was busy with her selling activities and as a result all the food was spoilt in the freezer. Not only was the electricity cut in an unprofessional manner but it was also very unsafe, The Agency left the stump of the cable sticking out of the ground and this could be dangerous for children. The respondent wrote a letter to the EA, requesting a refund on her pre-paid electricity for the days lost, compensation for the loss of the food in the freezer and immediate

reconnection. She also informed them that a copy of the letter would be sent to Eskom. The immediate response was to ask her not to send it to Eskom and Mr van Rooyen promised to reconnect the electricity the next Monday. During the second field visit, the electricity had been reconnected but she had not received any compensation.

2.3.3.3 Legitimacy

Households did not distinguish between the Tribal Authority and the EA and in some cases between the Electricity Committee, the EA and the Kgoshi. Households seem to regard them as one, with the function of accepting payment as well as selling bulbs, lampshades, wire and appliances. The intertwined nature of the EA, the Tribal Authority and therefore also the Kgoshi and the Electricity Committee, caused people to lump them together. People referred to the EA and Electricity Committee in such a way that it was clear that they were regarding the organisations as one.

In terms of the social dynamics of Mafefe, the alignment of the EA with the Tribal Authority and the Electricity Committee is unfortunate, especially from Eskom's point of view. If the "social survey" completed on behalf of Eskom before the electrification project started had been effective, more insight might have been gained in the position of the Tribal Authority and the Electricity Committee. As an utility, Eskom should not be seen to be linked to any specific faction in the community and a more neutral organisation might also serve the community better. It was notable from interviews conducted with households that those households supporting the Tribal Authority were much better informed about the role and functions of the EA. Households supporting the TLC and the Community Centre were less informed, and the EA therefore can be regarded as not serving the whole community on an equitable basis.

Eskom seems to have attempted to establish an organisation closer to the community which could fulfil functions that should technically be fulfilled by Eskom. The idea of bringing Eskom closer to rural communities is a sound one but the vehicle for achieving this should not be an organisation specifically aligned with certain groupings in the community. The effectiveness (or lack thereof) of such an organisation can also contribute to the public's perception about Eskom.

2.3.4 Replicability of the concept of an Electricity Agency

In terms of the establishment of the EA, it can be argued that employment has been created, capacity-building effected in the community and services can be rendered more efficiently and quickly. On the other hand, the effectiveness of the service can be questioned, and community members still viewed Eskom as the responsible organisation with regard to electricity. It was clearly indicated that Eskom should have informed them of the increase in the flat-rate, and some households indicated that a letter would be sent to Eskom to request a meeting. Instead of rendering a more effective service, Eskom is experienced as inefficient and removed from the people.

Households also had no information on how and when decisions to cut off the electricity were taken. They did not know whom to approach about difficulties with payment or requests of extensions or if arrangements could be made about payment. This information can be regarded as vital for households balancing on the knife edge of survival and strengthens the argument for a more flexible payment system. This was echoed by most of the households who indicated that they would have preferred a pre-payment or card system.

The Agency as it exists within the framework of the Tribal Authority and the Electricity Committee does not seem to be a politically viable model. An independent or more neutral agency, possibly directly linked to Eskom and supported by Eskom would prove a better alternative. The chain-of command (currently flowing from Eskom, to the Electricity Committee to the Electricity Agency) in terms of disconnections, reliance on support and acceptance on behalf of Eskom suggests a strong relationship which could be managed and administered directly by Eskom without alliance to any specific faction or group within a community. Eskom indicated that the continued relationship with the EA was dependent on the effectiveness of its service and functions. It was acknowledged by Mr Baloyi from Eskom that there was a need to place a full-time person in Mafefe to work independently of the Agency and the Committee to evaluate and monitor the project.

Lastly, it was emphasised that the agreement to set up the Agency was also part of the pilot study. As stated earlier, the philosophy behind the envisaged functions and role of an organisation similar to the Agency cannot be criticised. Matters such as the political alignment, financial viability and monitoring as well as accountability of the organisation, however, need to be addressed.

3. The electrification process in Mafefe

3.1 Background

The electrification process was initiated by the Mafefe Development Council through a sub-committee called the Mafefe Electricity Committee or EC. The Mafefe Development Council was established on the initiative of the current Kgoshi in 1991. The Kgoshi was directly involved in the electrification process and appears to be the one responsible for bringing electricity to Mafefe. "The chief told them that the electricity was coming and they must have it". The reason why electricity was given such a high priority is unclear and one respondent commented that if she could choose between water from a tap and electricity, she would choose water. It does not seem that residents were entirely against electrification, rather that they were unsure how it was awarded such a high priority when there are so many other development issues in Mafefe.

The Electricity Committee liaised directly with Eskom in negotiations during the electrification process and it is also responsible for liaison between Eskom and the community. Eskom and the EC appointed VW&L as the contractor to undertake the electrification of Mafefe.

3.2 The electrification process followed in Mafefe

Negotiations started in 1994 between Eskom and the EC and after a meeting on 24 October 1994, VW&L was appointed as contractor for the electrification process. It was decided that the construction process would be labour intensive and employ residents of Mafefe. (For a more detailed discussion of the labour-based construction process used in Mafefe see section 4 below.)

On 31 October 1994 VW&L conducted a local site survey at Mafefe and on 6 November 1994, a meeting was held with the Electricity Committee. During the same period, productivity tests for digging holes and planting of powerline poles were conducted and a social survey was conducted to establish the existing energy use patterns and the sentiments regarding electricity (Raft, 1994). Interviews were conducted by staff from VW&L and the Electricity Committee. Results of the survey (which was based on a very small sample) indicated that 32% of the Mafefe population appeared to be earning more than a R1000,00 per month, while 55% of the population earn less than R500,00 per month. The survey also found that "in general people are looking forward to being able to change to electricity and we have no reason to be concerned about a willingness to pay for the service" and "we are satisfied that the consumers will generally benefit financially by changing to electricity". These statements are indicative of a total misunderstanding of the role of electricity in rural areas, the general prevalence of poverty as well as people's ability to pay for the service in Mafefe. A neutral, more objective organisation would have been in a much better position to provide an unbiased report.

According to Mr Wylie, a workshop was held at Mafefe on 12 and 13 November 1994. This meeting was attended by between 500 and 1000 people and was held at the tribal offices. It was addressed by Van Wyk & Louw (VW&L), Eskom, as well as by academics from Unisa. VW&L outlined the project and the Unisa academics were responsible for issues such as public participation, community involvement and the social issues raised by electrification. From this meeting VW&L also obtained from the community an expression of their needs and expectations. VW&L outlined various proposals for the electrification with the costs of those options. They explained why they were choosing the option they had, and those present said they accepted the proposal.

The EC recruited labourers for the electrification project and set criteria through which the employment of women was given priority. The labourers formed a Workers' Committee made up of elected representatives. The Workers' Committee acted on behalf of the labourers during the project. Neither Eskom nor VW&L had any say in which houses were to be connected. It was the responsibility of the Electricity Committee under Phineas Molatlole to market the idea to the community. Eskom, according to Wylie, functions on the assumption that everyone will want electricity and the contractor's job is simply to reticulate every household. However, when the labourers approached the individual houses to be electrified, not everybody wanted electricity. This

was usually because the person had not been to the mass meetings and did not understand what was happening. When this happened they (the workers), tried to explain what it was about and persuade them to take electricity. Usually they were successful, but if someone refused electricity they simply omitted those houses. This occurred in only a few cases. According to the Workers' Committee, most people who have electricity seem to be happy with it. Even those who were unsure or opposed to having it at first were happy "once they began turning the lights on".

Certain households indicated that they were not aware of the electrification project and that they had heard about it for the first time when they were approached to be connected. They did not know the people who approached them: "Some people came and explained about the electricity" and "nobody explained anything". Consequently, households were not informed about the cost of the flat rate, the increase after six months or any supply and tariff options. Although not all households were uninformed, households 1, 2, 6 and 8 indicated that they were totally uninformed about the electrification project. Household 8 indicated they were "forced to have electricity" and "nobody told them anything".

The fact that the workers approached the individual households also created problems. Since the workers were paid on a job-related basis, the more houses they could electrify, the more work done and the more they were paid. In this way, households who should have been better informed before electrification so as to be able to make a more informed choice, were all electrified. A house was pointed out to the researchers that had been standing empty for nearly two years, but which had nevertheless been electrified. Eskom and VW&L had no interest in restricting the households to be connected - the more connections the higher their income. The unfortunate losers in the whole process were the households. They now have to pay for a service which they might not have wanted in the first place or in the form in which they are currently receiving it.

3.3 Community participation and choice

Although the workshop held on 12 and 13 November 1994 was attended by between 500 and 1000 people according to Wylie, it seems that community participation in the electrification project was limited. The only real participation was through the labour-based construction process. Increased community participation, especially during the planning of the electrification project could have contributed to the success of the project since Eskom and other role-players would have been better informed about the conflicts in the community, taking power relations in the community into consideration and approaching the process in a more balanced manner. Instead of aligning with one faction in the community, an attempt to be an impartial service provider could have been made.

Households had very little choice in the whole electrification process. First, some households seemingly did not have the choice to be electrified. Secondly, there was virtually no choice in the supply system. If the household could not afford the R450 connection fee they were given the 2.5A supply. In practice the majority had little choice; it was only the more affluent households who could afford the higher connection fee who were able to choose. The majority of the households also indicated that they would have preferred a pre-payment or card system for budgeting purposes. They were confused because they did not receive the pre-payment system since that was what they wanted. During the workshop held in Mafefe on 12 and 13 November 1994 VW&L outlined various possibilities as well as the cost of each possibility for electrification. According to Wylie, the people present accepted the proposal. It is however unclear which proposal was put forward to the workshop and consequently accepted by the participants. Only one household indicated that she attended the meeting held at the Tribal Offices. Other households were therefore uninformed about the choice.

The electrification process is closely linked to the clashes between the Tribal Authority and the TLC. In the case of Mafefe it can be argued that electricity was used by the Tribal Authority and Kgoshi to strengthen their position within the community.

4. The labour-based construction process used in Mafefe

4.1 Background

The electrification project consisted of two phases: Phase 1 was the construction of approximately 20 km of 22kV powerline from the Havercroft mine to the Mafefe area and Phase 2 comprised the reticulation of electricity to two villages identified by Eskom in the Mafefe area. According to Wylie the project was divided in the following manner:

- Phase 1 - feeder line to Mafefe
- Phase 2 - reticulation of 672 stands
- Phase 3 - Electrification of Gemini (212 stands)
- Phase 4 - Electrification of Fertilis (260 stands)

The project was identified as a possible labour intensive project by Eskom and after a meeting on 24 October 1994 between Eskom and the Electricity Committee, VW&L was requested to present a budget for the first phase of the project. After approval of the budget VW&L proceeded with interaction with the community of Mafefe. During the same meeting VW&L was briefed on the needs of Eskom and the Electricity Committee. This included a recommendation that a contractor, preferably from the Northern Province be appointed as a Construction Manager in order to provide only those skills, equipment and tools that were not available in the community and to maximise the use of locally recruited labour (Raft, 1994). The contractor appointed was EPO while VW&L provided detailed supervision and support with labour and training matters.

Payment was not linked to a daily rate but to a task-related budget. In order to get an idea of the time and pricing structure for the various jobs, field trials were undertaken in Mafefe for such things as digging holes and trenches in various substrates. From this a "measuring stick" of the time and numbers of people needed to undertake various tasks was obtained. This was then used to budget for the tasks. These field trials were done by community members from Mafefe so that they would equally have an idea of what was involved and how the budget was arrived at. It was decided that the job could be broken down into various tasks for the workers and these were priced at a rate of R20 per person per day:

Digging a hole - two people dig one hole per day,	R40 per hole
Dressing poles - two people dress 20 poles per day	R2 per pole dressed
Planting a pole - 16 people plant 10 poles per day	R32 per pole planted
Stringing wires etc. etc.	
Finishing wires etc. etc.	
Digging trenches etc. etc.	

The role of the contractor (EPO) was to

- supply the administration
- supply on site transport
- supply tools and equipment
- supply materials
- supply all training

A condition of the contract was that they were not allowed to undertake any work themselves. On one occasion they did undertake some work over a weekend to alleviate boredom, and the workers' representatives complained immediately to the contractors and it never happened again.

Recruitment of the labour was undertaken by the people of Mafefe, in particular by the Electricity Committee under Phineas Molatlole. The committee set the criteria in which women were given priority - unemployed single women with children first, women with unemployed husbands next etc. VW&L gave the committee the numbers that would be required.

Women were restricted to digging trenches and the other jobs were done by men. Mr Wylie was not against women doing any of the work but felt that planting the poles was too heavy for women. However, VW&L went along with what the community decided. There were complaints about unfair practices in the hiring and that friends of members of the Electricity Committee were given preference. According to Mr Wylie, allegations were investigated but found to be untrue. Where there were some problems with "trouble makers" the committee was advised not to hire these few in the subsequent phases.

The workers elected their own representatives and these were always present at site meetings and their reports given a specific agenda item. The Kgoshi also attended all site meetings as did representatives of the Electricity Committee. Besides the direct work on the electrification, the wages clerks were also drawn from the community and trained.

As the number of workers needed to be reduced as the project developed towards completion, these reductions were negotiated with the workers representatives and they were accepted after negotiation.

All training was given by the sub-contractor EPO and not by VW&L. VW&L are very impressed by the standard of work which suggests that the training was good. All training was given to all the workers so that they could move between jobs. Raft *et al* (1994) referred to the training as *labour enhancement* rather than training, and that he hoped that people had learnt "life skills" that could be useful in other areas. Certificates were given for each area of training and the workers were covered by workmen's compensation.

The problem, according to Wylie, is that there is now a highly trained workforce in Mafefe but no employment opportunities. He said that they were now so good at their work that he would be happy to employ them directly without a sub-contractor and just with a clerk of works to keep an eye on things.

Eskom entered into an agreement with the community, and the two best workers were further trained in maintenance and servicing. The basic rule here is that these people can do everything outside of the sub-stations on a "feet on the ground" principle. In other words, they may not service overhead wires - they can do everything provided their feet never leave the ground.

Wages were worked out on the estimation of time and the amount of labour required for each task. This was supposed to ensure that the workers could earn a minimum of R20 per day. However, if workers were able to raise their productivity, they could earn more, and some people were able to earn up to R60 per day on occasions. As the labour force became more experienced they felt they should be paid more and it was agreed to put the basic wage up to R25 per task. By the time of the final phase, the electrification of Fertilis, the representatives were asking for R30 per task. VW&L agreed that this could be met, but only by raising productivity and reducing labour. The representatives agreed to this. As a result of this agreement the cost of reticulation was lowered still further to R1300 per household. Mr. Wylie estimated that women in Mafefe had earned R40,000 for digging trenches.

Mr Wylie was very enthusiastic about the success of task-related contracts with the community. Besides any benefit to the community itself, it kept costs down for the service provider (Eskom) and possibly increased the profits of VW&L. Normally Eskom puts the cost at R37000 per km for feeder line and this was reduced to R22000. Furthermore, Eskom normally budgets on R3000 + per household for reticulation, while VW&L managed it for R1600 per household in Mafefe, and in Fertilis this had been further reduced to R1300 per household. VW&L was also impressed by the way the work went. There was good participation by the community - "The community made the project their own". They felt that they would use the method of task related contracts and community participation again wherever they could, but felt that it would only be successful in a homogenous community. They did not think it would work in a township where there might be different and competing interest groups. The fact that Mafefe is viewed as a homogenous community clearly illustrates a lack of understanding of the community dynamics in rural electrification in Mafefe.

Although VW&L and Eskom were satisfied with the labour-based construction process, the Workers' Committee for the electrification project pointed out various difficulties - "They liked the work but there were problems". The workers did not receive any work clothes - they had to provide them themselves. They were also not issued with any safety equipment like hard hats and one of the workers was injured when something fell on his head. If they were injured or fell ill at work, they were told that they were covered by workmen's compensation. If, however, they fell ill at home they did not receive compensation, even if their doctor gave them a letter saying that their illness was a result of their work. People also sometimes injured themselves with a spade while digging, but EPO always said it was not serious and would not take them to the clinic. One person suffered a chest injury which is still troubling him, but EPO did not take him to the clinic.

They were also not satisfied with the payment system which was based on "piece work" instead of a daily rate. If it rained and they could not work, they did not get paid. Also, if the sub-contractors, EPO, did not have materials ready and on site, they could also not work and did not get paid. The workers would have preferred a daily rate which would have given them a secure income for the duration of the project.

They had no transport or transport allowance to and from work. Some of them came from the other side of Mafefe and found it difficult to get to and from work. As a result some of them had stayed in the works camp at Fertilis.

All of them were trained to do everything and they feel confident in their ability to do the work. They all did all aspects of the work, except the women. Women only dug the trenches for the cables - everything else was done by the men. The criteria to employ women was set by the Electricity Committee while the restrictions on the work of the women was an EPO decision but supported by the Workers' Committee "because most of the work was too heavy for women". They did acknowledge that if "a women was very determined" she could have done some of the other work. After training they were issued with a certificate from Van Wyk & Louw. Eskom indicated that they were willing to train six people to maintain the system for the Electricity Agency and six people were identified. The Electricity Committee then required applicants to have a matric and a driver's licence. Only two applicants met both these requirements, but the workers argued with the Electricity Committee and they eventually agreed that all six would be trained. Four of them have been trained so far and the other two are due to go for training.

Workers started working at 8.00am and finished at 4.00pm. They could work according to their own hours since the work was based on "piece work"; they could, for example, start at 7.00am and finish at 5.00pm if they wanted to. It was up to them to decide to take lunch or how long they took for their lunch. They did not like this system because they needed regular lunch times "when they can sit and discuss things together". They felt the work was priced too low. One hole took two men one day to dig. It was possible to dig two holes, but "then your body was so tired and sore you could not sleep properly at night or work properly the next day". At first they were paid R20 each to dig one hole. On Phase 2 they believed that this had been increased to R50 each or R100 per hole. Van Wyk & Louw denied this, saying that it was only R50 per hole or R25 each. The workers representatives said they had seen the figure in the contract, but when they tried to get a copy of the contract from EPO they found that it was missing. This dispute led to a three week strike which ended in the workers accepting the R25,00 rate proposed by the contractors.

The Workers' Committee was elected as the representatives of the workforce during Phase 1 of the project. They felt they were able to achieve certain things by negotiation; they were able to negotiate increases and they stopped EPO personnel working at weekends when they tried to. Also, it seemed at the beginning as if some of the workers were not receiving their full money from EPO, but the committee sorted that out as well. They had called a three week strike during Phase 2, but this achieved nothing. At the beginning of the project there were 50 workers, but as the project is now nearing the end, some of the workers are being retrenched, and there are now only 28 left. EPO decides how many are to be retrenched and who they will be.

4.2 Assessment of the labour-based construction process

The process followed for the labour-based construction process is inextricably linked to the dynamics of the whole electrification process. The process was also driven by the Electricity Committee with Tribal Office and Kgoshi links. The Electricity Committee asked for the employment of women and insisted on a contractor from the Northern Province. This can be viewed as progressive and a serious attempt to alleviate the suffering of women in Mafefe. This, however, also resulted in women being the least trained and skilled after the project. Although the labour-based construction process created very limited skills for use after the project, the women who participated in the project had less skills than the men when the project finished. Although the decision to restrict women from certain jobs was supported by the Workers' Committee, no women representatives were elected onto the Committee. The effectiveness of informing the people of Mafefe about the project seems very limited. Out of the 14 households interviewed, only three households mentioned the project and that was only because a member of the family had been employed, or, in the case of a desperately poor family, the son could not apply because he did not have an ID and could not interrupt his schooling. There were rumours of favouritism during the employment but it could not be established if this was true.

The extent to which the community was involved in key decisions can also be questioned. Most decisions were taken by the Electricity Committee and for Eskom and VW&L this indicated community participation. The workshop of 12 and 13 November which was originally meant to inform the Electricity Committee attracted a large crowd and according to Raft (1994) "the whole community participated". Despite this, the general level of awareness amongst the households interviewed was very low.

The training provided to the labour force was viewed as satisfactory by VW&L to the extent that they would be willing to employ the workers directly without a subcontract. However, the workforce only received training for low-skilled activities such as trench digging, planting of poles and stringing and finishing of wires. Women were only allowed to dig holes and therefore were less skilled than the men. One respondent did not refer to her husband as being employed on the project but she said "He had been digging for Eskom in Mafefe". Higher skilled activities which include the final connection and wiring of distribution pillars, distribution boards and substations were not considered "since the volumes of poles and wiring on the project does not warrant the duration of training which is necessary for these tasks". The two best workers were, however, trained in basic maintenance tasks and are currently employed by the Electricity Agency. It can therefore, be argued that the majority of the workforce and especially women did not gain specific skills which could be utilised after the project.

The impact of the labour-based construction approach on livelihoods in Mafefe cannot be analysed in great depth, mainly because only the husband of one respondent had been employed on the project. He was away attending a ZCC church meeting for the week and could not be interviewed. He had been employed since 1995 but was retrenched in October 1996. At first he earned R300,00 per fortnight but that was reduced to R150,00 per fortnight. When he was earning R300,00 he gave his wife R150,00 but when he was only being paid R150,00, he gave her everything. For the household this definitely contributed to the household income, which normally relies on collecting and selling marogo, weaving and selling straw mats and helping with other people's harvests. After the husband's retrenchment from the project, they have had no money to buy food and they had to borrow from the wife's father. No mention was made of any skills acquired by the husband from the project which could contribute to the household income after his retrenchment.

A positive aspect of the employment provided through the project is that it was not only the immediate family or household benefiting from the employment but it also seems to have benefited other family members. One respondent's daughter (household 8), was employed on the electrification project. The daughter does not live with her, but the mother looks after the daughter's three daughters. The daughter contributed to the household income in the form of bread and bath soap which she brought with her on weekly visits. She was only contributing because "she had work this year". It can therefore, be argued that the impact of employment on the electricity project extended

benefits to households which did not have a direct member employed on the project. This can be seen as a positive aspect. The majority of the other households interviewed would not have been able to qualify for employment on the project because they were being supported by remittances and pensions or generated their own income from selling activities or they had formal employment. Household 12 represents a household which should have benefited from the labour-based construction process. The household is extremely poor and (barely) survives by selling wood and making bricks. The respondent was not aware of the project and could have no doubt benefited from it. Two other poor households also did not participate, one because of not having an ID or schooling and the other seemingly because she had been employed on a water project. Again, the success of the information dissemination regarding the labour-based construction process can be questioned and it can be concluded that opportunities to be employed on the project were not equitable for households that could have benefited from the process.

In general, the labour-based construction process presented fewer problems to Eskom and VW&L than to the labourers employed on the project. Aspects such as the issuing of safety equipment should be mandatory - although a saving in the cost of connecting households could be achieved, such savings should not be effected through savings on essentials such as safety equipment. The savings achieved by VW&L and Eskom were not passed on to the workers or the community. Bonuses could have been paid to the workers, for example. The formation of the Workers' Committee proved worthwhile since they succeeded in negotiating a raise in the payment of the workers.

This element should be replicated in other projects to ensure worker representivity. Special attention should, however, be paid to ensure that women are included on the Committee so that the interests of female workers are looked after. The method of payment for the workers i.e. a daily wage or a task related payment should also be discussed with the workers and different consequences pointed out. If a task related payment is chosen, the contractor should ensure that delays caused by the contractor do not cause workers to lose money. The method of arriving at the price of certain tasks should also be clearly communicated to the workers. The contribution of the project to skills transfer and training in the community should also be improved. The "low" level skills taught to workers did not enable them to acquire any skills that could be used after the completion of the project.

5. The households

5.1 Introduction

Fourteen households were interviewed in order to investigate household energy use, acquisition and decision-making around energy sources and services. The use of electricity, the impact of electrification on energy use in general as well as the impact of electricity on household livelihoods are also investigated and discussed in section 6 of the report. The following section is structured to provide a general discussion of household characteristics, composition and factors influencing households in Mafefe. Detailed information on household interviews is presented as Appendix 2 to the report and a profile of each household is provided in section 5.2 below.

Out of the fourteen households interviewed, seven were female-headed (households 1, 2, 4, 5, 6, 8 and 12). Household 11 can also be viewed as a female-headed household since almost all decisions were taken by the woman on her own. Her husband does, however, contribute to the household at irregular intervals and he is assisting with the building of a new house on the house plot. Two female heads of households are also illiterate (households 1 and 8).

Two households (7 and 12) had no regular source of cash income and subsisted on selling marogo, assisting with ploughing and harvesting (7) and making mud bricks, building walls, laps and assisting with building houses (12). Households 9 and 14 derived their income from operating shops either from their home or next to their house. The woman of household 11 was conducting a hawking business, selling mostly away from home at meetings, funerals and the school. The most affluent household was household 13 in which the woman is employed as a teacher and the husband is employed in Johannesburg. Four households from the sample were completely reliant on pensions as a household income. Most pensions were old age pensions but household 6 also has a member receiving a disability pension due to illness related to the asbestos mining in the area. Households dependent on pensions are households 1, 2, 6 and 8. The other main source of income for four households in the study is remittances from family members employed outside Mafefe. These households are household 3, 4, 5 and 10. Two households are supported by remittances from husbands (household 3 and 10) and the other two are supported by a sister (4) and a brother (5). Where households are supported by a husband, as in the case of households 3 and 10, the remittances were larger than in the other cases. Both husbands send home R500,00 as compared to the sister who sends home R200,00 and the brother who sends between R200,00 and R300,00. All households except households 6 and 13 are dependent on a single income although contributions in the form of money or commodities are occasionally made by family members to support the family. However, most households have to rely on a single source of income and the sources of income are mostly pensions and remittances. Livelihood strategies are discussed in more detail in section 5.3. Household income ranged from R1,00 for selling dried marogo (household 7) to a net salary of the school teacher of R1726,53 (household 13).

Households in Mafefe were exposed to various external influences that impacted on individual households but also on the community as a whole. The most important influences that impact directly on households are mining-related illnesses such as lung and stomach cancer caused by asbestos mining in the area and forced removals of households from two areas close to Mafefe. Four of the fourteen households had a close member of the family either ill, dying or already dead due to mining related illnesses. These are households 1, 3, 4 and 6. Only the daughter of household 6 is receiving any form of compensation. Two households experienced forced removals (2 and 7) and household 2 was forcibly removed twice before they settled in Mafefe.

The following table illustrates household size and income of the fourteen households interviewed for the study.

Table 2: Household size and income of sample households

Household	Size		Income	Extra Land
	Adults	Children		
1	2 adults	2 children	R350	No
2	2 adults	2 children	R350 est.	No
3	3 adults	1 child	R500	Yes
4	1 adult	4 children	R200	Yes but washed away in floods
5	3 adults	1 child	R200 -R300	Yes
6	2 adults	7 children	R430	Yes
7	2 adults	4 children	No regular income	No
8	1 adult	3 children	R350 est.	Yes
9	2 adults	1 child	R5000,00 plus from shop	No
10	1 adult	5 children	R500	No
11	2 adults	4 children	R800,00 est	No
12	2 adults	3 children	No regular source of income	No
13	4 adults	3 children	R1726,53	Yes
14	3 adults	-	R4000 plus from shop	No

5.2 Household profiles

In the following section, a profile of each household will be provided. The profiles presented below are summarised from the detailed household profiles presented in Appendix 2. Household profiles will be presented under the following headings:

- Household characteristics
- Livelihood strategies
- Energy use and expenditure

• Household 1

Household characteristics

The household consists of a grandmother, her granddaughter as well as the granddaughter's two children, a daughter aged 12 and in standard two and a son aged 5. Both women participated in the interview since although the grandmother controls the household finances and other important decisions, the daughter physically buys the household necessities and also collects firewood. Both women are illiterate and innumerate.

A relative of the grandmother's late husband stayed with the women for a short while but he has moved back to his own house. While he was staying with them he contributed money and food to the household. The grandmother's pension of R350,00 per month provides the only cash income for the household. She controls the money and is responsible for taking most of the decisions involving money, for example to have electricity in the home. The available money is spent on necessities. The pension cheque is cashed with the market traders on pension day but around R60 - R70 must first be spent before the traders would cash the cheque. This is mainly spent on groceries. Other expenses include school fees for the daughter of R11,00 per year and R10,00 per month for the burial society the grandmother belongs to. Energy expenditure amounts to approximately R20,00 - R25,00 per month (discussed below). They do not have access to water and all their water is fetched from the river daily by the 12 year old daughter. The women do not receive any other assistance, child support or help.

The grandmother moved to Mafefe with her Mozambiquean husband when he found a job in the mines in the area. The move is estimated to have taken place prior to 1950.

Despite such a long period of residence in Mafefe, the grandmother and the granddaughter regard themselves as foreigners. As foreigners, they do not own any extra land apart from the house plot (approximately 45 meters square). They feel that there is no other discrimination against them as foreigners except that they cannot get farming land. The household was influenced by mining in the area since the grandmother's husband died in a mining accident and the granddaughter's mother presumably died of asbestosis. Neither received any compensation or assistance of any kind.

Livelihood strategies

The only household income is the pension (R350,00) of the grandmother. Livelihood strategies include credit at the local shops and borrowing from neighbours. If their credit is already too far extended they might be refused further credit by the shop owners in which case they revert to borrowing. The exact amount of what was borrowed is always returned. They have had to borrow money for electricity but they have never been cut off. A strategy employed to prevent their electricity from being cut is to pay the flat rate immediately after the pension had been paid out.

As foreigners they do not own extra farming land and their ability to plant crops is therefore limited. It is, however, arguable whether they would be able to utilise extra land since they do not have access to extra sources of labour or money to hire labourers. The grandmother is responsible for planting on the house plot but they hire labour for R60,00 to harvest for them. They plant grains (sorghum, mealies) on the house plot for their own consumption as well as for chicken feed. They grind all grains by hand on a grindstone in the yard and seed is kept back from each harvest for planting the following season. They raise chickens for their own consumption and look after pigs for other people in return for a piglet from each litter. The household livelihood strategies are influenced by the fact that the household consist of two females (no additional help although the 12 year old daughter contributes by fetching water for the household) who are illiterate and consider themselves to be foreigners.

Energy use and expenditure

For cooking purposes, the household uses wood (mostly collected by the granddaughter and sometimes assisted by her daughter) as well as illuminating paraffin (IP). For space heating requirements in winter they only use wood because IP is too expensive and they do not own a paraffin heater. They spend approximately R20 on IP per month since they buy five litres of IP at R10,00 twice per month. For lighting purposes they use IP in the rooms without electricity. They also buy two packets of candles per month. They have two light bulbs, one in a bedroom (60 watt) and one in the rondavel or thatched hut (100 watt). There is one light fitting outside but they do not use the light fitting because they fear it might be damaged by rain. Energy expenditure by the household amounts to approximately R35,00 per month: IP, R20,00 plus the electricity flat-rate of R8,50 prior to the increase plus an estimated R6,50 for candles. The grandmother estimated that they use electricity for lighting for approximately two hours per day. Electricity is only utilised for lighting purposes and although the household owns a radio, it had been broken for a long time. Electricity is therefore, only utilised for lighting purposes.

• Household 2

Household characteristics

The household consists of a grandmother (E) living with four of her grandchildren. The children are S aged 22 and in standard seven (male), T in standard four (male), O in standard 3 (female) and Y in standard 1 (female). The mother of the children does not stay with them and visits only once a year at Christmas. The grandmother experienced forced removals twice, first when she and her husband were "chased" from Marakeng by white farmers and secondly when they were chased by white farmers from the Downs area. Her husband used to own land at the Downs but when they came to Mafefe they did not ask for extra land apart from the house plot because they were "all mixed up". Household 2, therefore, also represents a "foreign" family with no access to extra land.

The grandmother is old and weak and cannot perform certain tasks such as planting and grinding of grain anymore. She is worried that when she dies there will be no one to look

after the grandchildren since her pension provides the only reliable cash income for the household.

Livelihood strategies

The only dependable income for the household is the grandmother's pension. The pension cheque is cashed by buying fruit from the market sellers on pension days but she is unaware how much they charge. Her daughter pays school fees of R35,00 for the eldest son and contributes food during her Christmas visits. The eldest son performs informal work for which he might earn up to R200,00 occasionally. His earnings are usually spent on necessities and he indicated that he might buy more lights when he has money again. They do not own any extra land and they had not planted the previous year. The eldest grandson has planted some fruit trees on the house plot and plans to plant on the house plot with the assistance of his younger brother. They own two bulls and a cow but no other livestock.

All necessities are bought from the grandmother's pension. Although she provides the only income for the family, the two boys decide what to buy at the end of the month and they do the shopping "because they are clever". Food expenditure amounts to approximately R150,00 per month. Other expenses include R70,00 per month towards the grandmother's burial society and R33,00 per year for the school fees of the younger children (R11,00 each). They never take credit but when they run out of money they borrow from relatives. They never borrow from neighbours as it "would not be right".

The buildings on the house plot consist of one single square room for the grandmother, a two-roomed rectangular building for the children next to a single room which serves as a sitting room. There is also a circular store room with a thatched roof. Next to the grandmother's room there is a lean-to used for cooking. Water is collected from a friend's place with a tap in the yard and all their washing is done in the river.

Energy use and expenditure

For cooking purposes they use wood exclusively which is collected by the two boys. They used to hire a bakkie to collect wood but they can no longer afford it. Before the electricity was installed, they used IP for lighting as well as candles. They used to buy four litres of paraffin per month at R9,60 and one packet of candles for R3,00. Now, they cannot afford to buy IP anymore and the result is that the grandmother does not have any form of light in her room since she is too scared to use a candle and the only light fitting is in the children's room/building. The grandmother, however, maintains that the electricity has improved their lives because "even on the street you can see at night". They would like to have more lights but they do not have enough money. Household 2 is an example where electrification clearly impacted negatively on the household, although it is perceived positively. Prior to electrification, the household could provide fuels for lighting purposes (IP and candles) for R12,60. This provided lighting for the whole household. After electrification and prior to the increase in the flat-rate they paid R9,30 to provide lighting in one room of the house. After the increase in the flat-rate to R15,00 the household will actually be paying R15,80 for one light bulb, or R3,20 more per month to provide half of the lighting service they were using prior to electrification.

• Household 3

Household characteristics

The household consists of a wife (aged 35 and completed standard five); her husband (41), the husband's mother (62) and a daughter in standard six. The interview was conducted with the wife since she is responsible for cooking as well as collecting and buying fuel. They were married in 1991 and the wife used to live in GaMasemola before moving to Mafefe after the marriage. The husband works in Vereeniging at a brick making firm and supports the family financially. The mother-in-law has been diagnosed with lung cancer from working in the asbestos mines. She has applied for a disability pension but has not received any compensation yet.

The house and the house plot is owned by the mother-in-law. On the plot there is a three-roomed square house of which one room serves as a kitchen. There is also a rondavel in

which the mother-in-law lives. There is no tap on the stand and she and her daughter collect water from the river. The mother-in-law also owns a small plot (20 feet by 10 feet) next to the river. She was unsure how the land was allocated.

Livelihood strategies

The husband sends back R500,00 per month from his salary. The mother-in-law receives an old age pension but she uses that to support her daughter who is staying in another village. She occasionally buys mealie meal but feels it is not necessary to contribute to the household since the husband is supporting them. The mother-in-law does, however, contribute produce that she grows on her plot next to the river. This includes mealies, onions, tomatoes, spinach and beetroot. She also grows and sells sugar cane but the income derived from the sales is not contributed to the household. The mother-in-law also owns livestock (five goats, five chickens, one cow and one donkey). The livestock are mainly for household consumption (goats and chickens) and a nephew looks after the cow and donkey. He ploughs for them using the donkeys and they sometimes give him vegetables in return. Although the grandmother does not contribute financially to the household, her contributions of food can be viewed as an important survival strategy for the household. By having one member in the household with access to land and the ability to produce food, the household's position is improved.

Energy consumption and expenditure

Cooking is mostly done on wood which is collected by the daughter-in-law approximately twice per week. They also use a paraffin flame stove for cooking and ironing, but only if there is no wood because IP is expensive. Prior to electrification they used IP for lighting. Now the paraffin lasts a lot longer and they only use it for lighting when the electricity fails.

The woman chose the 2.5A option because it was cheaper and they only use it for lighting. They have three light bulbs: one in the mother-in-law's rondavel; one in the lounge of the square house; and one outside. She would have liked to have a higher supply of electricity because she would like to use other appliances such as an iron, a hotplate and a kettle. This indicates a lack of adequate information dissemination since she should be able to use a hotplate with the limited supply.

Household 3 is an example of a relatively well-off family - they spend R8,00 per week on buying meat for example. The household is placed in a relatively better position since they can rely on a regular income in the form of the remittance from the husband and the mother-in-law contributes food which is grown on her land.

• Household 4

Household characteristics

The household consists of the respondent, one adult woman (27) and her child, a seven year old boy as well as three of the woman's sisters' children (a 18 or 19 year old girl in standard six, a 15 year old girl in standard seven and a fourteen year old boy in standard 5). The sister works in Pretoria and she supports her with R200 per month in return for looking after her children. She has three other sisters in the area who support her with small amounts of money from time to time. The woman was married for a short period but has separated from her husband. She has two other children who are not staying with her, A four year old girl who stays with her ex-husband and another girl who lives with the mother's sister in Driekop. Two of the woman's children died in infancy. The woman's mother died of lung diseases in March 1981. She worked in the asbestos mines in the area but she did not receive any compensation before or after her death.

The property used to belong to her parents before they passed away and she and her sisters inherited the plot jointly. A three-roomed house is currently under construction (paid for by her sister). They live in a zinc house divided into a bedroom and a kitchen by a curtain. There is no toilet on the property and she collects water from a tap nearby. She and her sisters also inherited extra land but this was damaged in the floods.

Livelihood strategies

The only regular income is the R200,00 remittance sent by the sister in Pretoria. The other three sisters occasionally give her R50,00 or R60,00 but this happens very seldom. She sews and knits table cloths but she does not sell anything. The household does not plant or cultivate any crops. The extra land was damaged in floods and nothing is grown on the house plot. They do not own any livestock. She very seldom asks for help or money from the neighbours as she is too shy. Occasionally she does borrow mealie meal but she is too shy to do it regularly although the neighbours have asked her why she doesn't ask for more help from them. She is aware of the CARE programme at the clinic but she was told that she is not poor enough to qualify. She does not understand this because they often go to bed hungry at home.

They buy 80 kg of mealie meal at R158 which lasts for two months. They buy groceries on credit from the shop but she is unsure how much they spend per month. They also buy IP and candles and she pays R2,00 per month to the ZCC church.

Energy consumption and expenditure

They use wood for cooking although they use IP occasionally as well. Wood is collected with the help of the young girls. Before having electricity, she used to buy two litres of IP per week (R16,00 per month) and the IP was mainly for lighting and, only when it rained, for cooking. She now only buys two litres of IP per month (R4,00) but she still buys candles in case of cuts in the electricity supply when they are working on the line. She feels that they are saving because they do not buy so much IP. They only have one light fitting in the zinc room although they plan on wiring the new house once it is completed.

Again, household 4 is an example of a household which can actually be spending more to satisfy their energy requirements after electrification if the planned increase of the flat-rate is taken into account. Before being electrified they spent R16,00 on IP and after electrification if the increase is considered they will be spending R19,00 (R15,00 flat-rate and R4,00 on IP). This does not include the cost of candles or batteries for their radio. The respondent was not very concerned about the planned increase in the flat-rate. This is probably because her sister pays for the electricity. However, the household is extremely poor and it seems that electricity is burdening them more than it is actually benefiting them - they are paying R15,00 per month for one light.

• Household 5

The household consists of three female adults and one child of six years old. The interview was conducted with G (33). She lives with her mother (60) and her younger sister (19) as well as her (G's) daughter (6). She has completed standard ten and would like to work but jobs are difficult to find. Her brother and sister work for Telkom in Boksburg and the brother sends home about R200 - R300 per month.

Livelihood strategies

The only regular income for the household is the R200 -R300 which the brother sends home. The mother keeps the money and gives them money for groceries. G occasionally sells fruit juice and ice blocks. She is unsure how much she earns from her sales per month but it is enough to buy more stock. They buy bread and sometimes pay for the electricity from the profits of the juice. If there is a surplus of money they buy tinned food and rice. The household has also benefited from once-off occurrences that provided an income - for example, the money received after selling three cows which were paid as lobola to the family as well as an income derived by G from working on a water project for a year.

They exchange mealies with the shop owner (80 kg plus R42,00 for a 80 kg bag of mealie meal). This is cheaper than buying mealie meal directly from the shop. Other expenses include R144 per year for two burial societies for the grandmother, school fees of R23,00 per year as well as transport costs (R18,60 for a single trip to Pietersburg) and energy expenses of around R20,00 per month.

There is a square house, a rondavel and two tin houses on the house plot. There is no tap in the yard and they fetch water from the butchery. They used to own three extra farming

plots but the one close to the river was washed away. The land was allocated to her parents by the chief and the plots will be inherited and owned by all the children after the mother's death. They grow mealies which they exchange for mealie meal and they use it to pay the people who assisted them with the harvest. They owned goats but they all died and they only own chickens at the moment.

Energy consumption and expenditure

They use mainly wood for cooking purposes. They normally hire a bakkie for R30,00 to fetch wood or they collect the wood themselves. For lighting they use electricity in the square house (the only building that they could afford to wire) but at times they use candles because they find the electric light too warm. They also use an electric iron which they bought from the Agency for R63,82. Other appliances owned by them include a radio and light set powered through a photovoltaic system bought by the brother in Johannesburg as well as a fridge powered through a petrol generator. The photovoltaic system is no longer operational. The generator was the property of G's sister and returned to her when she got married. The fridge is now being powered by electricity. G was well informed about which appliances could be used with the 2.5A supply. She was happy with the supply since she could afford it.

• Household 6

Household characteristics

The household consists of a mother (M) who lives with her daughter (G) and six of G's children. Her seventh child stays with an aunt. The ages of the children are not known but they are in the following standards at school:

- T, in standard 10, female
- D in standard 6, male
- Bt in standard 4, female
- Br in grade 2, male
- Bl not yet in school, female

A son (in standard two) of another daughter also stays with the family. The mother receives an old age pension and the daughter receives a disability pension from the asbestos mine where she used to work because "she is sick in the stomach". The interview was conducted with M.

Livelihood strategies

Both their pensions amount to R430,00 per month and the mother also assists her other daughters with about R200,00 per month. They therefore have the amount of R230,00 for their own use per month. They buy mealie meal for R180,00 per 80 kg bag as well as meat about every two weeks which they dry to make biltong. They spend approximately R50,00 on school fees per year and R200,00 on a burial society for both of them.

The house belongs to the mother. It was inherited from her mother and her daughter (G) will inherit it in turn. Water is collected from the river because they do not have any taps and two of the children have had bilharzia. They own a plot of land but it is far away from the river and they have not planted it because of lack of rain. The ground is also very stony and it is not fenced. They plant sorghum which they also harvest and grind themselves. There are also some fruit trees on the plot. The eldest daughter does most of the work (washes clothes, cleans the house and cooks on the paraffin stove) because "she does most jobs quickly". The son in standard six sometimes catches fish in the river which they dry for eating. They had recently bought two chickens for R20,00 each.

Energy consumption and expenditure

They use wood for cooking and boiling water. The wood is collected by M and G and because they are not strong, they only pick up wood, they do not collect it. For lighting they use electricity but because they only have two light fittings of which one bulb is broken, they also use IP and candles for lighting. They will only be able to replace the broken bulb when they can afford it. They also use their IP stove to heat their iron. The household therefore only uses electricity for lighting and they also pay for only one light

a month. They are so cash-strapped that they cannot replace a broken bulb of R4,00 immediately but they have to wait until they can afford it. It is therefore, arguable whether the household can afford electricity or benefit from it adequately.

• Household 7

Household characteristics

The household consists of M (33), her husband (F) and four children, a 13 year old boy, a nine year old girl (both in standard 2), a six year old boy and a 14 month old girl. M completed standard five but her husband has no schooling. The interview was conducted with M and, since her husband was away attending the ZCC church, he did not participate. The husband was retrenched from his job at a roadmaking firm in Tembisa in 1993 and since he has been unemployed he helps with the cleaning of the house, looking after the children and making the fire while she is away collecting firewood. They had to move to Mafefe from the Downs area because the whites wanted to farm there. They lost their house, land and six cows and a calf when they had to move. Both of them are currently unemployed.

Livelihood strategies

When the husband was retrenched he received R13 000,00 as a retrenchment package and they used the money to build their house but now there is nothing left of the money. He originally wanted to buy a taxi with the money but she convinced him that they needed a house to stay in. They are generally both involved with decision making. The house consist of three bedrooms and a kitchen but there is no water in the yard. The children fetch water from the river after school everyday and they have both had bilharzia.

They collect marogo (a type of wild spinach) which they dry and sell for R2,00 a cup. She was unsure how much they make from selling the marogo but they use the money for school fees. She works in other people's fields and is sometimes paid in cash or sugar cane and marogo. The husband only helps with their own harvest. They weave grass mats and sell them for R25,00 each. They have sold 13 mats since 1994 but this year the grass never dried because of the weather and they have not sold any. The husband was employed on the electrification project and at first he was paid R300,00 per fortnight and he gave her R150,00. It was then reduced to R150,00 and he gave her everything. They had no money for food and they had to borrow R50,00 from her father to buy mealie meal. Her grandfather also brings them mealie meal occasionally since he receives a pension. She borrows small items like sugar from neighbours and she returns it again but she does not normally borrow from them.

They do not own any extra land apart from their house plot since they are foreigners. They have not asked the chief for extra land although their parents owned land at the Downs. Someone allowed them to use part of a plot near the river but it was washed away in the floods. They planted fruit trees and vegetables on the borrowed land but they plan to plough and plant on the house plot in November/December. They own six head of cattle but they slaughtered the bull for food. They shared some of the meat with her father and family. They also own eight donkeys which they use for ploughing for themselves as well as other people.

Energy consumption and expenditure

Before the electricity was installed they used candles (1 packet @ R2,50 per month) and IP (4 litres @ R8,00 per month) for lighting. They collected wood for cooking and boiling water. They also own a paraffin stove which they used for cooking when it was raining. They have had no money to buy IP for more than a year now and she has not used the stove at all. After electrification they used electricity for lighting only as well as candles since the electricity supply was interrupted often when they were using it. They had to accept the 2.5A supply because they could not afford to pay the higher connection fees. They have six bulbs, one each in two of the three bedrooms, one in the dining room, kitchen, passage and outside. They ran out of cable before they could wire the third bedroom and they seldom use that room now.

The household was part of a consumer boycott organised in their village to protest against the increase in the electricity flat-rate. She indicated that they wanted a higher current and a card system because that would enable them to budget for electricity. Although the household seems wealthy because they live in a large house and they own livestock they are actually quite poor because they have no visible means of regular income. A card system would therefore, be more applicable since it would enable them to budget for changed circumstances.

• Household 8

Household characteristics

The household consists of a grandmother living with three of her granddaughters. The interview was conducted with the grandmother. She did not know the exact ages of the children but one is in standard one, one in grade one and the youngest is not yet going to school. The grandmother has two daughters. One daughter works in Johannesburg as a domestic servant and it is her children that are living with the grandmother. The other daughter lives in Muila village with her boyfriend. The grandmother has only completed grade one and can neither read nor write. The main source of income is her pension although her daughters contribute food and sometimes money.

On the house plot there is a house consisting of one square room with a zinc roof, one 2-roomed rectangular building with a zinc roof, and a brick built rondavel with thatch where the grandmother stays. The rondavel was built by the daughter working in Johannesburg and the grandmother vacates it when the daughter comes to visit. There is also a three-roomed house completed up to roof level which they are sharing the building expenses.

Livelihood strategies

The household's only income is the grandmother's pension. Her daughter contributes to the building expenses of the house and her other daughter contributed food and soap weekly since she was employed on the electrification project. The grandmother also owns a field in Kapa and they used to own one in Makorama. As she did not plant on it for three years because of the drought, the chief gave the land to someone else. She is too scared to ask for its return. She plans on planting mealies on the Kapa plot. She has not planted on the house plot previously because there was no fencing. She has recently bought fencing and will plant as soon as the fencing is erected. They own chickens and one rooster. The chickens are for their own consumption. She has credit at a shop which she uses to buy things like mealie meal and sugar. She never borrows from the neighbours because "it is not done".

Energy consumption and expenditure

She uses mostly wood for cooking but she also cooks on IP when it is raining and she uses the IP stove sometimes to boil water for tea in the morning. She collects wood herself and she buys from the woodsellers occasionally. They have the 2.5A supply but only one light bulb in the rondavel. The other buildings were not in a good condition so they did not want to electrify them. When the new house is complete, they will have lights in all the rooms. The daughter was given a fridge by her employers and they plan on using the fridge in the new house. For lighting in the other buildings they use IP (1 litre @ R2,00 lasts about ten days) and approximately one candle per month. Before they had the electricity they spent R8,00 per month on IP which was mostly used for lighting. Household 8 is also spending more on energy requirements after electrification. When the flat-rate increase comes into effect they will be spending more than R10,00 per month extra on energy for using one light bulb.

• Household 9

Household characteristics

The household consists of a husband (B), his wife and their daughter (in standard six). The interview was conducted with the husband since his wife is away during the week studying at the Academy of Learning in Pietersburg. He came to Mafefe with his parents

in 1973 and he was married in 1986. He owns and runs a shop from home and his daughter helps him during the week. All the family income is derived from the shop but they were vague about the amount.

Livelihood strategies

The shop provides their only income. They buy around R5000,00 stock (mainly beer and frozen chickens and other meat) per month. They estimate their household expenses at R350 per month and they spend R200,00 to R250,00 per month on electricity. He inherited the house from his father but he does not own any extra land nor is he interested in owning more land. He does not own any livestock and they do not plough or plant on the house plot although there are fruit trees for their own consumption.

Energy consumption and expenditure

They have conventional metered electricity and their total electricity bill is between R200 and R250 per month. They own three freezers, a hot plate an iron, a radio and six lights. They kept their paraffin lamps for emergencies and they also own a coal stove which they no longer use. Prior to electricity they used two LPG (liquefied petroleum gas) freezers which they have converted to electricity. They used two bottles of LPG per month (costing R80,00 each, i.e. R160,00). They also consumed 40 litres of IP per month (R80,00) and eight packets of candles at R2,00 a packet (R16,00). For cooking they used to buy wood for R60,00 which lasted about two months as well as coal for R5,00 per month. Their total energy bill therefore amounted to R281,00 per month. The household have therefore benefited from electrification since they are spending less to satisfy their energy needs and they are operating a third freezer. Access to electricity also increased their earning power since they now also sell ice which they could not do with the LPG-powered freezers.

• Household 10

Household characteristics

The household consists of a married woman (R, 43) living with three of her children (ages 18,12 and 10) as well as two of her grandchildren (5 and 3). Her husband is employed in Johannesburg as an office worker for the municipality. He supports the family and visits them monthly. The interview was conducted with R. She was born in Mafefe and her parents also lived in Mafefe. She is looking after her grandchildren because their mother was in Pretoria looking for work. The children help with fetching wood, they cook when they come back from school and they alternate with the washing.

R participates in the voluntary community groups like the Health Care group. Attempts to raise money for other projects failed and it is only the health project that is still continuing.

Livelihood strategies

Her husband sends back R500,00 per month. She decides what to buy with the money her husband sends her but she needs to consult him before buying expensive items or entering into hire purchase arrangements. He also consults with her before buying anything on hire purchase. He normally does the buying in Johannesburg. She grows fruit and vegetables in the yard which she sells if there is enough. They use the money to buy daily necessities. They spend approximately R221,00 on school fees per year which includes the fees for pre-school for the grandchildren. She contributes to a burial society (R35,00 per month) and she buys bricks to extend the house. She has spent R700,040 on 1500 bricks so far. She buys her groceries on credit from the shop which she pays monthly. Her credit is usually between R200,00 and R300,00.

She does not own any extra land besides the house plot but she has borrowed extra land in the past from someone with extra land. The land was about three times the size of the house plot and she harvested four bags of sorghum, two bags of green mealies and two bags of white mealies (1 bag=80 kg). On the house plot she grows vegetables for their own consumption as well as for selling. She does not own any livestock.

Energy consumption and expenditure

Before electrification they used IP and candles for lighting and wood for cooking. Since installing electricity they use that for lighting but also use candles when there is a power failure in the village. There has been three power failures since they installed the electricity in April. She still uses wood for cooking which she collects as often as she needs it. They opted for the conventional metered electricity supply because she wants to use more appliances in the future. At the moment she is only using the electricity for lighting and ironing and the electricity bill is about R45,00 to R50,00 per month. To install the electricity they paid R1200,00 to an electrician (this included labour and materials) as well as the R450,00 installation fee they paid to Eskom. She would prefer a card system because then they would know how much electricity they used and how to budget. Although she is happy with the electricity she thinks that they are spending more since she is still using wood for cooking.

• Household 11

Household characteristics

The household consists of a mother (S) living with her four children. The children's ages are nineteen (female), thirteen (female), nine (male) and six (male). The eldest daughter is improving her Standard ten results at Setotoluzune College while the second daughter is in standard five. The nine year old boy is in standard two and the youngest boy is in pre-school. The interview was conducted with the mother (S). Her husband is employed by SASKO in Pietersburg but he is an alcoholic and he normally lives in a hostel in Sheshego. She receives R200,00 - R300,00 from her husband at irregular intervals. She generates her own income from her hawking business and almost all decisions are made by S herself. She decided to purchase a fridge (R2745,00) on hire purchase for her selling business and she was building a new house for which she purchased all materials and made the bricks herself. She is active in women's groups but she is not aligned to either the Tribal Authority or the TLC.

Livelihood strategies

She earns approximately R800,00 per month from her selling activities and she receives support from her husband at irregular intervals. She pays the hire purchase instalment on the fridge every month and sometimes more if she can afford it. School fees are R22,00 per year and R10,00 per month for the pre-school. She decided to replace the tin house with a three-roomed brick house on the house plot. She made the cement blocks herself because it is much cheaper and her husband paid a builder to build the house (R2700,00). The new house is nearing completion. They have a tap on the stand.

She does not own any extra land but would not have time to plough it in any case because of her selling activities. She also cannot plant on the house plot since it is not fenced and she protects the small trees on the property by building brick walls of around one meter around them.

Energy consumption and expenditure

She opted for the 2.5A supply since she would not be able to afford the monthly payment of the conventional supply. She was informed about which appliances she could use since she attended workshops at the Tribal Authority before the electricity was installed. She uses electricity for lighting (she has two light bulbs at the moment but plans to install a third in the new house) and the fridge. For cooking she uses wood in the evening and IP in the morning for heating water. She also heats the iron on the IP stove. In this case, the impact of electrification can be viewed as positive since it enabled her to expand her selling business.

• Household 12

Household characteristics

The household consists of a mother (M, 53) living with five of her children and three of her daughter's children. Her children staying with her are a daughter (23), a son aged 21 and in standard 9, another son aged 18 and in standard six as well as a son aged 16 in

standard six and a daughter of 14 in standard five. The eldest daughter has three children which are also staying with them. She left school in standard six because of financial problems and would like to return but they cannot afford it. The 18 year old son was also forced to leave school because he was intimidated because they could not afford his school fees. They have no regular source of income and survive on money that the mother makes from making mud bricks and building mud houses, walls and laps for people. She is very poor but she does not qualify for a pension yet and she was told that she does not qualify for the support from Operation Hunger because it is only for orphans.

Livelihood strategies

She has no regular source of income. She earns money by making mud bricks, building houses, walls, floors and yards. For a long mud wall she gets paid R25,00 and for a yard she is paid R50,00. She collects the soil and dung for the floors herself otherwise she is paid too little. Her two sons help her to dig soil when she is employed to build a house or wall. She collects dung which she sells for 50 cents per 20 litre tin. The girls collect wood about three to four times per week, They collect wood for people who order it and they sell it for R10,00 per bundle. The wood collecting has paid for the 21 year old son's school fees. She does not own any extra land and she does not plant or plough on the house plot. They also do not own any livestock - "I have nothing, I am just a person of God". The eldest daughter would like to go to the urban areas to look for work but they do not have relatives with whom she could stay.

Her sister's son gave her cement and a door and window frame which she used to build a three roomed mud brick house. She cannot afford to put a roof on the house and she is scared that the house will be damaged in the rain. She borrows food from relatives and neighbours but she is tired of borrowing because it disturbs people. They sometimes go without soap for weeks but at least there is free medical care for the young children.

Energy consumption and expenditure

They use collected wood for cooking. They have the 2.5A supply but she has not paid the flat-rate for two months. She does not care if they cut off the electricity since they use it for lighting only. They are currently living in a two-roomed house and they have three light bulbs of which two are outside and one inside the house. They use candles in case the electricity is cut and they buy one packet of six at R3,50 and they use about four candles per month. She also owns a paraffin lamp and a three-legged pot with a hole in the side. They seal the hole with a lump of mealie meal so that they can still use the pot. She indicated that electricity is useless to her and that she thinks it is only for rich people.

• Household 13

Household characteristics

The interview was conducted with N (33) who stays with her mother-in-law (70), brother and sister-in-law and their three children aged 6, 3, and 2. N has two children of her own but they live in Johannesburg with her husband where they attend school. The daughter is 17 and in standard nine at boarding school and the son is 11 and in standard three at a private school. N is a primary school teacher in Mafefe and earns a net salary of R1726,53. Her husband is employed by an engineering firm but he does not send money back home because he is supporting the two children and paying their school fees. The mother-in-law supports two of her other sons living nearby with her pension but she sometimes contributes mealie meal to the household. The house plot belongs to her mother-in-law but she will inherit it when her mother-in-law dies. N would like to move out but her mother-in-law does not want her to move out since N's husband is the last born son and therefore has to look after his mother.

Livelihood strategies

N earns a good salary as a primary school teacher and her husband supports the children and pays for their school fees. Sometimes people borrow small items such as a cup of sugar or mealie meal from her but only family members would borrow money. She buys most of her groceries on credit which she settles at the end of each month. She also buys tinned food and other groceries in Pietersburg. She contributes R100,00 per month to a

burial society and she pays for her younger sister's tuition at Turfloop University. N has clothing accounts as well as hire purchase agreements. They pay R270,00 for an Old Mutual family insurance as well as two education investments for the children of R115,00 and R112,00 respectively.

They plant mealies, marogo and traditional beans on the house plot but they have a problem with water for the vegetables. N does not own any extra land but her mother-in-law owns a plot of land next to the dam. N does have access to the land but she does want to use it and the mother-in-law ploughs, plants and harvests herself. The only livestock they own are three goats which they use for own consumption.

Energy consumption and expenditure

She has 20A electricity for which she paid the R450,00 connection fee. She receives the electricity bills monthly but finds them extremely confusing and she would prefer a card system as it would be easier to budget and determine how much you use. Apart from her electricity consumption there is also a R34,82 basic charge or levy payable on the account. Her account over the previous five months averaged R68,60. She uses wood (collected or bought) for cooking foodstuffs that take a long time to cook, IP to save on electricity and only vegetables, pumpkin and marogo that cook very fast on the electric hotplate. The mother-in-law refuses to use electricity for either cooking or lighting and she believes that the food cooked on electricity would choke her or that she will be electrocuted when using the electricity. She buys five litres of IP per week at R2,25 per litre (R45,00 per month). When they buy wood it costs them R80,00 - R50,00 for the wood and R30,00 for the bakkie. For lighting they use the electricity and the mother-in-law uses a paraffin lamp.

• Household 14

Household characteristics

The interview was conducted with a shop owner who lives next to his shop which is located on the same stand. The shop is supplied with a 60A supply while he has 2.5A in his house. The shop was started in 1980. He is married and they have four children, two boys and two girls. His wife was away visiting the one daughter who had recently had a baby. The other daughter is studying at Turfloop University. The elder son is working for the man's brother, assisting him in a taxi business while the younger son is helping in the shop. The shop consists of one big room in front with a smaller storage room in the back. Next to the shop is a separate 2-roomed house where they stay. The shop will be jointly inherited by his sons.

Some of his produce like mealie meal and bread are delivered to the shop. He also sells IP. He buys two drums of 400 litres each and he sells it for R2,50 per litre. He and his wife also buy stock from Pietersburg. He estimates that he spends between R800,00 and R900,00 per week on stock while he earns about R1000,00. He extends credit for any purchase, even beer but the total amount of credit will depend on how much the person earns. When people lose their jobs he will carry their credit although he will not grant any further credit.

Livelihood strategies

The household income is entirely generated from the earnings of the shop. They do not have any extra land apart from the house plot. On the house plot they plant mealies and they have fruit trees for home consumption. He owns between 30 and 50 heads of cattle and his son looks after them. They also have ten goats and "lots of chickens".

Energy consumption and expenditure

He has a 60A supply in the shop which he only uses for lighting - two bulbs inside and two bulbs outside. His monthly electricity bill is about R60,00. He uses an IP freezer in the shop which consumes about 20 litres of IP per month but he is too scared to convert the fridge to electricity because it will be too expensive. He uses IP from the stock in the shop and he therefore uses it at cost price. He owns a radio which he uses in the shop. The radio is still running on batteries because he finds the electricity too expensive. He does, however, think that electricity helped his business because it enables him stay open later.

In the house next to shop they have the 2.5A supply which they use for lighting and their radio because "it doesn't cost more on the 2.5A". He was vague about the process of electrification and it seems that he did not have a choice for the electrification of the shop. He could use the same services in the shop on a 2.5A supply and he is currently paying R75,00 per month for six lights and playing a radio.

5.3 Household livelihood strategies

The section on household livelihood strategies is divided into two sections, namely household income and other livelihood strategies. This is not an attempt to argue that monetary income represents the most important aspect of a household's survival strategy but rather an attempt to provide a framework for organising the discussion on livelihood strategies.

Household survival strategies in the study sample include access to regular sources of income (pensions, remittances, profits generated from selling activities), occasional sources of income (gifts from family members or occasional but not regular, i.e. dependable support from family members) as well as the sale of small items (grass mats, marogo) and labour. The sale of small items and labour are distinguished from other selling activities because it does not take place on a regular basis and the income generated is therefore not reliable. Other important survival strategies include borrowing from family and neighbours and access to credit at the local shops.

Lastly, it should be noted that household livelihood strategies are not only influenced by "physical" issues such as access to land, access to reliable income, family size, etc. but also by perceptions and attitudes. For example, household 4 indicated that as a woman she is unable to do "hard labour" and that men are stronger than woman. Gender perceptions of what type of work woman can do effectively excluded her from participating in development projects where she could have earned an income such as the electrification project. The female head of household 11 explained that she was very poor because she had no sons to provide for her - "sons should provide for a family". Household 11 is also an example of how gender relations influence household livelihood strategies. Although the woman believed that sons should look after the family, the daughters of the household collect firewood and sell it. The money earned through selling of the wood was exclusively used for paying the son's school fees. Therefore, not only was the household not supported by sons but by its daughters, the unrecognised contributions of the daughters' labour was used exclusively for the benefit of a male (21 year old son).

5.3.1 Household income

Households in the study sample had various sources of income but the most important ones were old age pensions and remittances from family members working in urban areas. From the sample of fourteen households, eight households were reliant on pensions and remittances and seven of these households were headed by females. Old age pensions ranged between R300,00 and R450,00 and are often the only secure form of income for a household. Pensions also support family members like daughters and sons not living with the household. This is often the case when there is another source of income for the household in which the pensioner lives and households 6 and 13 are examples of this. When a pensioner uses her pension to support another child, contributions to the household where the pensioner is living may take the form of mealie meal or other necessities. Members of four out of the fourteen households interviewed received an old age pension as their only income (households 1,2,6 and 8) and four pensions were directly supporting a total of 21 individuals in the four households.

Two households were supported monthly by husbands with R500,00 per month. In the case of remittances, it is important to note that not only husbands support households but also other family members, for example, sisters, brothers and uncles. Household 4 was supported monthly by a sister but also occasionally by the other three sisters with R50,00 to R60,00. Financial support from family members occur monthly as well as intermittently. Apart from two households (7 and 12) who had no regular source of income, the households reliant on pensions as their main source of income were generally poorer than households receiving remittances from husbands in the sample, for example. They were, however, better off than the households receiving remittances from other

family members (households 4 and 5). It can therefore be argued that female-headed households reliant on remittances from family members other than husbands represent poorer sections of the community and tend to be even more marginalised than female-headed households relying on pensions.

Contributions to the household by family members not living in the same house can also take the form of food, cement, door and window frames for extending or building a house, soap and mealie meal as well as money and gifts of food at Christmas time.

The impact of asbestos mining in the Mafefe area can clearly be seen on the households in the study where four households had someone either currently ill or already dead from the disease. Household 1 also indicated that the father died in a mining accident. One member of household 6 was receiving a disability pension or waiting to receive one. The disability pension seems to be in the vicinity of R200,00 - R300,00 per month. The fact that only one household out of four affected is receiving a disability pension indicates the powerlessness of rural communities and individuals to access sources of compensation.

Other sources of income for households in the study included collecting and selling firewood (household 12), collecting and selling marogo (household 7), building mud houses, walls and lapas, assisting with building of regular houses, collecting soil and dung for the making of mud bricks, making mud bricks, collecting and selling dung for smearing on outside floors (household 12) selling surplus fruit and vegetables (household 10), selling sugar cane (household 3) as well as weaving and selling straw mats (household 7). Income generated from agricultural activities is discussed in greater detail in section 5.3.3.

Only one respondent was formally employed in Mafefe as a teacher at a primary school (household 13). This reflects the lack of employment opportunities in rural areas in general and Mafefe specifically. Respondents also indicated that they would like to be employed or have a job but that would mean they would have to move to urban areas. The perception that employment can easily be found in urban areas definitely exists. The presence of a family member in an urban area can assist in helping someone to seek employment there and can therefore also be regarded as an important tool for a household's livelihood possibilities.

People were also temporarily employed by the electricity project, the water project as well as the clinic building project and income was derived from this form of employment. Household 7 also had access to the retrenchment package of the husband which they used to build their house.

Three households interviewed generated their household income from operating shops or general selling/hawking activities. Households 9 and 14 operated formal shops and generated substantial income from these. They also used stock like IP from the shop for household consumption (14) which resulted in savings to the household. The woman of Household 11 operated a hawking business and also generated a substantial income when compared to households reliant on pensions. None of these households owned any extra land although household 14 planted mealies on the house plot. They indicated that they were not interested in extra land since they would not have time to plant and harvest. It can therefore be argued that agricultural activities diminish in importance as a source of household income or as a household survival strategy when the household is earning relatively more than the average income for rural households.

5.3.2 Other survival strategies

A very important means of survival for most households is their access to credit at local shops. Shop owners seemed very flexible about extending credit and repayment. All the respondents indicated that the households determined the amount of credit and not the shop owners. Apart from credit at local shops, people make use of lay-by schemes in larger towns such as Pietersburg. In both cases of credit, repayments are made regularly. Only one household (13) made use of accounts at popular stores such as Edgars, Foschini and OK Bazaar. This was also the only household with a member formally employed in Mafefe. It can therefore be argued that households without access to regular monthly incomes are further marginalised and excluded from accessing formal avenues of credit schemes such as accounts and hire purchase agreements.

In the case where the household is reliant on insecure and infrequent forms of income and cannot access more credit from local shops, they often have to resort to borrowing money as well as food and other household items. Borrowing is regarded as shameful and most respondents would be in dire need before they borrow. One respondent said that she waits until after dark before she goes out to borrow something because she does not want the neighbours to know. People borrow from family members as well as neighbours and money is borrowed rather than other household items. However, one respondent indicated that she would never borrow from neighbours: "it would not be right". Mealie meal and sugar are, however, often borrowed. Smaller amounts of food such as a cup of sugar was not seen as borrowing but rather helping people who ran out after the shops closed. The amount of the commodity borrowed, therefore, also seems to have an impact on the willingness of the lender to oblige. People stressed the fact that they always returned the exact amount borrowed, be it money or mealie meal. One household indicated that they had borrowed money to pay the electricity flat rate but no other cases of borrowing fuels such as paraffin was found as "it is not cultural".

Social networks enable people to access support in special circumstances such as funerals and weddings. Neighbours, friends and family contribute in the form of food, cooking pots, labour as well as firewood and no repayment is expected. In the case where a household's access to social networks is limited - as in the case of foreigners or people not from Mafefe - the possibility exists that the household would not be in such a good position as, for example, a household with accessible family structures.

Another very important contribution to the livelihoods of rural families is the contribution of family members, relatives or neighbours to the household in "kind". No tangible product is contributed but rather a service or a chore performed that enables the household to get by. Examples of contributions in kind range from the husband who pays the school fees and supports the children in Johannesburg while they are at school (household 13) to the relative who washes the grandmother's clothes once a week (household 2) and children not living with the household helping by providing labour to build the family house. In the case of household 12 the children contributed by assisting the mother to dig mud for the making of the clay bricks that she sells. Most important in this category are the contributions of women and children to the well-being of the household by performing tasks such as the collection of wood, fetching of water, washing clothes and cooking food. Contributions such as these are largely overlooked because they are not seen in monetary terms. Without these contributions, few rural households would survive.

5.3.3 Livelihoods and agriculture

The ability of households to derive an income from agricultural activities is closely linked to their access to land. Land in Mafefe can be categorised into two types, namely, the land on which the house is built or the house plot as well as a separate piece of land or plot, normally away from the house near the river. People cultivate both pieces of land if circumstances allow. Usually animals and livestock are kept on the house plot while the other plot is planted with grains and/or vegetables. Grains and/or vegetables are, however, also planted on the house plot.

Methods of land acquisition as found from the study sample of fourteen households can be described as follows:

1. *Allocation by the Kgoshi*

Allocation of land by the Kgoshi can be divided into land allocated a long time ago as well as land newly allocated to a person applying to the Tribal Authority. The Kgoshi allocated land in the past to applicants, especially house plots to newcomers (also called foreigners and discussed in greater detail below) in Mafefe. Foreigners were rarely allocated extra land, either because they did not ask for it or because all land was already allocated. Should someone wish to apply for land now, an application can be made to the Tribal Authority. Anybody, including women can apply. However, women need an uncle or older male to speak on their behalf and put their application to the Tribal Authority. Once the application has been granted, the person is the legal owner of the land and they can rent it or lend it or cultivate it themselves. A change of ownership needs to be approved by the Kgoshi, however.

2. Inheritance from parents or relatives

There used to be restrictions on the inheritance of land since the only person who could inherit land was the youngest son of a family. The restriction seems no longer applicable and anybody, including daughters can now inherit land. One respondent subscribed the changed tradition to the presence of a lot of unmarried women in Mafefe. It could be a question of having no sons to inherit the land or because of pressure from daughters to also inherit. Households indicated that land can be jointly inherited by all the children in the family or shared by a brother and sister or two sisters.

3. Renting of land from owners

If a household knows about a landowner with excess land and if they have enough money or commodities to pay for the land, they could rent the land and cultivate it. Rent agreements seem to be short-term (typically one growing season) and need to be negotiated again for the new season.

4. Borrowing land from owners

A land owner with excess land can also allow a household to utilise the land at no cost. These agreements also need to be re-negotiated.

The Kgoshi claimed that land cannot be lost once it has been allocated. Household 8, however, claimed that they had lost land which was not planted for three years because of draught. The Kgoshi re-allocated the land to someone else. Since the Kgoshi gave the land away, they are too scared to ask for its return. It is further interesting to note that household 8 is headed by a female pensioner who is illiterate. The loss of the household's extra piece of land may indicate the powerlessness of marginalised women in the community. Since women can own land and inherit it, the system of land acquisition seems equitable in terms of access for women at face value. However, if a woman wishes to apply for land and she does not have a male relative to speak on her behalf, her access to land may be restricted.

Access to land also seems restricted to foreigners, or people not born in Mafefe. The position of a "foreigner" can be caused by the following:

- People were forcibly removed from the Downs and Marakeng areas of Mafefe. The Downs area was under the jurisdiction of the Kgoshi of Mafefe. Many people who were removed from the Downs moved to Mafefe and the Kgoshi granted them land. They were only granted land to live on (house plots). It seems that people were afraid to ask for more land or unsure if they could get more.
- People moved to Mafefe for various reasons such as work, marriage, magic, etc. If a person moves to Mafefe a "trek-pas" is required from the person's former chief. The Kgoshi in Mafefe can then grant permission to occupy land in Mafefe. After the permission to occupy has been issued, the person is allowed to stay in Mafefe.
- Women who married someone from Mafefe also regard themselves as foreigners.

The concept of "foreigner" is applied to different people in different circumstances and limits access to resources and therefore impacts on livelihoods. Even though the concept of "foreigner" is not clearly formalised in the society structures, people's perception of being a foreigner impacts on their ability to access resources in the community.

The ownership of or access to land contributes to livelihoods of households in Mafefe in the following ways:

- It enables people to keep livestock for own consumption.
- It enables people to raise livestock or look after livestock in return for payment.
- People can plant grains for own consumption.
- Grains can be planted for animal feed and feed does not need to be bought.
- People can pay other people for work done in the form of grains.
- People can pay other people for work done in the form of livestock.
- It enables them to plant vegetables for own consumption.
- Vegetables can be planted to be sold.

- Fruit trees can be planted or cultivated for own consumption.
- Seed are kept back for re-planting and seed therefore does not have to be bought.
- Livestock (donkeys) can be lent to people who in return plough the owners of the donkeys' fields for free.

It is therefore clear that access to or ownership of land exercises a wide range of impacts on the livelihoods of households. Households without excess land were poorer than households that could produce for themselves and for replanting and animal feed purposes. Households 1, 2 and 7, for example, had no extra land because they were foreigners. Household 7 and household 12 can be argued to represent two of the poorer households in the study and neither had access to land or cultivated any crops.

Agricultural activities also contribute to networks and strengthening community ties. Examples are:

- People borrow donkeys for ploughing and borrowers plough lenders' lands for free.
- Family members participate in activities, for example, children help to plough and plant and look after cattle. The family works together and every contribution is important.
- Slaughtered livestock like cattle are shared with family, friends and neighbours.
- Livestock plays an important role in celebrations as when a family member is home from the city or the slaughtering of cattle for a funeral.

Specific issues therefore, influence agricultural activity and therefore, the livelihood strategies of people in Mafefe. Often these issues are beyond the control of the people, and they include:

- Lack of extra land or suitable land.
- Lack of water as well as the lack of rain.
- Lack of manpower/female power.
- The floods of 1995 washed land away and destroyed people's land.
- The stony ground makes ploughing very difficult.
- There is a lack of fences and people use bushes to mark their property. Without fences goats can destroy the crops.
- People do not own donkeys and when they need to plant they need to hire donkeys.
- People do not have seed. They might not be able to afford to buy seed or the harvest was poor and they could not keep any seed back.

People also choose not to engage in agricultural activities because they are not interested or they do not have the time. This was especially true for respondents engaged in selling activities.

5.4 The impact of electrification on household livelihood strategies in Mafefe

The impact of electrification on household livelihoods can be argued as being minimal to non-existent. In fact, there are cases where it can be argued that electrification exerted a negative impact on household livelihood strategies since households are paying more per month to acquire either the same or even less energy sources to satisfy their energy needs. Two cases of a positive impact of electricity on household livelihoods can, however, be observed in the cases of households 9 and 11. The impact of electrification on all households in the study sample is discussed in greater detail in section 6.4. An overview of the impact of electricity on household livelihoods will be presented below.

Access to electricity had no impact on agricultural activities of any of the households in the study since no household utilised electricity for agricultural purposes such as water pumping, milling or other agricultural activities. The use of electricity was mainly limited to lighting with limited exceptions in terms of cooking and refrigeration. It can also be

argued that the level of supply, i.e. the 2.5A supply did not place a specific restriction on households' ability to utilise electricity for agricultural purposes since even households with access to conventional metered electricity did not use electricity for agricultural purposes.

Two households (9 and 11) reported a positive impact of electricity on their household incomes and livelihoods. In the case of household 9, the household income was derived from the shop operated by the male head of the household. He converted two LPG fridges to electricity and bought an extra electric fridge. The electricity bill is between R200 and R250 per month where he previously spent between R290 - R300. Not only is he saving money but he indicated that he could also increase his income because he can sell ice which he could not do with the LPG freezers. Household 9 has access to conventional metered electricity as opposed to household 11 which has access to the load limited supply. Household 11 also clearly benefited from access to electricity since the woman bought a fridge and she sells items such as fruit juice, ice blocks and cold meats in the community. It can be argued that household 11 represents a case where adequate access to information regarding the 2.5A supply enabled the household to make full use of electricity. Household income was directly affected by access to electricity and the woman was able to increase household income through her selling activities. It must also, however, be noted that she seemed to be a very enterprising individual and that the personality and drive of individuals to maximise external benefits cannot be overlooked.

Households which were negatively affected by electrification will be discussed in section 6.4 below.

5.5 Social relations of power

At face value, it seemed that women play an important role in community as well as household decision making. According to one respondent, the current Kgoshi's aunt was the acting chief until her death. After her death a woman from Sekukhune was appointed as chief but she died in a motorcar accident. The present Kgoshi was appointed after her death. One of the indunas in Mafefe is a woman and there is also a female member of the TLC. Women participate actively in the various development committees and it was also indicated that women are part of the tribal decision making process despite resistance from "old men". Women can own and inherit land and which is unusual in comparison to other rural areas.

Women also seem to have decision-making powers within a household, for example, in household 7 where the woman resisted the purchase of a taxi with the husband's retrenchment money and insisted on the building of a house. Household power relations seem to be formed around the person earning the money or supporting the household. If it is a case of a pensioner supporting the household, indications are that she would control the money and decide what to buy for the household. In the case where another family member was supporting the family and paying for the electricity, it was indicated that she would decide on the type of reticulation for the new house. An electric light was placed in her bedroom (rondavel) which is vacated when she visits. Respondents indicated that they would need to consult the supporting household member when making decisions on hire purchase agreements. The process of consultation took place when the supporting household member wanted to buy something on hire purchase.

Community power relations seem to revolve around the relationship between the Tribal Authority and the Kgoshi on the one hand and the TLC and the Community Centre on the other. Clashes seem to focus on the issue of development within the community with both sides wanting to be responsible for development. Initially the relationship was one of co-operation but after the local elections the situation deteriorated to the extent that the Kgoshi tried to evict the Community Centre from its premises and get the local councillors fired from the TLC. The impact of the clashes between the traditional and newly-elected structures in Mafefe can be seen in the ways in which certain households were informed about the electrification process in general and the Electricity Agency specifically. Households supporting the traditional structures seemed marginally better informed than households supporting the TLC. The power clashes are further impacting negatively on the community since development projects are hampered or stopped due to

the problem. Although the situation could be addressed through mediation, despite a positive declaration of intent from the TLC, nothing has materialised.

Agricultural activities and power relations are closely linked in the sense that women are mostly responsible for planting and/or deciding when to plant. It can also be argued that power relations within a household produce the gender division of labour in households. A husband whose wife died admitted that he did not know when to plant since it was his wife's domain. He therefore did not plant anything. The knowledge of women and their agricultural activities are, however, not regarded as special or contributing to the livelihood of the family. The observation was made that it is the duty of men to support a family. Women are therefore not acknowledged for their important contribution.

In the case of mothers-in-law, ownership of land impacts on household power relations. In one case the mother-in-law owns the house plot and other plot. When the produce is sold the money goes to mother. Vegetables, however, are consumed by the household. One family looked after other people's pigs. Although it is the daughter who looks after the pigs, the mother is paid with a piglet. According to the households interviewed, the daughter does not normally interfere with her mother-in-law's agricultural activities and does not help. Most planting and harvesting are done by the women, although sometimes someone will help with ploughing or harvesting.

In terms of community power relations, the poorest families who are the most vulnerable had no extra land beside their house plots, and did not plant anything on the house plot. They also owned very little or no livestock. Examples are households 2, 4, 7 and 12. It is further interesting to note that three of the households are female-headed households.

People were also manipulated to gain political power through the utilisation of land agricultural issues. People were promised fences for a new block of land by the river. This happened just before the elections in January.

6. An overview of household energy use patterns in Mafefe

6.1 Introduction

Households in Mafefe display the characteristics of typical rural energy use patterns. These energy use patterns are characterised by multiple fuel use with a dependency on firewood for end uses such as cooking, water heating and space heating and the use of commercial fuels such as illuminating paraffin (IP), liquefied petroleum gas (LPG) and electricity to a lesser extent. Energy use patterns are closely influenced by household income which are often unpredictable and unreliable or just very limited. Other influences include the structure of the house, household size, composition and headship (male or female), ownership of appliances and climatic conditions to name but a few.

6.2 Energy use and expenditure

6.2.1 Energy sources

All households made use of woodfuel for cooking purposes. Wood is mainly collected but some households reported buying wood per headload at the cost of approximately R20,00 as well as hiring a bakkie to collect wood. A bakkie load cost R80,00 (R50,00 paid to women who collect the wood and R30,00 for the hiring of the bakkie) and would last about six weeks. Illuminating paraffin is also used for cooking purposes although to a lesser extent than wood. IP is mainly used when people have run out of wood, when it rains and in the case of household 13, "to save electricity". The observation can be made that the availability of electricity has not displaced any fuel, specifically pertaining to low income households. Households still reported buying a packet of candles or one candle as well as IP "for when the electricity is shut down". No household reported selling or giving their IP lanterns or lamps away. This also supports the argument that electricity did not replace the use of IP or candles. Due to the limited number of lights available in a single house (ranging from one to three), there are still rooms without lights and people make use of IP or candles in those rooms for lighting. In the case of household 13 the use of IP for lighting instead of electricity is a conscious choice, since the grandmother is scared of electricity and will not use it for cooking either.

The impact of electricity can be best assessed in relation to the use of IP. The availability of electricity did not displace the use of IP but rather seems to have broadened the end-use application of IP. Households reported that before having access to electricity, they only used IP for lighting and seldom for cooking. After electrification they now mostly use IP for cooking and only occasionally for lighting purposes. Electricity, therefore, seemed to have "freed" IP for more applications than just lighting. IP, therefore, contributed towards convenience in the house because people could now also cook when it rained or when the wood was finished or just heat water quickly for tea in the morning. Despite this occurrence, most households reported a drop in IP expenditure and frequency of purchase. Households are not necessarily buying more IP, they are actually buying less but they are using it for different end-uses. Household 2 reported that they had stopped buying IP because it was too expensive. The grandmother of the house now has no lighting as she has no light bulb in her room.

Another interesting aspect is that IP seems to influence the electricity consumption patterns of the more affluent houses. In the case of household 13, the woman (a primary school teacher) has reverted back to IP because cooking with electricity is too expensive. She has a conventional electricity supply and her bill therefore reflects her consumption. She cooks food that does not take a long time to prepare on her electric hotplate but prefers to use wood and IP because it is cheaper. In the case of household 13, electricity became another fuel available within the range of fuels utilised by households. The choice of which fuel to use for which end-use is a complex decision and takes aspects such as cost of the fuel, convenience, household income and end-use in consideration.

Wood is used for heating water and space heating purposes, although small amounts of water are heated using IP. Not all households reported on space heating requirements but those who did made use of wood. Ironing is done by utilising a coal iron (wood), heating

an iron on a primus stove (IP) as well as electricity. Household 5 reported having used a PV system for lighting and powering a radio. The system belonged to the brother who took it back. Fuel sources used for refrigeration purposes are electricity (using both the 2.5A supply as well as conventional reticulation), LPG and IP. In the case of the IP fridge, the shop owner wanted to save electricity as he suspects that it would be more expensive to run the fridge on electricity. The shop is conventionally metered and the shop owner makes use of IP from his stock. He therefore uses IP at cost prices. Household 13 also reported using a generator to enable them to use a refrigerator. Running the generator was very expensive though, and the generator was given back to the brother. Household 9, who also runs a shop, reported using gas for refrigeration before electrification. The freezers were converted to electricity and the shop owner can now sell ice blocks.

Only a few households mentioned owning a radio or a television set. Energy needs for entertainment purposes are mostly satisfied through battery powered radios. None owned a television set. Household 13 could also have utilised the PV panels for powering a radio but it was not entirely clear if they had used it in such a manner.

6.2.2 Appliances

Various important issues surrounding appliance ownership need to be taken into account. Household appliances can be divided into four main categories, namely appliances that are owned by the household and used; appliances that are owned but not used; appliances that are not owned but used (borrowed) and appliances that the household plan on buying.

Households in the study owned various appliances and a summary of household appliance ownership is provided in table 3. Households 3 and 10 indicated that they would purchase appliances if they had access to a higher electricity supply. Household 3 indicated that they would like to use an iron, hot plate and kettle and expressed clear dissatisfaction about the lack of information about the load-limited supply. Household 10 chose the option of a conventional electricity supply to enable them to utilise more appliances in future. Currently the only electric appliance in use is an iron.

Table 3: Household appliances

<i>H' hold</i>	<i>Appliances owned and used</i>	<i>Appliances owned but not used</i>	<i>Borrowed appliances</i>	<i>Apps to be bought in future</i>
1	Primus stove, charcoal iron	Radio (broken)	-	light bulb (not affordable now)
2	2 x 3-legged pots, 1 frying pan	-	-	-
3	IP flame stove, IP lamps	-	-	-
4	IP 2 flame stoves, coal iron, 2 IP lamps, radio (battery operated)	1 IP lamp (broken), TV (battery stolen)	-	-
5	Iron (bought from EA),	-	Fridge (returned) PV radio and lights (returned)	-
6	IP stove, 2 IP lamps	-	-	-
7	2 IP lamps, set of aluminium pots, radio (battery operated)	IP stove (IP unaffordable) radio (broken)	-	-
8	IP stove, IP lamps, radio (battery)	Fridge (will connect to electricity in new house)	-	-
9 (& shop)	3 freezers (electricity), hot plate, iron, radio	-	-	-
10	Iron	-	-	Wants to buy more
11	Fridge, IP stove, cast-iron iron, ash iron	Radio (broken)	-	-
12	IP lamp, 1 x 3 legged pot	-	-	-
13	2 plate hot plate, 1 toaster, kettle, steam iron, IP stove, IP lamps, 3 x 3-legged pots			

6.2.3 Energy expenditure

The price of IP varied between R2,20 and R2,50 per litre, but was slightly cheaper in bulk and prices ranged from R2,00 to R2,20 if bought in five litre quantities. Candles reportedly cost about 80c for one and R2,50 per packet. Wood was mostly collected but also bought in head loads and bakkie loads. No incidence of current LPG use was found and only one family reported using batteries but were not sure how much they cost. Most houses mentioned that "they are saving" because of electricity. Household 4 reported buying two litres of IP per week at R16,00 per month before electrification. They now buy two litres of IP per month. Household 8 also mentioned they "use less IP and candles" Instead of using four litres of IP per week, they now use two litres approximately every ten days. It is doubtful if households actually achieved a saving in their energy expenditure. Although they buy less IP, the expenditure on electricity came very close to that of IP and households still report buying IP although in smaller quantities. As the flat rate may be increased to R15,00, households could be paying the same as before electrification or even more.

6.3 Electricity use and expenditure

Electricity was exclusively utilised for lighting purposes by eight of the fourteen sample households (households, 1, 2, 3, 4, 6, 7, 8, and 12). Household 2, 4, 6 and 8 had only one light bulb in use. Reasons for using one light bulb varied between households, from the installation of only one light fitting, to being unable to replace broken light bulbs. Four households out of fourteen therefore had extremely limited use of electricity because they used it for lighting purposes alone and only had access to one light bulb. It can, therefore, be argued that the impact of electricity on these households was minimal.

Electricity was also used for ironing by households 5, 10 and 13. Only household 5 had purchased their iron from the EA. Four households (5, 9, 11 and 13) used electricity for refrigeration while household 8 also owned a fridge but they were not yet using it. Only households 9 and 13 were utilising electricity for cooking purposes. Households 9 and 13 also represent higher income households and were noticeably more affluent than the rest of the study sample. These households also had access to conventional metered electricity. Although it is clear that electricity is utilised to a limited extent by most households in the study, it cannot, however, be argued that the 2.5A supply is responsible for the low levels of electricity use, since even households with access to conventional metered electricity did not seem to fully utilise its potential.

Electricity use and expenditure varied amongst the households in the sample. Out of the fourteen households interviewed, four cases (households 9 which is running a shop from home, households 10 and 13 and the shop owned by household 14) were using conventionally metered electricity. In the case of household 9, the conventional metered electricity was specifically chosen because of the business, while household 10 chose conventional metered electricity to be able to use appliances in future. The respondent of household 9 was the husband since his wife studies in Pietersburg during the weekend. He indicated that before electrification, he spent between R290 and R300 on LPG for two freezers. They now own three freezers, a hotplate, an iron, a radio and six lights and the electricity bill ranges between R200 and R250 per month. In the case of household 9, savings were effected on the energy expenditure through access to electrification.

Household 10 paid the R450,00 installation fee and claims to have paid someone R1200,00 to do the wiring of the house. There are only two lights, one inside the house and one outside. She indicated that she did not get the 2.5A supply because "she wants appliances in the future". She is therefore paying around R45,00 per month for the use of two lights which she could have also used with the 2,5 A supply. This points to a lack of information since she was under the impression that no other appliances except lighting could be used with the limited supply system. Expenditure on electricity includes the flat-rate, and the costs of the initial purchase of bulbs, fittings and lampshades from the TA/EA. Some households indicated that they received the three-core from Eskom but it is probable that they paid for them. This results from the misunderstandings created by the confusion of the TA, the Electricity Agency and the Kgoshi. When householders paid a R10 connection fee, they were given two light bulbs, a length of three core and a plastic lampshade. Most people thought they were buying this equipment from the Kgoshi, while others thought it

came from the Tribal Authority, or from the Agency or that they had bought it from Eskom. Bulbs do not seem to last very long, with one household reportedly replacing one bulb at least ten times. Bulbs cost R4,00 to replace and household 6 who have only two lights cannot afford to replace one of the broken light bulbs. The lampshade was also not of very good quality and one household said that it melted from the heat of the bulb.

Various households expressed the value that they place on electricity or the extent to which they did not value it at all. Household 1 indicated that they had borrowed money to pay the electricity flat rate but that they normally pay right after receipt of the household income (pension). This can be viewed as an expression of the value that the household place on electricity as well as the order of priority in terms of household expenses. Household 2 indicated the value they place on electricity by mentioning that even though the son only earns an occasional income, "he might buy more lights next time he has money available". Although it can be argued that households derive a limited benefit from electricity, some households value it nevertheless. Households also expressed negative views about electricity. Household 8, for example, would have asked for water if they had been given a choice and household 12, who said that "electricity is only for rich people".

6.4 Impact of electrification

The cases of a noticeable positive impact on the lives and livelihoods of the households include household 9 and 11. In the case of household 9, access to electricity had a positive impact on their lives and their business. They are noticeably saving on IP and LPG, and they have bought an extra freezer and have increased their earnings because they are able to sell ice blocks which they could not do before they had electricity. In this case, an already affluent family managed to earn more money because of electrification. In the case of household 11, access to electricity improved the situation of the household in general and the woman in the household specifically. Before electrification she was dependent on the irregular support of an alcoholic husband. After electrification she was able to establish a hawking business by purchasing a freezer to enable her to sell frozen fruit juice and other foodstuffs such as meat and polony. She now earns around R800 per month and this improvement in her position was made possible through access to electricity. The impact of electricity can also be described as positive in the cases of households 1, 3, 10 and 13. In the cases of household 1 and 3, access to electricity broadened the household's application of IP and extended the range of uses of IP in the households. Both households indicated that they also cook on IP since they are not only using IP for lighting purposes.

The impact of electricity seemed limited on most of the households as well as on the shop owner (household 14). In the cases of households 2 and 12 electrification even seemed to have a negative impact. Both households are extremely poor. Household 2 bought IP for lighting before electrification but since then could not afford IP anymore. The result is that since the household has only one light bulb, the grandmother has to go without lighting since she formerly used IP for lighting. Household 4 would also pay more for their energy needs once the planned increase in the flat-rate is effected. Despite this, they did not view electricity negatively. Household 8 was in a similar position since they would be spending R10,00 per month more for using only one light bulb. Again, despite this, they perceived electricity positively: "Their lives improved since the children can study at night". Household 12 could not afford the flat rate payment and did not pay for two months. The respondent indicated that "it is of no significance to her if she is cut off as it is only used for lighting" and she felt that electricity was useless to her because it was only for rich people. The method of electrification can also be questioned since that particular household lives in a two-roomed house but two lights were placed outside and only one inside the house. The reason for the decision to place two lights outside a two-roomed house is still unclear. Since most people still utilised wood for cooking purposes, having access to electricity for lighting does not seem to be essential to their survival as opposed to having access to adequate fuel for cooking purposes.

The lack of information impacted negatively on most households. They were not aware about which appliances could be used, or about the increase of the flat-rate. According to the Kgoshi, it was explained at the workshop that the flat-rate would be increased after

six months because it was a pilot study and R8,50 is less than the normal flat-rate paid by rural households. No household in study was, however, aware of this fact. The lack of information about electricity in general also caused one household not use their outside light fitting "because it would break in the rain". It therefore, impacted on the utility that they can derive from the electricity.

Households own very few electrical appliances and it can therefore be concluded that electricity is mainly used for lighting. One household owned some electrical appliances, but the use of electricity was limited to lighting and preparing foods that do not take a long time to cook. Households have between one and six lights but usually two or three with at least one light placed outside. The placement of the lights in the home seems to reflect power relations in the household; rooms chosen for electrification were, in some cases, the rooms used by a mother-in-law or a sister that supports the family. The choice of whether to have electricity was mostly made independently by women who are being supported by their husbands, although purchasing of appliances needed the approval of the husband or the family member supporting the family (in one case a sister). No household reported on placing a light in a cooking hut. It can therefore be argued that the extended use of electricity for cooking purposes is limited.

Another issue that impacted on the choice of where to place the light fittings is the type and state of the house. Household 1 chose not to electrify the remaining two rooms of the house because "they were made of clay and not strong enough", while household 3 chose the 2.5A option because they needed to build a new house and would want conventional electricity there. Household 4 only had one light bulb but would like to wire the rest of the house when it is completed while household 8 also indicated that they chose not to place lights in the old rooms because "they were falling down". It can therefore be concluded that the building type and condition of the house influenced the choice of how many lights to install as well as the level of supply opted for. Household 8 also opted for only one light in the current house since other structures on the property were disintegrating. They will, however, electrify the new house being erected on the house plot.

The other main influence on the household's choice in electrification was affordability. The issue of affordability impacted on the household's ability to choose conventional metered electricity, to afford more cable and wire as well as to replace broken light bulbs and lamp shades.

6.5 Acceptability of the supply and tariff options

Households reported that they liked electricity and reasons for the statement varied between being able to kill dangerous insects, being able to see at night and enabling the children to study at night. One respondent said that electricity improved their lives but the statement is difficult to understand since the house has only one light in the children's room and the respondent therefore did not have the benefit of using the light herself.

The increase in the flat rate tariff from R8.50 to R15 was initiated without consulting the community and many people are unable to pay the R15. The financial burden of the flat rate is particularly heavy on pensioners who use their pensions to support their whole family. The Community Centre believes that the coupon system would be ideal for Mafefe. The Community Centre itself has had its electricity cut off because they cannot afford the flat rate. They have no income and are all volunteers. The 2.5A supply is not considered enough because people cannot use it for cooking. Most people aligned to the chief are professionals and they can afford electricity, but other people find it difficult to pay. Eskom did not clearly explain the type of electricity they were bringing. They went to the Tribal Authority and but did not disseminate the information to the villages. The Community Centre does not know whom to approach when they have problems relating to electricity and they do not understand how Eskom functions.

Most households, with the exception of household 9, indicated that they would have preferred a card system or pre-paid electricity. This would have given them more flexibility and would have enabled them to budget for electricity expenses. Apart from households seemingly having had little choice in being electrified - "the chief said we must have it" - they also indicated that they did not have a real choice in relation to the

supply systems - "if you could not afford the connection fee of conventional electricity you were given the limited supply". Rich households, therefore, had a real choice while poor households had virtually none. Due to lack of information about which appliances can be used on the 2.5A supply, households indicated that they would have preferred a higher current. However, most appliances that they wished to use could be used with the 2.5A supply and more information would enable them to utilise the electricity better. Affordability of appliances remains a problem.

Most households found the increase from R8,50 to R15,00 unacceptable. They regard R15,00 as too much to pay for lighting alone and, during the second field visit, a consumer boycott was organised between a few households to protest against the increase. Households were also unhappy because they were not informed about the increase. One household reported seeing a poster but most households only found out about the increase when they went to the EA to pay the monthly flat-rate. Some of the respondents interviewed were illiterate. The only form of communication about the increase appears to have been posters put up in some of the shops. This is a particularly useless means of communication when dealing with an illiterate population.

People expected Eskom to inform them through a public meeting. No meeting was held and the household boycott was called "to make Eskom come and explain about the increase".

The 2.5A load limited supply option was devised by Eskom in an attempt to broaden access of the rural poor to electricity. The load limited supply was offered as an option in the level of supply for household electrification with the view that it would broaden choice as well as access of rural households. However, because most households are very poor, they technically do not have a choice in electrification supply levels. They cannot afford the higher level of supply so they have to opt for the load limited supply. The load limited supply is, in many cases, costing households more for their energy services. It must be asked if it is fair to expect people to pay R8,50 or R15,00 for the use of one or two light bulbs for two to three hours per day. Households with a regular income in the form of pensions and remittances are more able to afford the flat rate and possibly benefit from it, while some households are so poor they have to save up to afford a replacement bulb. Although having access to electricity through a 2.5A connection is more affordable for households than a regular grid connection, the benefit derived is limited. It can therefore be concluded that this service which was designed to accommodate the rural poor is in fact impoverishing already poor households while benefiting the relatively affluent ones.

7. Conclusions and recommendations

The electrification of Mafefe reflects the general dilemma of rural energy provision. Expansion of the electrification grid is an expensive exercise and consumers utilise electricity mainly for lighting purposes. Income to the utility is therefore limited and inadequate to repay capital investments. Electricity does not have a dramatic impact on all households although there were instances where access to electricity improved the situation of households. Further, since the survival of a household is not dependent on electricity as opposed to woodfuel for cooking, households regarded electricity as a "nice to have". In a situation where multiple fuel use is practised by households, electricity became just another fuel available within the range of household fuels. The costs associated with the fuel as well as the appliances seem to make it a fuel for the already rich and affluent. It was indeed found that the more affluent households in the study benefited more from electricity than the poorer households. Since the impact of electricity on the quality of life of households in rural areas cannot easily be measured, it cannot be recommended that households should not be electrified. What can be recommended is that households must receive adequate information to base their decisions on before electrification takes place.

The electrification process in Mafefe presented many opportunities for improvement. Communication and information dissemination would need to be addressed as a matter of priority by Eskom and its contractors. Communication about the project in general but also information regarding electricity use, safety aspects and which appliances can be used with the limited supply option should be provided. Careful investigation into the local dynamics of the community as well as an objective analysis of the energy consumption patterns and priorities of households in the target area is recommended. The idea of establishing a local organisation to act on behalf of Eskom is a good one, provided that the organisation can fulfil its functions and obligations and steer clear of local politics.

In terms of energy policy formulation, the need for a coherent, integrated, national rural energy policy is emphasised. Only within an integrated framework can rural electrification be offered as part of the strategy to address rural energy needs. There is, furthermore, a clear need to incorporate rural electrification and rural energy provision within a larger framework of rural development to adequately address rural development in an integrated manner.

Specific conclusions can be summarised as follows:

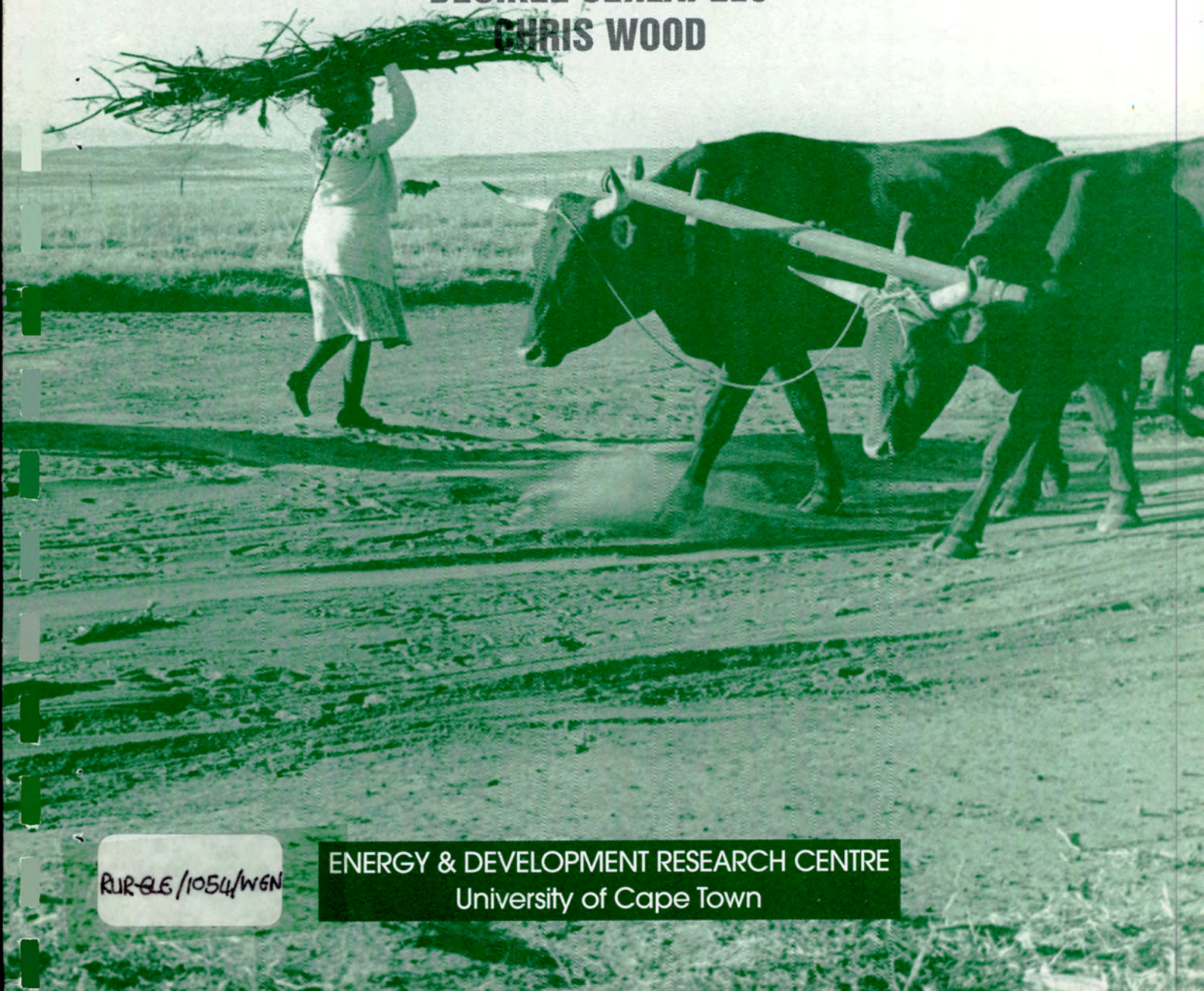
- It can be concluded that electrification increases inequities between rich and poor households. Specific interventions such as the 2.5A supply option which was intended to benefit poor households, actually impoverished them.
- Electricity is used to a limited extent and therefore no clear, wide-ranging benefits of electrification could be found in the study sample.
- Electricity does not replace any household fuels but did exert an influence on the use of IP where a broadening of IP end-use could be observed.
- It is of vital importance for an organisation such as Eskom to be aware of local politics and social dynamics since such issues can impact severely on the success of the electrification attempt.
- The creation of the Electricity Agency was a good concept but should be implemented in a different manner.
- The labour-based construction process did contribute to the community but in a limited way. Even where skills transfer is a component of the electrification process, if there are no other projects in place in the community to make use of the new skills, little value would have been gained by the community.
- Information dissemination is essential and new ways of communicating essential information to rural communities should be investigated and implemented by Eskom and other service providers to rural areas.

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A post-electrification study of the Mafefe electrification project

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