University of Twente

The role of Micro Finance in the Up-take of electricity

A case study of Small and Micro Enterprises in rural areas of Bolivia

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Date: 5th of July 2006
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The challenge: … is to overcome "energy poverty" wherever it occurs and to meet the energy needs of our poor rural communities…

- UN Conference on Sustainable Development -

ABSTRACT

This document is an academic thesis research project that forms the final step for the MBA in Environmental and Energy Management offered by the Centre for Clean Technology and Environmental Policy (CSTM) and The Technology and Sustainable Development Group (TSD) at the University of Twente. It is also part of the EASE Program developed in Bolivia, Tanzania and Vietnam.

Current literature related to the linkage of energy and poverty believe that there is not a sole and isolated factor for the up-take of modern energy, instead it is in relation with factors associated to the infrastructure, culture, geographical location, income levels and micro finance; in other words the livelihood framework of the beneficiary.

In this context, whichever the approach is or findings are resulting from empirical observations, there is a general concern about the impact of enabling energy sources in Small and Micro Enterprises in rural areas.

The present research examines and analyses these factors in the productive sector of rural areas, considering only the non-farming Small and Micro Enterprises (SMEs), and its relation with the up-take of electricity.

The EASE team in Bolivia, the NGO called Energética, made the process of selection of the sample communities, in where from a universe of 400 communities, 40 were randomly selected from where 32 were visited for the present research and considered as representative.

Some of the most important findings expressed along the present document are not only related to the SMEs itself but also to the good and advanced Micro credit system developed by some agents of the financial sector in Bolivia, such as the Financial NGOs and Cooperatives.

Since there are a limited number of options of finance for small entrepreneurs, the significant developments of these formal institutions represent for them a favourable and an interesting source when looking for funds.

However, because of the extreme poverty that most of the rural areas are sank in and the fear towards the high interest rates and non payment punishments only few are willing to opt to these alternative funds, even when they are available. But, as expressed in the present document, this situation of fear decreases with the size of the community[1], the bigger community the higher the willingness for credit, but this willingness for credit is not necessary related to energy sources that represent in the majority of the cases their second or third best investment option.

[1] In where there is a physical presence of the Micro Finance Institution.

Resulting form the research it is also observed that the existence of micro enterprises in the rural areas is almost null and the ones that are establish were not a consequence of the electrification. The electrification itself hasn't brought the development or establishment of productive enterprises, so these impact relation seams to take place in very long periods of time when other favourable conditions take place such as good infrastructure and developed agricultural activity.

In the research area, the technical characteristics of the electrification and the electrification policy, did not give alternative job creation opportunities through the SMEs, because it was done under an "equity" criterion, resulting in an intensive agricultural society. In this sense, electrification policies should go beyond the basic lighting benefits to the objective of sustainable development of the communities.

Thus, a case study[2] was performed in Cochabamba – Bolivia with the use of a quantitative-qualitative description and a qualitative analysis of the data, taking as a starting point the poverty cycle developed by the EASE Project[3]

[2] Yin, R.K. (2003) Case study research, Design and Methods. Applied Social Research Method Series, vol. 5. London: Sage.
[3] Please refer to Appendix 1 and for further information refer to: www.ease-web.org

GLOSSARY

Civil Society	For the present research, it is understood as a group of humans grouped by mutual interests, participation in characteristic relationships, shared institutions, and a common culture.
Environment[4]:	Relates to the interaction between natural components of the geosphere and biosphere as well as to their interaction with social and economic factors, with special emphasis on the territory in which they are deeply rooted.
Gender:	A system of socially defined roles, privileges, attributes and relationships between women and men, which are not determined by biology, but by social, cultural, political and economic forces
Household	Economic and Social unit represented by family members.
Informal Sector[5]	Is defined as the group of people who are self employed, family members with out a formal salary and other people that are occupied in establishments of less than 5 employees.
Micro finance[6]:	Is the supply of loans, savings and other basic financial services to the poor.
Modern Energy:	(In the literature review) Refers to the variety of energy sources including LPG, kerosene and electricity, either grid or off-grid (whether generated by burning fossil fuels or by using alternative renewable sources such as solar, traditional, hydro or wind).
Poverty[7]	Is not only the lack of material goods, but also is integrated and influenced by the insufficiency of knowledge and representativeness in the society.[8]
Productivity:	Capacity of the nature or industry to produce with a certain amount of labour, land, capital or any other resource.
Rural areas:	The concept is related to small towns with an average of 100 households.
Small and Micro enterprise (SME):	Refers to a small business that produces goods or services for cash income. The number of people working is less than 10 workers[9]. For the purposes of this review, the term small-enterprise is assumed to include the terms small business, small-scale enterprise, micro enterprise, household enterprise and family business.

[4] Environmental European Agency: http://glossary.eea.europa.eu/EEAGlossary/search_html

[5] Unidad de Análisis de Políticas Sociales y Económicas – UDAPE, Situación del empleo en Bolivia. Oct 2005, page.9.

[6] http://www.gvep.org/section/services/capacity/microfinanceworkshop

[7] Fundación Milenio. Las reformas estructurales en Bolivia Tomo II. Fundación Milenio, 2000.

[8] For the present research, the methods to classify poor people are the ones used by the National Institute of Statistics: the Index of Unsatisfied Needs and the Poverty line based in the income per household.

[9] In line with the official definition in Bolivia by the National Institute of Statistics – INE. www.ine.gov.bo

LIST OF ACRONYMS

CDND	Comité Nacional de Despacho de Carga (National Committee of Load Dispatch)
CSTM	Centre for Clean Technology and Environmental Policy
EASE	Enabling Access to Sustainable Energy
FFP	Fondos Financieros Privados (Private Financial Funds)
GDP	Gross Domestic Product
HH	Household
IDB	Inter-American Development Bank
ITDG	Intermediate Technology Development Group
LPG	Liquefied Petroleum Gas
MDG	Millennium Development Goals
MEM	Mercado Eléctrico Mayorista (Major Electric Market)
MRT	Monofásico con Retorno por Tierra (Monophasic with Return by Land)
NGO	Non Governmental Organization
SA	Sistemas Aislados (Isolated Systems)
SBEF	Superintendencia de Bancos y Entidades Financieras (Superintendence of Banks and Financial Entities)
SDE	Servicio de Desarrollo Empresarial (Service market for Business Development)
SE	Small Enterprises
SH	Superintendencia de Hidrocarburos (Superintendence of the Hydrocarbon Sector)
SIN	Sistema Interconectado Nacional (National Interconnected System)
SMEs	Small and Micro Enterprises
STI	Sistema Troncal de Interconexión (Main System of Interconnection)
TSD	Technology and Sustainable Development
UN	United Nations
YPFB	Yacimientos Petrolificos Fiscales Bolivianos

ACKNOWLEDGEMENTS

There are many people and organizations that made this study possible, so it is difficult to mention all of them in a small piece of paper, however, I would like mention some that with out their support, confidence and assistance this research would never have had been possible.

First of all I would like to thank God and the Virgin Mary that guided me throughout this time and gave me the strengths to reach this point.

Many thanks to my family whom with their continuous support and love encouraged me to go on and reach my goals.

Special thanks to Dr. Joy Clancy and Annemarije Kooijman-van Dijk whom in their quality of mentors collaborated unconditionally and professionally in the elaboration of the present research and gave me the opportunity to be part of the EASE Project, thank you very much.

Thanks to the EASE Project team in The Netherlands who made my fieldwork possible and pleasant. I also want to thank to ENERGETICA for their directions and warm welcome in Cochabamba.

Thanks to the respondents who were willing to share their experiences with me and gave an essential input for this study.

Last but certainly not least, thank you Rianne, Angela and my friends for the great experience of the Masters Course.

- Jaime Sologuren -

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This thesis represents an academic research project that forms the final step for the MBA in Environmental and Energy Management offered by the Centre for Clean Technology and Environmental Policy (CSTM) and The Technology and Sustainable Development Group (TSD) at the University of Twente. It includes all the relevant aspects mentioned by Verschuren and Doorewaard (1999), in designing a research project.

Recent debate on poverty reduction started to recognize the importance of energy in order to satisfy other human needs such us education, health care or clean water (Etcheverry, 2003; Smith, 2000; Cecelski, 2002). The debate and importance of modern energy becomes higher when speaking of the productive uses, ranging from improving food supply to income generation activities through micro enterprises.

A case study was performed in Cochabamba – Bolivia with the use of a quantitative-qualitative data and a qualitative analysis of the data, taking as a starting point the poverty cycle developed by the EASE Project[10] in which the lack of surplus in the enterprise conditions itself to invest in the enterprise and hence making it impossible for them not to break the cycle.

The present research consists of five sections. The first sets the scene of the study topic by giving the background and the description of the problem, it also gives the research objective and research questions. It includes as well the goal of the research and previous works and studies done by different researchers in the area. In this section the author gives a broad overview of the selected towns and the importance of those under study in terms of geographical location and types of enterprises, in function of their activities. Section two looks at the country context giving an overview of the Small and Micro Enterprise situation in the country. It also gives background and current information about the situation of the micro finance and energy sectors in Bolivia. Section three presents the analysis of data and findings of the research. Section four discusses the findings from section three against the background of the literature review and the experience of the EASE researchers in Vietnam and Tanzania. The arguments raised in the discussion are used to support the conclusions of the research. Finally, Section five presents the conclusions from the analysis done on section four and in relation to the research objective and questions.

[10] Please refer to Appendix 1 and for further information refer to: www.ease-web.org

1. Background and description of the problem

1.1 Energy and poverty

The energy dimension of poverty - energy poverty - may be defined as the absence of sufficient choice in accessing adequate, affordable, reliable, quality, safe and environmentally benign energy services to support economic and human development.

- World Energy Assessment 2000 [11] -

The Focus on the linkage of modern energy, understood for the present research as gird electricity only, and poverty with the general idea that improving access to modern energy can reduce poverty has become larger during the past years, to the point that The UN Commission on Sustainable Development at the World Submit on Sustainable Development has called access to sustainable energy a “prerequisite” for halving poverty by 2015 (ITDG, 2000).

Clancy has commented that energy is not widely recognized as a "basic need" in development matters, and working relationships between macro-economists/engineers, and other social scientists, have been slow to develop in the energy sector regarding its implications in poverty alleviation measures (in contrast to other sectors such as health and agriculture). Cecelski considers that, in her perception, different "ways of thinking" are partly responsible for this lack of attention given to the links between poverty and energy. Poverty and gender thinking prioritises people, while energy thinking often prioritises other objectives such as efficiency or environment, issues that are considered to have less connotations in development circles in contrast with the first ones. The few attempts to view energy primarily through a poverty optic are quite startling in challenging us to alter our perspective (Cecelski, 2002).

As Barnett, in the EASE Newsletter April 2005, mentions that the energy dimension of poverty is related to the fact that poverty reduction implies the accumulation of assets over time that can be seen as the increase utilization of energy services in order to improve living standards, so energy access is seen as an asset that might have poverty reduction implications when people use those energy services in their daily activities. Thus it is important to say that poverty has different dimensions[12] and energy use is not only influenced by these but also has an influence on reducing it.

[11] Cited in Cecelski, 2002.

[12] Income level dimension, insufficient access to public services (health, sanitation, energy access) , insufficient participation in political spheres and different degrees of complex social limitations.

1.2 Energy in enterprise

Small enterprises, enterprises with less than 10 workers, and the impact of modern energy are major areas of study, but as cited by Meadow et al. (2003), there are not too many studies that analyse both topics simultaneously[13].

However, from those few studies, researchers bring up that the notion that modern energy can and does act as a stimulus for the emergence, growth and continued development of small enterprises is relatively strong and gaining support in the literature (Fakira, 1994; Folley, 1990; Karekezi, 2002). Nonetheless, Meadows and her co-workers (2003) admit the existence of some observers that are more cautious in suggesting a direct and positive energy – enterprise relation; like Hosier, (1994) where in his analysis of urban[14] households[15] he mentions that rural household energy use, both quantity (i.e. hours of using electricity) and form (i.e. fuel used for lightening), responds to price and availability which is directly linked to the level of income.

This positive effect of modern energy on enterprises that is expressed in the literature is sustained by anecdotal evidence that is commonly used to support the hypothesis that modern energy can and does play an important role in stimulating micro enterprises.

Evidence to support the previous statement can be found in Nepal where a Hydro plant installation brought the establishment of small enterprises (Rana-Deuba 2001) or the case of South Africa where public lighting brought the possibility that Micro and Small Enterprises are able to operate in the evenings (Meadows et. al. 2003).

Nevertheless, there are also complementary reports and positions such as Barnett (2001), where he states that improved energy services are necessary, but not sufficient condition for the development or establishment of new enterprises. On the other hand, Rogerson (1997) (cited by Meadows et al., 2003) creates a sceptical scenario regarding claims made about the benefits of modern energy for small enterprises, pointing out that such claims are often exaggerated.

Meadows et al. (2003), also mentions that the introduction of modern energy can and has brought negative impacts to the communities and called that damage part of the "price of progress". Batliwala and Reddy (1996) cited by Meadows showed how the replacement of hand milling by small-scale motorised mills meant that the poorest people in rural communities were often

[13] So many programs such as rural electrification are limited in understanding the potential impacts of their introduction because they are based mainly on general statements (i.e. political promises) and little empirical data (i.e. no concrete base line studies).

[14] In his study of Tanzania he mentions that his results are not as different form the ones that might be expected in rural areas.

[15] The present research links Households and Small or Micro Enterprises in the sense that most rural SMEs are located inside or as part of the Households´ physical condition. For a detail concept of SME please refer to the Glossary of the present document, page 5.

deprived of the few wage-earning opportunities, which were available to them before the introduction of modern energy.

But the debate goes further when other authors state that energy becomes a relevant output for income generation only when certain economic capacity is reached and/or depending on the characteristics and needs of the enterprise (Meadows et. al. 2003)[16], meaning that only when a certain level of needs such as infrastructure, number of selling products, etc. is satisfied, energy does become relevant.

In this context of debate, whichever the approach is or findings are, resulting from empirical observations, there is a general concern about the energy – poverty relation, whether the impact of enabling energy sources to small enterprises in rural areas might have on income levels, and consequently reducing poverty.

In this sense, the present research analyses the energy-poverty-small enterprise linkages under the Bolivian context in order to find and analyze elements of difference or similarity with other experiences. So it tries to analyze why the differences and/or similarities occur.

1.3 Small and Micro Enterprises (SMEs)

During the 1970s, experience in developing countries and critiques of development efforts converged on the fact that industrialization and modernization policies were not producing the expected social and economic improvements (Marcelle and Jacob, 2005). In this context, since the 70`s many workers decided to opt for or continue with the Small and Micro Enterprise strategy[17] because of the necessity for an income. SMEs are now a major source of employment and income in many countries of the third world (Mead and Liedholm, 1998) like in the Latin America region in where around 44%[18] of the population is employed in the SME sector. As is explained in the following section 2.1, Bolivia is not the exception since its importance under the Bolivian economy is constantly increasing.

The micro enterprise "strategy" derives from recognizing that self-employment is an important economic option for groups whose ability fully to participate in the mainstream of the economy is somehow restricted. Groups using a deliberate micro-enterprise strategy consist primarily of low-income and unemployed people. More specifically, they include the working poor: those who have found themselves jobless as a result of economic restructuring, those who cannot make ends meet from the part-time and temporary work, and

[16] The analysis of the characteristics of the enterprises in the research sample is presented in section 3 of the present document.
[17] Developed by people who find themselves marginalized from the formal employment options.
[18] Rosales, Lucia. Reseña sobre la Economía Informal y su organización en América Latina. Global Labour Institute, 2004.

those who find corporate companies currently inaccessible or undesirable for any one of a number of other reasons (Servon, 2000).

This economic group of people, which is mainly constituted by women who also have lower formal educational rates compared to men and consequently less competitive advantages to opt for a job in the formal job market (Sologuren, 2001), opts to establish their own enterprises.

This majority of female entrepreneurs are also related to societal reasons since they suffer low rewards in the labour market, exclusion and discrimination due to social stigmas. In some cases women opt for some short term trainings such as secretary, hair cut, sewing, etc. which can be seen as women empowerment however, men still are the head of the house and the burden over women increases due to the fact that they become full time entrepreneurs which is an addition to her day to day activities (i.e. household duties, child care, etc.) (Sologuren, 2001).

Another important gender – enterprise relation is the one stated by Clancy (2004) in her study of Urban Poor Livelihoods. She says that there might be a division in types of enterprises owned and operated by men and women, since the latter trends to operate home based enterprises. Thus it is perceived that this is also a consequence of social stigmas due to it is perceived by society that women are responsible alone of the household and child care so they are conditioned to establish a household enterprise.

In the rural context, it is possible for people to opt for the micro enterprise strategy by starting two different types of enterprises in relation to the nature of its main activity: farming and non-farming[19]. Reardon (2001), mentions that people start SMEs in non farming activities are motivated by two factors: a) pull factors, such as earning higher incomes via better returns in this sector vs. the farming sector, and b) push factors: such as risky farming or land constraints and missing insurance, consumption and input credit markets. Under this strategy we can mainly find women (Klein, 1992) since they find alternative survival activities because the physical and market environment represents a few alternatives for them and because they are driven to use non-farming employment options to smooth annual incomes.

This classification of farming vs. non-farming enterprises has been increasingly identified as a key component in rural job creation and the raising of income in rural economies (Allderdice and Rogers, 2000), because of the potential that non-farming activities might have in rural areas as alternative job creation sector.

As will be explained in more detail in section 2.1, Bolivia is not an exception of the reasons previously explained of why people opt for the SME “strategy” or the innate characteristics of a SME. In Bolivia, following the study made by the

[19] The present research concentrates only in non-farming small enterprises.

project called PROMER[20], the rural SMEs represent over 1,336 SMEs of which only 7.9% are non-farming enterprises from where 87% are women operated that suffer and are conditioned to the previously mentioned findings for other researchers. In general as explained in the following section 2.1 the importance of the SMEs in the Bolivian economy is indisputable and its importance over time will continue to increase since the growth of incipient formal sector to capture the demographic growth is three times lower than the informal sector.

Thus, the reason why this study will be concentrated in the non-farming SMEs in rural areas of Bolivia is to analyse its impact in poverty alleviation by accessing them to electricity. In this context, it is understood that the lack of investment capacity inside a SME conditions it to the use in quantity and form of energy sources. So the present research analyzes the micro finance options available (understood not only as micro credit but also family or personal savings) as an instrument to overcome this barrier by giving the SME the possibility to use electricity in their productive activities.

1.4 Micro finance

"…the phenomenal growth in the number of micro finance beneficiaries represents the combined achievements of thousands of innovative institutions around the world… The United Nations system is proud to be your partner in this work, and you can count on our support as you continue your efforts to achieve your goal of reaching 100 million of the world's poorest households by the year 2005"

- Mr. Anwarul K. Chowdhury [21] -

During the 90's, researchers, governments and participants in general put micro finance into a global context. They acknowledged the critical role of micro finance in mobilizing resources and highlighted the importance given to micro finance as a tool for poverty eradication. In this light, a consensus emerged that successful micro finance operations relied upon the existence of an enabling environment consisting of efficient and adequate infrastructures; health related schemes, insurance policies, adequate regulatory framework, sound macro-economic environment and financial stability, as well as a greater involvement of civil society[22].

Many organizations have dedicated them-selves to supporting micro enterprise development through a range of services. Micro finance (the provision of small amounts of credit) in particular has emerged as a significant tool to aid micro entrepreneurs whom are excluded from the formal banking sector.

[20] Monares, A. and Bustamante, W. Situación y Perspectivas de las Pequeñas Empresas Rurales en América Latina. Programa de Apoyo a la Microempresa Rural de América Latina y El Caribe – PROMER. May 2004.
[21] Africa Advocacy Forum II: Micro credit – A Solution for Africa? United Nations, New York. Nov 14th 2002. Page 4.
[22] Statement that will be corroborated in the findings section IV of the present document.

Under this light of action, projects and initiatives took place all around the world regarding the empowerment and strengthening of the micro finance sector as a poverty alleviation tool in where some good experiences raised.

The case of Bolivia provides a good example where the growth of the micro finance sector contributed to the growth of the financial system in the country and the growth of sub-sectors[23]. However, other countries experienced failures, such as the ones occurred in the Southern Africa region where it was not appreciated by national governments and the donor community that poverty was multi-sectored and therefore, the war against poverty had to be waged on many fronts. Both did not appreciate that there was no Blue Print for poverty alleviation and therefore there was no single tool in fighting poverty, in where money or financial resources alone, though important, are not sufficient. This does not means that the donor funds where not available but the governments and donors did not understand that funds for poverty alleviation have to be linked to public investment in infrastructure[24] (i.e. roads, energy or power, water, health services and education), creating an enabling environment and establishment of a legal framework to regulate the activities of NGOs and other non bank financial institutions (Africa Advocacy Forum, 2002).

One thing that we kept hearing in relation with micro finance during the last five years, is the though that there is still a great need to mobilize funds to meet the MDG goals, however, available funds have not been oriented to poverty eradication projects. In Bamela's (2002) opinion, one aspect of the problem is that when some funds finally reach the poorest, the level of management of these funds is not sufficient enough to boost the results. Consequently, who receives funds and how they are managed have emerged as major challenges.

Others are more sceptical regarding the benefits of micro finance, considering micro credit as a harmful factor. There is the contention that credit is "more useful for those who are better off than the poorest since business crises are more serious for them when loans fail" (Rogaly, 1997). Or as mentioned by Tsogbe in the Africa Advocacy Forum II (2002) stating that Nicholas Colloff of Opportunity International, said: ...it is a "dangerous illusion" to believe that large injections of private capital will create new and viable Micro Finance Institutions because measures such as this one have to be link to other sectors such as market and/or infrastructure; so it is important to foster intersectoral, backward and forward relationships by establishing consumption or demand linkages in order to create employment and income and strengthen the poor's purchasing power[25].

In this context, it is seen that there is a wide concern about what micro finance can do for poverty alleviation purposes. Thus the following sections analyses

[23] For empirical data please refer to section 2.2 of the present thesis document.
[24] Considered important to understand the needs and worries of the poor.
[25] Tsogbe. Edem. Micro credit, Agricultural Output and Food Security. Africa Advocacy Forum II. United Nations, New York, 2002. page 20.

the relation of micro finance and its effect in Small and Micro Enterprises, in particular the up-take and use of electricity.

1.4.1 Micro finance and SMEs

As previously stated, the development of SMEs in developing countries and the consequently informal sector[26] is considerably higher than the development of the formal one. The International Labour Organization (ILO)[27] says that the year 1998 Bolivia had 59.5% of its Economic Active Population (EAP) working in informal activities and by 2003, this population will represent about 63% (UDAPE, 2003)[28] resulting a 5.9% increase between 1998 and 2003.

For this informal sector mainly constituted by SMEs, the role of micro finance has become more and more important as been the main source of funding for those who are excluded from traditional financing services and opt for the micro enterprise strategy previously explained in section 1.3.

Many regions in the world had put themselves objectives of promoting the SMEs development such as Africa in where the key priorities of governments in the Africa Region are: (i) scaling up rural access to modern infrastructure; (ii) promoting non-farm income generation by enterprises (Fishbein, 2003).

Evelin Stark at the GVEP Workshop (2004) mentions that micro finance can not solve all the problems of the poor but innovative micro finance schemes have opened up pathways for economic activities (SMEs) and access to financial services for the poor. In this context, she also mentions that reliable sources of credit provide a fundamental basis for planning and expanding business activities.

The Micro Finance tool has proven in many countries to be a great success, showing that the "poor" do not only have saving capacity, but are also solvent The "solvency" concept is related here to the fact that despite the high risks that micro finance institutions have to face when giving loans associated to the potential "defaulter clients"; their customers have the capacity of repaying their loans and later asking for higher amounts. Thus small entrepreneurs can break the poverty cycle that they are sank in by creating an investment capacity.

Some examples showed in the GVEP Workshop (2004) are in Lombok, Indonesia, where the average income of Bank Rakyat Indonesia (BRI)

[26] The Informal sector is defined as the group of people who are self employed, family members with out a formal salary and other people that are occupied in establishments of less than 5 employees. (Unidad de Análisis de Políticas Sociales y Económicas – UDAPE, Situación del empleo en Bolivia. Oct 2005, page. 9)

[27] Hussmanns, R., du Jeu, B. (2002). ILO Compendium of official statistics on employment in the informal sector, OIT, n°1.

[28] Unidad de Análisis de Políticas Sociales y Económicas – UDAPE, Situación del empleo en Bolivia. Oct 2005

borrowers increased by 112%, and 90% of households graduated out of poverty or Bangladesh in where the Bangladesh Rural Advancement Committee (BRAC) clients increased household expenditures by 28% and assets by 112%. As other examples we also have El Salvador, where the weekly income of FINCA clients increased on average by 145% or in Ghana where 80% of clients of Freedom from Hunger had secondary income sources, compared to 50% for non-clients.

It is important to remark that in the previous examples, the success of micro finance in terms of enhancing the economic opportunities for poor people, can not only be attributed to the availability of funds but also to an understanding of an integrated concept of the potential and limitations of micro finance (i.e. risks, interest rates) as well as understanding the energy needs and the key barriers (i.e. infrastructure, market and presence of Micro Finance Institutions - MFIs) for accessing to modern energy of poor people.

In this context, the access to consumer for financing the delivery of energy services surely depends on the availability of suitable mechanisms and institutions that are willing to provide capital.

Thus, from an understanding of the energy demands of people, an innovative micro finance sector and compromised entrepreneurs, the outcome is a solid micro finance sector with institutions with repayment ratios of up to 99%, in where female customers, as their feeling of social obligation is generally stronger than male customers, results in better repayment ratios. Moreover women use the credit for the improvement of the families' economic and social situation, which also leads to better repayment situation of the household.

In addition to this, MFI have shown that it is possible to cover their high operational costs[29], while even making a profit, which is the example of MFIs in Bolivia (Table 1).

Table 1
Micro Finance Institutions profitability (%) [30]

	Rate of Return Over Assets (ROA)		Rate of Return Over Equity (ROE)	
YEAR	1998	2005	1998	2005
Mutuals	1.5	1.5	10.5	13.8
FFP	2	1.1	11	10.5
Cooperatives	1.9	1.5	9	9.8

Source: SBEF

This is the reason for the growing activities of commercial institutions, which leaded to the development of various Micro finance products and the Micro finance individual lending technology.

[29] Arising by the lengthy evaluation process since they have to travel long distances to rural areas for collection purposes or simply to verify the existence of the project; follow-up of customers in order to insure the monthly payments after the money is disbursed; and high risks because of the low profitability of some SMEs and its´ instability in the market

[30] www.sbef.gov.bo

1.4.2 Micro finance and Energy

During the Global Village Energy Partnership "Workshop on Consumer Lending and Microfinance to Expand Access to Energy Services" (2004), it was also expressed the worldwide concern about the role of micro finance in order to improve the access to energy services for the poor. In this regards, it was also expressed the micro finance for energy in relation to SMEs have proven to have poverty implications[31].

The "poor" in the developing world have in general no access to financial services (loan and deposit) of "conventional" banks. Reasons for this are the lack of material collateral as well as of a credit history from the customer's side, and comparatively high operational costs. This is particularly the case on female entrepreneurs since the property of the collateral is under the name of the men.

Allderdice and Rogers (2000) mentioned that the micro finance sectors' innovative re-thinking of modern banking, meaning "accessible and flexible loans for everyone", has provided lending mechanisms specifically for the micro entrepreneurs because of their inaccessibility to traditional banking, meaning "loans with high collaterals for everyone".

In their opinion, micro finance institutions are now challenged to funnel resources as efficiently as possible to their customers. This availability of capital coming from energy-focused funds form "funders" to MFIs, as well as demand for energy from the micro enterprises, creates an opportunity for micro finance intermediaries to include loans for energy technologies in their portfolios for SMEs.

In this context, Micro finance institutions find in energy a new loan item that will strengthen their clients' (SMEs) portfolio and diversify their own lending portfolios.

At the 2004 GVEP Workshop on microfinance, Harish Hande from SELCO – INDIA[32] said that access to modern energy services can be greatly enhanced if people could also access to loans that meet their needs so they can pay for these services. However this depends on the availability of suitable mechanisms and institutions that are willing to provide capital to poor rural clients.

There is plenty of literature about real experiences regarding micro finance and renewable energy[33] from where most of the cases had positive relation with SMEs development. Without the presence of micro funds the success of the

[31] www.gvep.org/section/services/capacity/microfinanceworkshop
[32] Idem.
[33] This is quoted here only as reference of existence. The analysis of Renewable Energyzation defined as giving access to energy for people with solar, wind, water or biomass operating technologies, is not part of the present research.

Renewable Energy projects wouldn't be possible due to the constrain of the required collateral at the "conventional" banking sector.

One example of a "successful" use of microfinance and energy access is the case of Sarvodaya Economic Enterprise Development Services Guarantee Ltd. (SEEDS)[34], which is a micro finance institution (MFI) in Sri Lanka that has been in operation since 1986. With over 30.000 families beneficiated with loans for SHS and over 1.900 families beneficiated with Village Hydro (VH) their programs are widely recognized, in order to carter rural off-grid communities with identified benefits in improving quality of live. Its mission is "to eradicate poverty by promoting economic enterprises for a sustainable livelihood." where "poverty" is defined as an inability to fulfil ten basic needs, of which one is access to modern energy services. This experience can lead us to believe that we can "energize the world" by giving access to funds for poor people, but we have to be more sceptical since the results of the present research show (section 3.1) this is not always the case.

In regards to renewable energy projects, a major challenge for the wide-spread dissemination of Solar Household Systems (SHS) is to find an answer on how to overcome the existing gap between the product price and the target customers' income: the average annual per capita income in the developing world is of 1,250 US$, and even lower in rural areas. In contrast to this, the price of a SHS is 500-1,500 US$, depending on the country, taxes, market size, etc. Thus, only around 3% of the potential customers could afford to buy a SHS on cash bases, so, the "safe" cash market is small[35].

To approach the problem of the high up-front costs associated with many renewable energy technologies, financing schemes allowing payment by instalment have to be offered, such as credit, leasing, and fee-for-service.

Under this light of action a lack of adequate delivery capability, particularly for rural credit, has been a barrier in creating programs that are affordable for end users and that ensure cost recovery. So we must look even more seriously at the pivotal role that sustainable micro finance can play, and is playing, in enabling reliable and continuous modern energy services for the poor in their own perspective.

As explained in the example of SEEDS, many projects around the world are related to enabling access to electricity for the rural poor by renewable energy technologies but the existence of projects related to grid connections are not as many as for renewable technologies. Therefore the need of this research in analyzing only grid connection programs and the effectiveness of them in reaching their target populations with the role of micro finance in this complicated task.

[34] www.seeds.lk

[35] This means the security of selling SHS by enterprises with "zero" risk since the beneficiary pay for the system immediately and no loan is involved.

1.5 Factors in the up-take of modern energy in the small enterprises.

The literature suggests (Cecelski, 2002; Reardon et.al, 2001 and Slesenger, 2005) that there is not a sole and isolated factor for the up take of modern energy in rural areas by enterprises, instead this is determined by a several mixture of factors depending on the conditions and characteristics of the enterprise itself and the enterprise environment. And even sometimes when modern energy is available it is still not used by the enterprise (Slesenger, 2005)

Reardon et al. (2001), mentions that the levels of infrastructure, the education of the HH members, the gender of the head house, the employment option and the ownership of the physical space in where the electricity will be installed, are factors that influence the up-take of electricity are in relation with the infrastructure, education, gender, and the land holding effect and employment option of the people in rural areas. Others, like Shaw (2004) identifies three categories of barriers to the up-take: geographical, financial and socio-cultural.

One of the factors empirically identified in the up-take of electricity is micro finance - understood not only as micro credit but also family or personal savings. But, does micro finance represents the main factor for the up-take of electricity? Shaw (2004) considers that the impact of micro finance is strongly determined by the initial level of income of the household (i.e. cattle holding, own land ownership, characteristics of physical living place), and Reardon et al. (2001) state that the importance of micro finance for the up-take of electricity is still questionable.

The present research tackles this questioning by concentrating in the analysis of the role of micro finance in the up-take of electricity in small enterprises while analysing the other related factors in a broader perspective.

1.5.1 Finance as a Key factor

As previously mentioned in the last section, the literature suggests that a mix of factors influences the up-take of electricity by small enterprises.

Micro finance, whether it is in the form of a loan or micro credit or as personal or family savings, are considered to be as part of a total enterprises' needs, rather than be considered as the main important factor for the SME to connect to electricity.

The Micro credit Summit convened in Washington, DC in February of 1997 is one of the most visible examples of efforts been made to focus the world's attention on the importance of micro credit in development. The Summit launched a worldwide campaign to reach 100 million of the world's poorest families, especially women, with credit for self-employment and other financial and business services because women are the ones mainly involved in micro

enterprise activities of those families for increasing their working conditions. In this context as stated by Smith (2000), Enersol's projects[36] are good examples of helping women to meet their energy needs.

However, as mentioned in the beginning of section 1.5, micro finance impact is still questionable as a catalyst for SMEs establishment or development. Shaw (2004) experienced this when finding that even where sufficient credit is available, poor people are reluctant to expose themselves to the risks associated with large loans. Barnett (2001) supports the idea that the success of small enterprises goes beyond the provision of credit for energy sources. On the other hand, Wamukonya and Davis (1999) believe that financial barriers are the main issue for accessing of households[37] to electricity due to the high upfront costs.

Nonetheless, the micro enterprise and the associated micro finance activity have started to gain spaces in recent studies such as the one made by Allderdice and Rogers (2000) in where they express that this relation (micro enterprise and micro finance) is helpful in unlocking the human capacity in rural communities[38] by providing income that in turn could possibly be used for improving the quality of life in both, home and community.

So, with the general aim to illustrate and assess the role of micro finance as a factor for the up-take of grid electricity, the present study is developed in order to find and contribute to the existent literature with the findings of the case study in Bolivia.

2. Research objective

The goal of the present research is to assess the role of micro finance on the up-take of grid electricity by small enterprises.

3. Research questions[39]

Central question:

- What is the role of micro finance in the up-take of grid electricity by small enterprises?

[36] Enersol finances are generally household systems, which women directly benefit and control.
[37] Especially in rural areas the enterprise operates inside the household due to cost saving (extra rent payments) and possibility of women to take care of both the house and the enterprise. So this has a direct impact in the household economy by using those savings for children education, food supply or other basic household requirements in order to satisfy basic needs.
[38] As expressed by Allderdice and Rogers, the use of energy increased for example the carpentry productivity (200%) in Bangladesh or was useful for refrigerating the fish for a Indonesian fishermen.
[39] In order to realize how and where the research questions are answered please refer to Appendix 2.

To investigate this area a sub questions will be answered during the present study:

1 What do other researchers say about the energy - poverty relation under the SMEs perspective emphasizing in the role of Micro finance and what are their findings?

2 What is the SMEs situation in Bolivia in terms of access to infrastructure, market and governmental support and why the importance of studying them under a country perspective?

3 How does the Micro finance sector in Bolivia works in terms of structure, actors and types of micro finance mechanisms offered to SMEs and why of its importance for the SMEs as sources of finance?

4 How does the Electricity sector in Bolivia works in terms of structure and actors and how do they affect the SMEs decision of using grid electricity?

5 Which factors are necessary to combine with micro finance, and under which circumstances, to enable the up-take of electricity by small enterprises?

5.1 Which characteristics of the enterprise (including enterprise activity) play a role in sources of finance dedicated for investment and how do these characteristics influence the enterprise decision to use electricity?

5.1.1 What is the current situation of the rural SMEs in electricity use and why of their situation?

5.1.2 How does the SME characteristics influence in entrepreneurs when looking for funds?

5.2 Which characteristics of the enterprise owner play a role in the requirements and barriers to use electricity and how do they affect the micro finance source to be used for an electricity connection?

5.3 Which characteristics of the environment and institutional context play a role for choices that entrepreneurs have to invest in electricity and sources of finance for investment in terms of:

5.3.1 Why does the Utilities policy in terms of rates, quality and action plans affect the up-take of electricity by SMEs?

5.3.2 For which types of investments are these finance sources used in small enterprises and why do they prioritise these investments?

5.3.3 Which are the common finance sources used by SMEs and why do they choose that source?

5.3.4 Why do market conditions affect the decision of up-take of electricity?

5.3.5 What is the current Governmental support to SMEs in terms of seeking its development as alternative job opportunities?

4. Methodology

This study is considered to have a case study strategy, in where the units of study are the rural Small and Micro Enterprises (SMEs).

The study gives the opportunity to explore in-depth the relation between micro finance and small enterprise productivity in selected communities in Bolivia.

Through the use of a mix of complementary data collection techniques, such as interviews, observations on site and literature review the present research provides an insight in the problem in all the aspects and relations between the micro finance and the up-take of electricity inside a SME productivity.

The use of both quantitative and qualitative data collection methods and a qualitative analysis of them were used in order to give first the reader an overview of the current situation and later an analysis of the findings is presented. The qualitative research was used to explore and understand the quantitative data and to compare it with the literature and other experiences. In this context, the use of and extend literature review and firsthand data gathering techniques reduces chance.

Thus, as part of the present research study, it was used both, empirical and secondary sources in order to accomplish the objective.

Empirical Data:

- Interviews in 32 communities[40]:
  - Personal semi structured interviews with small enterprises.
  - Personal semi structured interviews with selected authorities in the towns.
- On site observation.

Secondary sources:

- Literature review.
- Interviews with experts (micro finance and electricity utility).

[40] Since the existence of SMEs in the rural area of Bolivia is almost null, it was decided during the field work to change the initial scope of only 4 communities to 32 communities with the objective to have a more representative sample of analysis in which more solid foundations of analysis can be based.

During the thesis proposal development it was expected to have as a research unit of analysis only Small and Micro Enterprises located in rural big towns that currently have availability of electricity but are not connected. However, because of the non-existence of enterprises with those characteristics, it was decided to modify the scope of the research by including all the SMEs that can be found in all the visited communities in order to have a bigger and more representative[41] sample for analysis. In this context, it has been interviewed all the existent SMEs considering gender implications when doing the analysis of findings.

In accordance with the definition of SME of the National Institute of Statistics in Bolivia[42], only enterprises with less than 10 employees where interviewed and all of them located in the west, southern-west and south part of the department of Cochabamba – Bolivia. The small enterprises in each village are identified and classified by types of activity and only Non-farming activities are considered because of the scope of the EASE Project which this research is part of (refer to Appendix 1). However, it is important to mention that different results might rise from studies in different areas of Bolivia where more governmental or donors funds injections are present or in regions that are richer in natural resources[43] such as the tropical region of the country.

The research involves a series of interviews[44] among small enterprises with access to electrical grid connections that are and are not connected to the grid[45] as well as interviews with the community authorities, the electricity supplier and micro finance institutions. The interviews were done in Spanish but in some cases the use of a translator from the local language to Spanish was needed[46].

The research questions are answered throughout the present document by analysing the findings related to the factors that impact the up-take of electricity with contrasting the existent literature and findings from the researchers in Tanzania and Vietnam in relation to [47]:

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[41] Due to the fact of almost non-existence of SMEs in the research area and because all the ones that exist were interviewed, the research sample used in the present study is considered representative only for the present study research area. However the generalization of the conclusions of the present study for the whole Bolivia should be taken carefully because of the variety of land characteristics and climate conditions as well as natural resource availability inside the country; facts that might vary the impact of electricity due to initial levels of wealth among communities.

[42] www.ine.gov.bo

[43] Refers to areas of the country where the land in more fertile, have water, natural gas reservoirs, availability of wood for exploitation or big scale mining.

[44] To see the utilized interview please refer to Appendix 5.

[45] Despite that the results might vary from regions the pattern of electrification in the country is similar with exceptions of isolated electricity generation systems. (see section II. of the present document)

[46] In some communities the people only speak the local language called “Quechua”.

[47] Please refer to Appendix 2 for a guide table of how and where each research question is answered.

a The characteristics of the enterprise:

- Type of activity
- Location
- Legal Situation
- Nature of ownership
- Seasonality of operation
- Equipment in use
- Priorities of expenditure

b Respondent/Owners factors:

- Gender
- Level of formal education
- Personal skills
- Household characteristics

c Environment and Institutional context:

- Electricity supply
  - Price
  - Quality
  - Action plans
- **Micro finance**
  - Loans or micro credits
    - Government funds
    - NGOs funds
    - Banks or formal financial institutions
  - Personal savings
  - Family savings
  - Friends or Community funds
  - Accessibility
- Market
  - Regional or national markets
  - Population market
  - Artesian work
- Governmental support

At the core of analysis is the micro finance factor, which is studied with findings and cross results from each of all three mentioned divisions (a, b and c). Under this perspective and in order to answer the sub-questions and consequently the main research question, it is decided to scan and characterize all micro-enterprise activity as well as its owner and environment characteristics within a community by selecting communities that have been electrified in the different electrification phases that took place since the 90's.

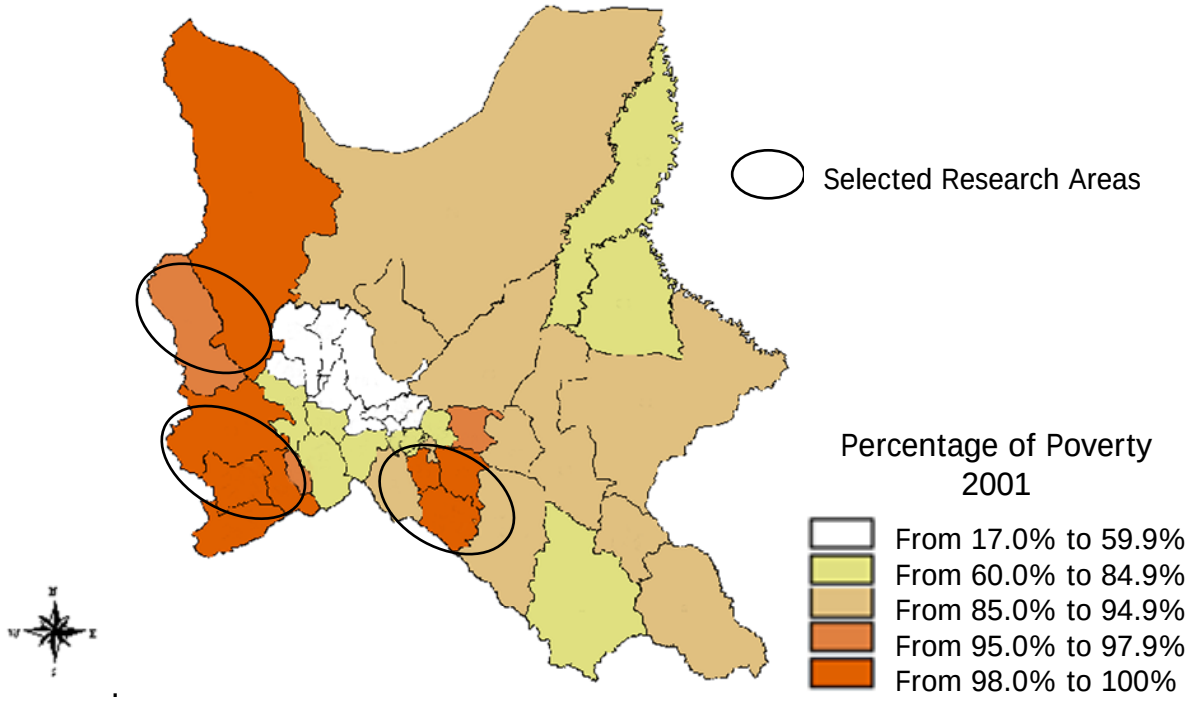
4.1 Research area selection

The research area of the present thesis draws on the one determined by the EASE Project team in Bolivia lead by Energética[48] since the present research represents a contribution to the EASE Project (Appendix 1).

From a total population of 400 communities, the EASE Project team in Bolivia selected at random 40 communities, which all were grid-electrified under the Phase I and Phase II of the rural electrification phases that took place the years 1998 and 2002 respectively.

The selected area for the present study is located inside the department of Cochabamba[49] as presented in Figure 4.1.1. and has 32 visited communities, which represent part of the same sample of analysis used by Energética for the EASE Project. The visited and interviewed SMEs are located in a range of communities with more than 85% of its population considered as living under the line of poverty;[50]. So these communities represent the poorest people in the region.

Figure 1
Map of the Department of Cochabamba



Source: National Institute of Statistics based in the number of persons earning less than the basic salary of 440 Bs. per month

[48] An NGO legally establish in Bolivia.
[49] Please refer to Appendix 3 for detail information about the geographical, economic and demographic situation of the Department.
[50] Defined as people that earn less that 440.00 Bs. per month. This is the minimum amount that the government established that a HH needs in order to buy the amount of basic goods.

The visited communities have different weather conditions ranging from communities located over the 4.000 meters over the sea level to some located at only 1.000 meters. So the economic activities vary and with it the types of SMEs.

It is also important to mention that all the Tropical part of the Department (Chapare region) was intentionally excluded as a potential research area because of the great economic assistance that those communities have due to the Alternative Development Program that the Government and USAID mainly is implementing to substitute the Coca leaves plantations with other farming and non farming activities. It was considered that this financial source might cause some bias when analysing their finance sources.

In this context the significance of the research area is related to the above mentioned change of the "unit" of analysis where all the existent SMEs where interviewed in the 32 communities. However, it is important to consider that some results of the present research might vary when analysing other regions of the Country where the injection of funds from the Government or donors (i.e. Chapare region) may stimulate productive activities in terms of establishment and/or innovation (such as taking a grid connection). Theses regions also refer to regions that are richer in terms of the availability and quality of natural resources (i.e. wood, water, land and fossil fuels.). Thus, it is important to be cautious when making generalizations of the findings presented in this document.

4.2 Research units

As mentioned, in the thesis proposal it was expected to have as research units of analysis, Small and Micro Enterprises located only in rural big towns that currently have access to electricity but are not connected. However and because of the non-existence of enterprises with those characteristics in rural big towns (except for some walking sellers or small food vendors that are explained in the next section) it was decided to modify the scope of the research by including all the SMEs that can be found in 32 communities.

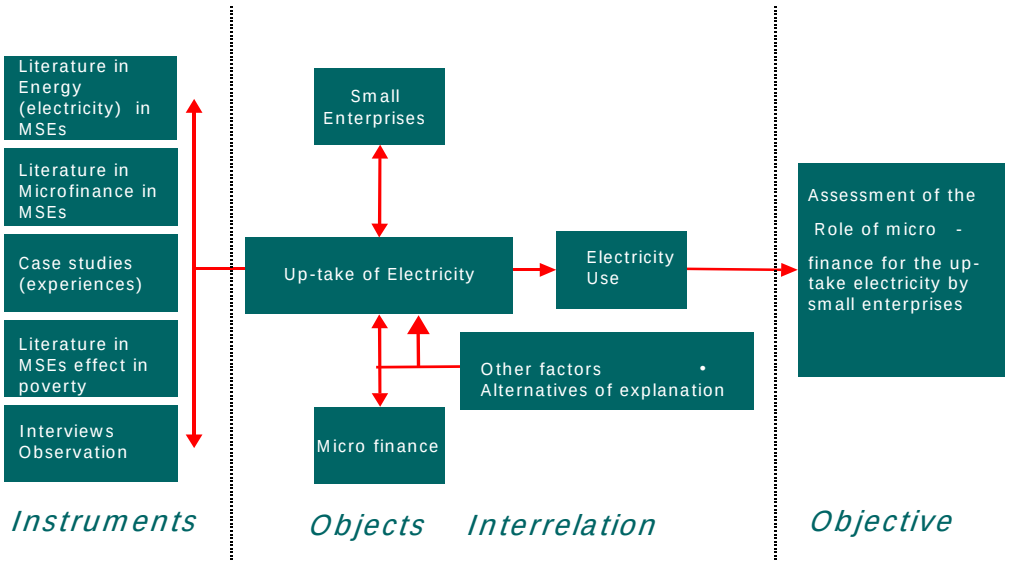
The research involved an interview survey (Appendix 5) conducted among electrified and un-electrified small and micro enterprises that were selected within communities randomly, except SMEs that had unique activities inside a community that were all interviewed. It was conducted during the month of July 2005 and the quantitative analysis was undertaken by using Microsoft Excel in order to perform the qualitative analysis based in the quantitative information.

A total of 22 enterprises were interviewed in 14 communities (See Appendix 4), as well as local authorities such as Mayors and Community Leaders. The majority of the interviewed SMEs were small micro commerce followed by small food vendor. The results are present in section IV.

5. Research framework

In this "approach", Figure 1 indicates the steps done during this research in order to be able to achieve a satisfying final result.

Figure 2
Research Model



With the use of first and second hand data and sources of information such as data collected on site and literature review, an analysis was made about the linkages between micro finance and small enterprises in relation with the use of electricity for productive activities in rural communities by SMEs. The interrelation of these three and the role of other factors considered in the use of electricity for productive activities are also considered as part of the analysis. After the analysis of the role of micro finance for the use of electricity inside the enterprise an assessment is presented in order to answer the main research question.

II. Country context

The present section gives a background and current information about the Small and Micro Enterprises in Bolivia by giving statistical data and a qualitative analysis of its importance in the Country. Besides, this section also presents an analysis of the micro finance situation and the characteristics of the grid electricity situation in the research area with the objective to give to the reader and overview of the situation that this research concentrates in.

2.1. The Small and Micro Enterprise (SME) Sector in Bolivia

This sector is the responsible of one over three jobs in the Andean Community, (CAF, 2003) and because of its complexity due to not only the lack of up to date and reliable official data but also the great societal implications that has, and its importance in a globalise economy[51] should be analysed with great careful.

The small businesses have become the soul of the economies in most developing countries due to their dynamics and their role in providing employment. This is related to the economic crisis that many developing countries are facing, situation that derives in less stable job positions and great mobility of the labour force in the market. People facing such instability opt also for alternative sources of funds to smooth the income in the household by opting for the SME strategy[52].

Since 1999 till 2004, Bolivia is suffering a marked decline of its growth, especially in activities related to the manufacturing and construction sectors (intensive sectors in labour force). In accordance to the National Institute of Statistics (INE)[53] the rate of unemployment grew from 4.4% to 8.7%[54] from 1999 to 2004. Studies and forecasts based on the growth of the economy for the first semester of 2005 (3.97%) expect that the unemployment rate for the present year could decrease to a level of 8.65%.

[51] Because in developing countries the incipient industry and the market openness trend is deriving in increasing the SME sector due to the low capacity to adapt of the industrialised sector to the demands of a globalize world and consequently growth with higher capacity of labour force absorption.
[52] For an explanation of the "strategy" please refer to section 1.3.
[53] INE (2004). Actualidad Estadística. La Paz – Bolivia.
[54] The rate is calculated on the bases on the unoccupied population which is part of the Economically Active Population (PEA) that did not work the previous week of the date that questionnaire was done, or was available to work and looked for a job or at least made concrete effort to establish a own business in a determined period of time (For further detail in the definitions please refer to www.ine.gov.bo)

This trend of growth of the economy is the main determinant for the continuous growth of the SMEs in Bolivia that reached 5.9% from 1997 to 2004. A trend that is also expected to continue for the coming years.

In Bolivia, 36% of the population is located in rural areas and in the last decade the rural population stayed practically stationary with growth rates near to zero. However, the rapid demographic growth in the urban areas overcomes the job creation possibilities due to the low industrial capacity. The external openness and low competitively of the manufacture sector resulted in not only creating a more unbalanced base of growth between rural vs. urban development, in favour of the last (5.3% vs. 1.2%)[55], but also in allocating the labour force in activities directly involved in informal sectors[56] characterized by the precarious conditions of the job activity, resulting in ways of subsistence.

The informal economy in Bolivia is characterized by activities that require low capital, so it is easy for people to access, simple technologies and with low salaries. These characteristics of the informal sector and the low formal education levels of the Bolivians is also another possible explanation of the rapid growth.

In Bolivia, the majority of small enterprises and practically all the micro enterprises are informal, which means that are not registered in the official entities, therefore they operate illegally. The reasons for this condition of "illegality" vary but the current taxation system and regulations that operate the enterprises are the main barrier for small entrepreneurships to form part of the "legal" sector.

Therefore, the mentioned condition of "illegality" has not only implications at a macroeconomic level (i.e. underestimating levels of employment, national income losses due to lost taxes, smuggle, etc.) but also at the social level where most labourers work under inhuman conditions; suffering exploitation, abuse, insecurity, low quality working environment and health risks.

In Bolivia, it is estimated that 50% of the Economically Active Population works as informal and they generate 35 to 45% of the jobs[57]. Besides, they also contribute to 25% of the GDP and their growth is three times faster that the enterprises in the formal sector because of the low capacity of the last in absorbing this new working force resulting from the rapid demographic growth.

[55] Programa de Naciones Unidas para el Desarrollo. Bolivia: Prospectiva Económica y Social 2000 – 2010. La Paz, Bolivia, 2000.

[56] Defined as all the labourers that do not have a stable and sufficient salary or all the labourers that work under own activities (Women in Informal Employment Globalising and Organizing - WIEGO, Addressing Informality, Reducing Poverty: A Policy Response to the Informal Economy, 2001, page 1)

[57] INE (2004). Actualidad Estadística. La Paz – Bolivia.

Another explanation of the rapid grow of informality in urban areas is the high migration from the rural areas and again the impossibility of the formal sectors to absorb them in their lines.
Regarding SMEs in rural areas it is important to highlight that there is very low information. However, the project PROMER[58] estimated the existence of 1336 thousand SMEs in the rural areas of Bolivia (Table 2) from where 90.6% are considered as informal.

The same study mentions that despite that the agricultural sector is the main employment option in rural areas, the non agricultural sector has great possibilities of job employment specially for the most marginalized and vulnerable group of rural people, meaning by that: women and children, with out mentioning what sort of jobs and its relation to the use of electricity.

Moranes and Bustamante (2004) also highlight that despite that these potential benefits of the non agricultural sector are identified as alternative income generation activities; it is precisely the sector that is less supported either by the governments or international donor projects.

In this context it is seen that despite that some observers identified the job creation potential of the non-farming activities still there is no support from the government for this type of entrepreneurs, this leads us to believe that either they do not pay attention to the reality of the rural Bolivia or they just do not want to realise this. So it is important that new support projects of non-agricultural activities should be implemented the sooner the better.

Table 2
Number of Rural Small and Micro Enterprises
(In thousands)

Farming	Non-farming	Total
1220	116	1336

Source: PROMER – 2004.

In this context the importance of studying rural SMEs in Bolivia as a key fast labour force absorbing sector, gives to the case study the in-depth in answering the main research question.

2.2 The Micro Finance Sector

Generally excluded from the traditional financial services and with out the required collaterals and documentation when asking loans, the SMEs development was conditioned in size, productivity, income increase and consequently poverty connotation. This lack of access to credit by sectors of the economy in the past years, was the internally driven reason for the development of the Micro finance Sector in Bolivia.

[58] Moranes A. and Bustamante W. PROMER Project 2004. Fondo Internacional de Desarrollo Agrícola. La Paz – Bolivia.

The micro finance has become during the past years a key sector of the economy by increasing the dynamics of social sectors in their activities by providing financing mechanisms (i.e. micro credits, deposits, insurance, etc.) mainly to poor people. Access to such funds enables them to opt for alternative job activities or investment opportunities or consumption decisions that had positive effects in their lives (i.e. increasing Household income by investments in technology[59]).

The present section does an analysis of the micro finance sector in Bolivia considering its importance for the SMEs activity; considering the governmental and non-governmental support given to the SMEs with the actors involved under the structure of the micro finance sector currently operating in the country.

2.2.1 Importance of the Sector

As it is explained in detail in the next section, the main micro finance actors in Bolivia are the Banks, Mutuals, Cooperatives, Financial NGOs and FFPs. However, for the present research, the personal savings and family loans or savings are also considered an important source of financial resources available for small entrepreneurs.

Besides those main actors, in the country, there is also the existence of informal financial institutions (lenders) that operate in places where the existence of formal financial services is null. They offer credits at very high interest rates better known as “usury”. Some times these people are family members or relatives that when the entrepreneur has no personal savings and no access to micro credit institutions they opt for that.

Also money sent by relatives aboard represent an important source of funds. This type of micro finance is not considered an actor but it is important to mention as one of the means that poor people have in order to finance either consumption or productive activities.

2.2.1.1 Support to the Small and Micro enterprise

In Bolivia, the governments´ intent to facilitate the SMEs access to credit has consisted in promoting formal lending institutions to assist this sector. The promotion was also implanted with specially designed regulations and norms[60]

[59] For examples please refer to:
http://www.gvep.org/section/services/capacity/microfinanceworkshop

[60] In the case of the Micro Finance Institutions (MFIs), the norms that regulate its functioning are divided in: A) Loans Norms, this is related to provisions that the institution have to have in case of non payments by the clients. B) Risk Management Norms, this regulates the degree of exposition that the MFI has to the risks associated with any activity and how the MFI covers itself form eventual problems. C) It has also been created the Credit Information Bureu, in

in order to regulate and supervise the financial entities activities[61] when giving loans.

Currently there are many programs to assist small enterprises that are generally run by NGOs but there is one big program of support to small and micro enterprises (SMEs): SAT - CEDE MyPEs due to its name in Spanish. It works only in the urban areas of all the departmental capital cities of Bolivia. This program does not work with rural SMEs due to its conception and because of the high concentration of them in the urban areas.

The CEDE MyPEs constitutes the point where the different actors of the small-scale business entrepreneurs meet. In order to achieve the vision of developing the Service Market for Business Development (SDE), the program consists of modular programs offered through the net of CEDE MyPEs providing technical assistance, referential information, and subsidies to the SMEs that cover 70% of the costs of the SDE and are dictated by different accredited service suppliers.

This program is mainly related to capacity building and training activities to small entrepreneurs. One important requirement is that the enterprise has to have already some time operating in the market but not necessary in the formal market. It does not apply to enterprises that are just starting, which is a big barrier for the entrepreneurship that is emerging. This condition causes the closure of SMEs because of their condition of beginners do not have access to the technical assistance of the Project (almost 30% of assistance requests are denied)[62].

It is important to mention as well, the non existence of SMEs supporting programs for the rural areas of Bolivia. The Vice Ministry of the Small and Micro Enterprise, in charge of the sector has not made any program orientated exclusively to the non-farming SMEs in rural areas. What is more, the survey for the Census used by the National Institute of Statistics does not make a distinction between farming and non farming activities in rural areas which gives a lack of official data. With this it is perceived the low interest that the government has in this classification of rural enterprises in spite of the identified potential job creation impact.

In summary, programs focusing on rural SMEs are mainly concentrated in farming activities that are run by NGOs or Foundations. Their main objective is to create the capacity in rural communities to establish productive SMEs as an

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order to minimize asymmetries in information of customers when giving loans, and the Customer Service Bureau, that assist complains or any doubts of the clients. (www.sbef.gov.bo)

[61] The main actors are: Banks, Financial NGOs, Private Financial Funds (FFP) and Cooperatives & Mutuals.

[62] After a personal interview with the head of the program in Cochabamba, Mr Michel Maldonado, was identified that due to the regulations imposed by the Inter-American Development Bank in the conception of the project requirements it was found that almost 30% of the entrepreneurs requests of assistance are denied, this is with out considering requests of rural entrepreneurs that are automatically out of the program since it is concentrated in urban enterprises only.

alternative activity to reduce the poverty situation that they are sunk in. Other programs developed by the Catholic Church and private institutions also try to empower, especially women, for starting and developing SMEs. In this context, the non farming SMEs support form is almost null with the exception of some projects related to eco-tourism.

2.2.1.2 How do SMEs do to get micro credit?

The monetary resources and the means to find them are the difficulties that affect and limit the small entrepreneurs, in this sense there are a series of factors that any person alone who is looking for money cannot rise above meaning that in some cases other additional mechanisms should be carried (i.e. partnerships or associations) in order to access for funds. Next is presented some data to show how and where an entrepreneur can access to funds generally presented in all Micro Finance Institutions.

The first step as an entrepreneur is to define what is intended to do with the loan; how and how long is it estimated to reach that goal and what is more important, be conscious of the size of the expected operation. It is also important to express how it is pretended to pay the loan and under what specific conditions.

A Business Plan with the detail information about the strategies of the enterprise, the advantages and opportunities of the product and the service or the activity in which the resources will be invested in, is strictly required.

It is also important to find a coincidence between the objectives of the enterprise and the lending policy of the institution. This means that the entrepreneur has to understand that the micro credit is under a win-win relation[63]. He or she has to submit with transparency what he or she is looking for and be conscious again that is able to accept and meet the conditions stated by the micro finance institution.

Generally, the financial institutions work with small micro enterprises that are formal or that at least have the willingness to formalize not only under the point of view of taxation but also in terms of corporative organization and culture in order to minimize the risks on the operation. Sometimes this represent a barrier for an entrepreneur when looking for funds but in the majority of the cases the entrepreneurs express good interest and willingness to become formal if that will open a door for funds.

The search of funds is always centred in the vision that a micro or small enterprise proposes the moment that it is willing to expand or enlarge its'

[63] This refers to a situation where all the parties involved are in their maximum satisfaction; this means that any moving from this point will be traduced in losses for one party and gains for the other which will produce an unbalance of the needs.

business; or well, even if the money is expected to be used to open or initiate a business or enterprise.

Two types of financial institutions constitute the structure of the micro finance sector in Bolivia: regulated and non-regulated by the Superintendence of Banks and Financial Entities (SBEF)[64].

The first group is formed by Banks, Mutuals, Private Finance Funds (FFPs) and the Cooperatives and the second group is conformed by the Financial Non Governmental Organizations (NGOs).

In this context the entities that are for obtaining credits being SMEs are:

- Banks
- Financial NGOs
- Private Financial Funds (FFPs)
- Cooperatives and Mutuals

Banks

The credit conditions and collaterals required by Banks are not accessible for small and micro entrepreneurs, because the SMEs do not have enough economic guaranties or collaterals to give.

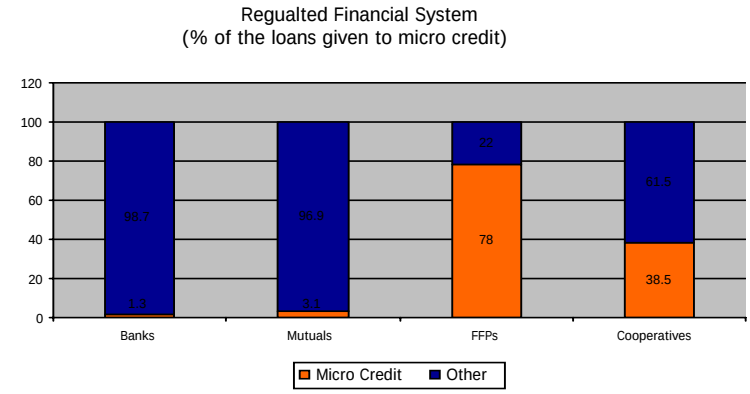
In their opinion is too risky to give a credit to a SME due to the low profitability they offer. One exception is the Solidarity Bank (Banco Solidario) or the recently former FFP called Los Andes that currently offers the service of micro credits to the SMEs under the following conditions:

- Personal Guarantee
- Current financial status
- Profitability of the business
- Mortgage guarantee

Despite that the current micro credits loans represents only 1.3% of the total loans given by the Banks (Figure 1), this has a defaulting index of 47.2%. This situation contrasts significantly with the index presented by the FFPs, which is only 4.8%. This level of defaulting is indicating a mayor efficiency of the FFPs for the administration of their micro finance activities, in general resulting from the use of adequate crediting technologies with profound adaptation in this market. The Banks can be facing the use of hybrid and inadequate credit technologies for reaching the small entrepreneurs.

[64] The SBEF is the governmental body that controls, supervises and regulates all the financial deposits in the country and has the main objective of sustaining a system of financial intermediation.

Figure 3



Source: SBEF and Fin rural - 2004

Another service that the Banks have is "leasing" in where the entrepreneur can access to new technology by renting the equipment from the bank and after a while, if they are interested, the entrepreneur can by it form the bank at the residual value[65]. This can also only under some circumstances be taken by small entrepreneurs.

Financial NGOs

The NGOs are a source of finance that is designed to offer financial services to productive and commercial sectors in the rural areas mainly. The NGOs work with foreign funds and only few have their own capital.

These NGOs are in charge of financing and supporting sectors that are currently excluded form traditional banking services such as: Productive, Artesian, Agro industrial, Commerce, Services and Eco tourism. There are no programs inside their portfolios dedicated exclusively to "Energy" but if for example an artesian needs a machine that needs electricity to operate, the artesian can present a business plan and if it is viable (positive and high Internal Rate of Return - IRR) the financial NGO has no problem in financing the plan under its framework of operations and limits of funding.

The NGOs are constituted as associations and function as non-profit bodies registered in the Ministry of Economics. They comply with their taxing obligations in accordance with the law but are not regulated by the SBEF[66]. During the five years from 1999 to 2004 their contribution to the national finance system is quite significant, with a growth in the given loans of 38.5%. (Figure 1)

With the support of FONDESIF mainly and during these past years they contributed to the expansion of the financial services in rural areas of the country. By 2004, 43% of the rural agencies of the total financial system

[65] This refers to the market value of the equipment after depreciation.

correspond to NGOs. 67% of their customers are women and from the total loans that they gave, 38% is dedicated to the agricultural sector.

Under the framework of the sectored development, Fin Rural and their partners, in alliance with the Solidarity Bank, the FFPs and Funda-pro have supported the Crediting Information Bureau (BIC) for the micro finance sector. Their services consist in providing micro credit and consumer credit information from the regulated and non-regulated financial entities, and in the future legal and commercial operations in order to homogenize the information of potential customers when evaluating his or her repayment capacity.

The interest rates that the NGOs have are:

Table 3
Range of interest rate in the MFI by type of given loan

SECTOR	INTEREST RATE
Productive	17% - 18%
Commerce	26% - 28%

Source: ASOFIN (New Economy News Paper, Nov 15th, 2005)

Private Financial Funds (FFPs)

The financial entities that recently were incorporated to the micro-finance market are the FFPs, from the data of the SBEF the FFP showed the following chart:

Table 4
Deposits in the MFI Sector

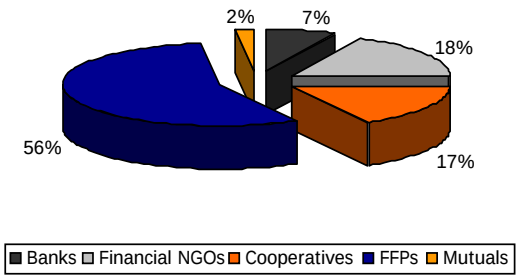
YEAR	Deposits (Millions of Bs)
1999	717.6
Dec-02	1407.8
Jul-03	1572.3

Source: SBEF - 2004

For the sector of the SMEs the FFPs are a significance alternative of finance. They started operations in the market the year 2002 due to the high demand of small and micro financial operations. Their services were highly demanded by the SMEs mainly. Today the FFP system, specialized in micro finance is the main actor of the micro finance business in Bolivia due to its strong presence in rural areas and also due to the great flexibility when allocating loans (Figure 2)

Figure 4

Distribution of the Micro credit
by Financial Entity



Source: SBEF and Fin rural - 2004

Currently, there are six FFPs in the market: Fondo para el Fomento a Iniciativas Económicas (FIE), Eco futuro, Prodem, Fassil, De la Comunidad and Fortaleza.

The activity of the FFPs is different from those of the traditional Banks, in the type of customers, instruments and their risk management. As a result it is necessary for them to have suitable technologies (i.e. rural physical presence, short term loans, customer profile records, and flexible lending portfolios) and personnel with high experience in mechanisms tailored for offering micro finance services.

The system of the FFPs, including the Solidarity Credits, has experienced not only an expansion in segments of their traditional market, but also in a diversification of the products (i.e. consumption credits or production credits).

Despite the higher operative costs caused by giving loans to rural entrepreneurs due to the high dispersion of them and the limited access to the in-situ production places; the FFPs have reached to have, in some cases lower interest rates compared to traditional Banks, which also have an impact in the funds option that a micro entrepreneur will opt for.

Cooperatives

The Cooperatives are a major important part of the national financial system due to the great number of associates[67], that its base is conformed mainly of low and middle income sectors of the urban and rural population constituted by employees, labourers, commercial entrepreneurs, small industrialists and producers, artisans, micro entrepreneurs and others.

The functioning of the Cooperatives is based on capital of self generation by the members, where the loans are financed by the savings of the partners and not by means of external funds. It is also convenient to mention that despite that the Cooperatives are not supervised, its work has a great importance for

[67] The associates are represented by the people to have their deposits in the cooperatives.

important social sectors (i.e. associations, unions or community local organizations). However, if a person that has no deposit in the cooperative, he or she is not eligible for a loan.

The Cooperatives along with the FFPs are the only entities that grew despite the non-quiet social environment, political instability and threats of the macroeconomic stability. Besides, they have applied prudential crediting policies[68] of growth in response to the decrease in the payment capacity of their customers resulting from the accentuated economic crisis. So due to the mentioned prudential crediting policies and despite that because of the same economic crisis affected the amount of "savings" available for loans, they were in the capacity of growing.

In general it is observed a good performance in the Cooperatives, in terms of their allocated loans and the increased amount of deposits from the public. These deposits enabled a major degree of growth and development of the offered financial services meaning that they not only had a good performance in the allocation of fund but also raising of them.

2.2.2 Micro Finance: The Micro credit mechanisms

From the point of view of the "collaterals", in Bolivia exist four types of micro credit mechanisms available for small entrepreneurs: Solidarity Credit, Associative Credit, Individual Credit and the Communal Bank.

- The Solidarity Credit applies to groups of people in where the participants guarantee each other for short period loans, usually between 3 to 12 months.

- The Individual Credit is given to customers where the collateral is for personal reasons or as a mortgage (for example, to buy a house, car or any other type of asset). This is the "conventional" or "traditional" credit mechanism used by the "traditional" banking sector.

- The Associative Credit is where the person who is asking the loan has to have some type of structured organization, either this is a small formal enterprise or personal association.

- A Communal Bank, which is an aggregation of people about 20 to 200 persons that share the responsibility of the administration of the financial resources given by a financial entity (NGO). They also are responsible for the obligations and all the rights for the management of those resources. They operate on the bases of the "garantía solidaria mancomunada" (group solidarity guarantee).

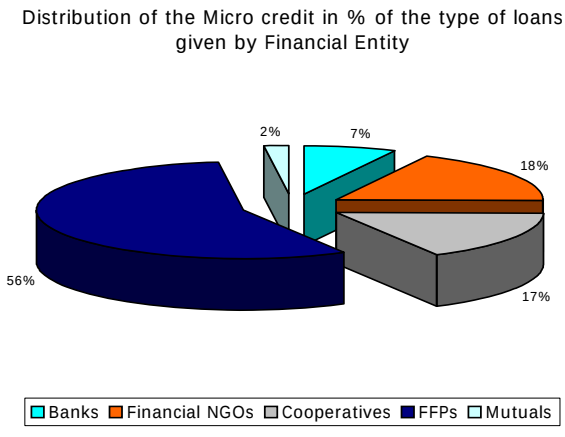
[68] This means the use of an efficient risk management. Giving loans to less risky entrepreneurships.

Due to the economic crisis (8.65% of expected unemployment for 2006) that the country is passing through generating a scarcity of jobs, all the unemployed people and the low-income people in their fight to find activities to survive have found an alternative way of living by accessing to micro credits[69]. Despite that there is no data relating to the number of SMEs that have been set up because of micro finance it is assumed that almost all the money allocated in the microfinance system was orientated to the small and micro entrepreneurship, which can lead us to believe the great importance that MFIs have inside the SMEs.

This new way of giving loans to small and micro enterprises (SMEs) consists in giving loans with personal guarantees (individual or solidarity groups). The lender, in order to know as much as possible about the persons' economic situation involved in the loan, makes a detail analysis of each individual situation in terms of their current financial position, responsibility with other current loans obligations and productive capacity related to future incomes before giving the loan. Sometimes, (see section IV), for some entrepreneurs this represents a big barrier to overcome in order to get a credit, especially those who are very small[70], so these types of entrepreneurs do not have other means of funds than their personal savings or money sent from relatives overseas as a source of funds dedicated to income generation activities.

By 2004, as the following figure shows (Figure 3), the FFPs constitute the main actors in the micro credit finance system; followed by the financial NGOs, the Cooperatives, the Mutuals and Banks. In this context the Banks gave only 1.3% of their loans to the micro credits and the FFPs did with 78%. This corroborates the specialized character of the FFPs in giving micro credits. It is important to highlight the great interest that the Cooperatives have in the micro enterprises, 38.5% (Figure 1).

Figure 5



Source: SBEF and Fin rural – 2004.

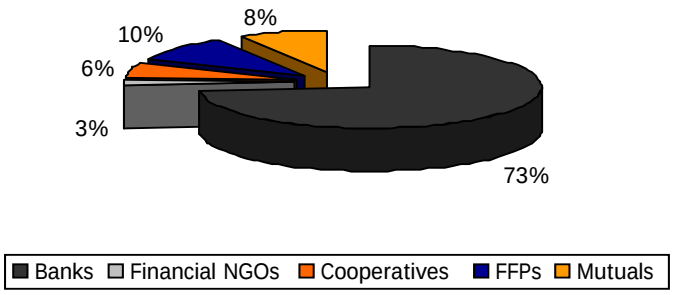
[69] The micro credits are orientated mainly to attend small enterprises with productive or commercial entrepreneurship.
[70] Defined as SMEs with less than 2 members.

The low interest that traditional Banks have in giving credit under small scale characteristics caused by the high risks associated perceptions with the innate characteristics of this type of operations put in evidence the need to widen the credit supply to this sector of the economy.

The introduction of a new financial intermediary, the FFPs, specialized in assisting this sector, represented a demanded and needed step for the articulation of the Bolivian financial system. This situation, due to the geographical and demographic aspects of the micro credit, brought access to the formal financial system a broad sector of the population including SMEs generally excluded from financial services.

Figure 6

Distribution of the Total loans in the Financial System by Financial Entity
(% over the amount of money)



Source: SBEF and Fin rural - 2004

The micro finance institutions due to its reach and geographic location are great sources of credit to the people. In fact, the Banks have the 73% of total loans in monetary terms (Figure 4) and only 152 thousand customers while the FFPs, the Cooperatives and the NGOs have about 430 thousand customers with micro credits (Table 5).

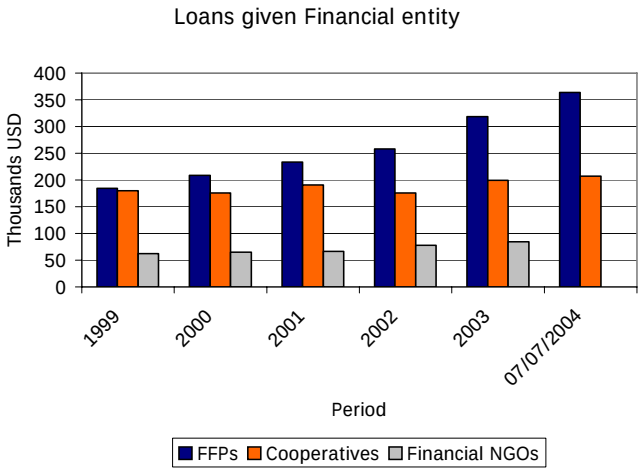
Table 5

Number of customers by financial entity		
Banks	152493	26%
Mutuals	24606	4%
FFP	182604	31%
Cooperatives	58938	10%
Financial NGOs	179295	30%
Total	**597936**	**100%**

Source: SBEF and Fin rural - 2004

The development of the credits in the FFPs was 72.7% from USD 184.3 thousand in 1999 to USD 318.4 thousand in 2003, confirming their importance in giving micro credits to small customers (Figure 5)

Figure 7



Source: SBEF and Fin rural - 2004
Note: there is no data available for NGOs for 2004

2.2.3 Conclusions and Challenges

The financial entities specialized in micro credits have presented an increasing evolution since the beginning of theirs activities. But besides that, they showed a sustain growth in their portfolios and better controls in their given loans, in a critical economic environment. On the other hand the conventional Banks experienced a contrary trend with a decrease in their given loans.

The actual economic, social and political crisis of the country plus the contraction of the aggregated demand and the reduction in the payment capacity of their customers affected the micro finance sector. The sector saw it self in the position to confront new challenges and make a constant follow up and improvements of the administration of the micro finance activity in order to guarantee its sustainability.

What is more, in this difficult context these entities have gained more involvement in the intermediation of economic resources and in the variety of crediting services. So the active participation of these entities contributed to the growth of the sector in general in a non favourable environment.

But still there are important sectors of the rural population that do not have access to financial services in the types of personal savings, credits, money transfer and others. In this sense, the main challenge to the micro finance sector is to reach those geographic zones in where no type of micro finance service exist and whose population is subjected to the whims of some people that lend money with very high interest rates.

Therefore, the key variable for the development of the Micro Finance sector is not just a number of customers that the micro finance entity can have but also the quality of the proposed services. It is important that micro finance

institutions should wide its range of services towards money transfer services, so people have access to funds that are possible for them not to default.

2.3 The Grid Electricity Situation in the Research Area

Bolivia has a long history of rural electrification that got stronger during the late 70s and with the years was considered a great political discourse in campaign periods. In Appendix 6, an overview is given of Electricity sector in the country staying the structure and actors.

It can be said that Cochabamba had three big phases of rural electrification. The first attempt to take electricity to the rural Bolivia was in 1979 till 1985 were only rural big cities were electrified and also cities that were located near of the departmental cities.

In 1997 the called "Phase I" started with any clear plan or previous studies. The Electrification Company (ELFEC) only had a series of demands for electricity access from rural communities and simple blueprints of the areas.

With out the required action plans and studies, the government was in the necessity of expending money in order to comply with political promises only with out considering or analyzing future potential impacts (i.e. SMEs development or establishment), meaning that low power lines were built in potential productive areas where the use of electricity might had have an impact.

Thus, this phase of electrification resulted in high investment costs with out the expected impact in the SME sector, situation that could have been prevented if formal and reliable technical and social studies had have been done.

By the year 2000 another phase of rural electrification took place under the same criteria used in the Phase I, which was that all the Bolivians have the right to have electricity in their homes. This was and still is the biggest electrification project in the country. The electrification was again made with out reliable technical or social studies. The studies were done on the basis of the data provided by ELFEC that later will be the company in charge of the project, so this lead to corruption suspicions. This also leads to higher costs because many planed things had to be change while the construction of the lines. Costs that at the end were in part translated to end users demanding that the equipment for the connection has to only be acquired from the utility.

During that time, the region was declared an emergency zone due to severe weather conditions and because of this, the project did not follow all the stages of evaluation and approval, so it got approved with a lot of errors and omissions, resulting again in no SME establishment or development

This time the contract referred to a recently approved Decree of rural electrification[71] that stated that it is not allowed that two companies can work in the same place at the same time, so this lead to some small monopolies in the regions and the slowly kill of local electricity cooperatives that sooner or later will be absorbed by the big players of the market. This bad situation derives in higher consumption rates and higher connection costs[72] due to the lack of competition so households have to do what the only available utility says if they want to have electricity.

In this context it seams that instead of moving forward by learning form the mistakes, the electrification actions in the area were moving backwards since this time the consumer was worse than in Phase I because he or she had almost no decision when buying the needed equipment for the connexion and obviously higher consumption rates than the ones they had with their small cooperative.

Finally, the Electrification Phase II was concluded (1999 – 2002) but with out a document of project design, and because of the bad studies some differences in cost appeared that lead to court.

So both phases of rural electrification that took place in the research were done following an equity criteria stating that all Bolivians have the right to have electricity, which is positive and the right starting point but not enough since as it is presented in chapter III almost no productive sector was identified when the communities where visited.

A Phase III is planned but at the time of writing this research there was no definite starting date. The company involved in the construction is not required to also do the administration and operation of the lines. As a consequence, because of the low profitability of rural lines there is no company that is willing to apply for that task. It is the author's opinion that this company is not going to appear yet unless some changes or norms or even some sort of government subsidy appear that will compensate this loses in some way. Obviously, it is expected that this will lead to more expenditures from the government funds, since they need to hire other experts (possible the same utility experts) for the supervision of the construction of lines since the utility won't operate lines that they are not sure if they were properly built. So this situation leads to believe again that instead of moving forward and correcting the mistakes made in previous rural electrification phases, we are moving in the contrary direction.

All the electrification phases had only monophasic return by land power (MRT), which is even lower than the monophasic with neutral, that as will be explained later is a big determinant for the SMEs in the use of electrical appliances in production activities since the power is definitely not enough. This situation as

[71] Decreto Supremo Nº 26252. Presidencia de la República. Julio 2001.

[72] The department of Cochabamba has only one electricity supplier and their connection cost are up to 20 USD higher than the ones from other electricity suppliers in other departments, for example La Paz with a connection cost of 80 USD.

explained in the Results section is expressed as a real barrier for starting enterprises dedicated to production processes.

In summary, the brought of electrical lines to the people in the research area was done only with the aim of complying political promises and with out considering the development or the establishment of SMEs.

This short vision of local authorities is not expected to change since future Phases of electrification have even more potential failures, making us to suspect that political interests and social demands will derive in a rural sector with available electricity but not connected. Thus it is in the authors opinion that facts like this should be taken into consideration at a governmental levels for future rural electrification plans in order to reach the expected impact when investing for lines in the rural areas of the country.

2.3.2 Conclusions and Challenges

The situation that rural electrification hasn't brought the establishment of SMEs is related first that the electrification was made under poor or even no previous studies and second with very low power lines that are not suitable in potential productive areas to develop a SME sector. So in order to develop this sector it is important that the government should start identifying potential productive sectors in the currently electrified communities and start building the triphasic power lines.

Another detected weakness is the one related to the small monopolies, since this situation leads to big variances of rates and connection fees in the Country. This situation should change and liberate the market completely in order to put the final customer in better position for the up-take of electricity specially the rural poor.

III. Analysis of data and findings of the research

As explained in section 3 of the present document, 32 communities were visited, and only in 14 of them the existence some sort of micro enterprise was identified.

All the selected communities have been electrified within the last two Rural Electrification Phases and are considered as significant and valid as a sample of analysis. The visited communities are part of those communities selected by Energética for the EASE Project. All are communities that have on average 100 households each and have available grid electricity prior to 2002.

The present section describes the finding resulting from an intensive field work, done during the month of July, 2005. First the enterprise context with characteristics of the owner is described, taking into consideration gender implications and second, the environment context in which the Small and Micro enterprise operates is described, while identifying any barriers involved in the up-take of electricity by the SMEs.

3.1 Results

3.1.1 Up-take of electricity under "enterprise characteristics" related factors.

During the fieldwork, 22 Small and Micro enterprises were interviewed because of the non-existence of them in the majority of the selected communities. Only non-farming enterprises were considered as a part of the research sample and located within the household.

The types of enterprises found in communities are (listed in decreasing order of number of existence).

Table 6
Number of SMEs by type of activity

Type of Enterprise	Number of SMEs
Small grocery stores	6
Communication centres	3
Typical Cloth manufacturing	3
Wheat mills (raw material for bread and the typical alcoholic beverage called Chicha)	3
Small restaurants	2
Small Hostels	2
Typical alcohol distilleries (Chicherias)	1
Tyre repair shops	1
Funerary services	1
Total	22

Source: Own Field work

The majority of the identified and interviewed enterprises were only small grocery stores that have electricity and only some were opened after the electricity arrived[73].

The previous list of types of enterprises can tell that the productive activities in the rural communities are not significant even in towns with more than 100 households. Small commerce is by far the type of activity that is preferred to start in order to increase their household income besides the agricultural activities. It is perceived that this is because of the fact that in order to establish a small commerce or grocery store usually in charge of the women it is not necessary to leave the home so the women can be taking care of the SME and also the house.

17 of the interviewed enterprises were family owned and the nature of property was "individual" the rest was "partnership" by means of some type of association between relatives (i.e. the parents own the physical space but the son put the money to supply the grocery store). During the morning and early afternoon female respondents were found because men were in the fields. At other times of the day men respondents were interviewed, however the person responsible of the SME is still the wife, because if a client comes she is the one who attends him or her and not the husband even if he is there. The main activity in the household was not the SME but the agricultural activities and 16 operate informally without any legal registry (Appendix 7).

Women are the ones that in the majority of the case decided to start the SME (10 cases) followed by men (7 cases) and both (5 cases). The main reason for the establishment was "income increase" (19 cases) and in some cases due to an identify demand of the community. So the trend is that women decide to start the SME in order to smooth the household income conditioned to agricultural activities (approx. 4 harvest per year depending on the crop). It has not been identified a pattern of the activities inside the SME in relation to gender decision of starting the SME, however there is a trend that in high physical energy demanding activities like tyre repair shops or if SMEs located outside the household like mills, men are the ones who decide to start the business. So women in order to take care of

Typical Cloth Manufacturing in the Community called Ramada
– Human energy employed only –

[73] In some communities not all the small groceries were interviewed since it was considered that a representative sample of them in the community could give the general perspective related to the questions in the questionnaire.

the children and the household in general, start the SME like grocery stores which are located inside de household (the 6 interviewed grocery stores).

To the fact of the existence of electricity only 5 respondents said that because of the arrival of electricity they decided to start the SME. However, 9 cases said that without the presence of electricity nothing will happened to the SMEs since the electricity is not directly involved with the SME activity. They expressed that they can operate perfectly with candles (all the grocery owners expressed this).

Most of the enterprises operate the whole year (14 cases). However, regarding to activities such as typical cloth manufacturing, they operate only on an irregular basis, depending on the demand and because of the lack of access to markets. Due to that the technology used is artesian, health problems occur especially back and lungs damages. They do not use electricity for manufacturing the cloths; only human energy is employed even if the household in where they operate has electricity, which is only used for lighting. They believe that in order to take the electricity for production activities they need first the technology and equipment but they do not have the money to buy them. So in these households the option of micro finance is not directly related to the up take of electricity but to the acquisition of the equipments that run on electricity. However, this new way of doing things will also remove value from the cloth because they are afraid that the products will not be considered as an "Artesian work" if they employ other technologies run by electricity in manufacturing their clothes[74].

In enterprises with out electricity the owner would like to connect but 100% of the respondents expressed that the high connection fees represent their main constraint even if they use candles or kerosene for lighting. They haven't realised the possible savings raised from switching from current fuels to connecting to the grid, even though the high connection fees.

However, this connection willingness is their second best priority of expenditure after they decided to increase the number of products for sale and quality of the physical working space. This means for example that if they have enough money to connect to the grid they will not do it unless they have the products that the community demands and they store is well built.

Electrical appliances used in a Household
– Community of Taparari –

[74] Weaving on electric loom requires finer thread which gives a smoother appearance to the cloth, in other words less "rustic" and "handmade".

It is important mention that from the interviews it was also found that depending on the type of activity (service, like a store or production, like a wheat mill) the priorities of investment varies: 11 cases said raw materials and more selling products is their priority and 6 is the physical infrastructure.

The impact of the electricity is positive for the households but it didn't highly contribute to the establishment or development of enterprises. Regarding to this, the most important and only impact that the electricity brought with, was the possibility of working during the night, but only two or three hours at the most. An activity in the town ends very early due to the need to wake up early to go to their fields for their agricultural activities. Under this finding it possible to conclude that the SME inside the household is not the main activity. This might be the explanation of why they do not have as a priority of investment to connect or use electricity for productive uses.

At a household level the electricity is used for lighting, radios, TVs or refrigerators. There is no enterprise in all the 32 communities that uses electricity for productive activities, the type of energy used is human and petrol or diesel despite that they are connected to the grid and using it for lighting. The cause of this, especially for the wheat mills, is that the available electricity is single phase only and not suitable to install bigger electrical machines (mills) for the production process which requires three phase electricity. The latter needs a more expensive infrastructure which utilities are not enthusiastic to install since they are not likely to get short term returns on their investment.

This can tell that as explained in section 2, that the fact that the electrification in the research area was done only on the bases of the basic criteria of equity (meaning that all Bolivians have the right to have electricity) is a constrain and a barrier for the development of the productive activities. Since the brought of electrical lines hasn't started a SME establishment or development.

When establishing an enterprise there is the thought that the electricity is not the main factor because there are not many enterprises using it as a production factor itself besides lighting. In the case of enterprises such as for example, Electronic Repair Services or Tyre Repair Shops, the electricity is considered as granted and not as the most important raw material even if they considered that with out the supply of the electricity the enterprise and their source of income will disappear. In such enterprises the owners are more concerned with the number of customers that they can have in the month, or the roads and the education or health inside the community, than the electricity supply. This is because the high levels of poverty since their household economy is based in what they can earn each day to satisfy their daily basic needs. In this context they do realize the importance of electricity but they do not consider it or haven't realised the role of electricity in providing them an activity of income generation.

A main concern is how to find monetary resources to develop their existent enterprise. Again even when the electricity is a core raw material the

investments in securing the supply or speaking in a general view: "investing in electricity" is not their first investment option. Hence the micro finance goes to other investment options such as increasing the size of the physical working space or simply painting the walls of the existing one or putting a bigger and brighter advertising sign.

From the total SMEs interviewed, 86% had already connected to the grid because of the development of the town itself rather than the advantages that the electricity might bring to their enterprises. The rest 14% are only small "kiosks" or "walking sellers". In the first group they see the connection as a second best priority of investment and not as the first thing that they will do as soon as they get some money. They expressed that if they have some money, it will be used first on supplying more articles for their "kiosks" and not in connecting to the grid.

Walking business "Shoe Repair" in the town of Mizque - Human energy employed -

In the case of the "waking business or sellers" because of regulations form the municipality and the utility they cannot have a connection unless they establish a fixed location. Their problem is that they don't do that because they do not have the money to buy a space or buy a "kiosk". So for them is still not the electricity their main concern but how to find the money to physically fix their business. They have no problem in using candles or kerosene lamps for lighting during the night. A similar situation is presented in the Funerary services, where because of the variance of operation they simply do not care of having electricity because with candles they work just fine.

In the case of the communication centres, the National Communication Company called ENTEL S.A. had reached a lot of communities with the use of their own solar panels that today are still working even before grid electricity reached the communities. So once more the electrification was not the main factor for the establishment of these other enterprises, instead the internally driven reasons of the company that decide to invest in the rural communication. Today their systems operate with solar PVs and are not connected to the grid even if it is available.

3.1.2 Respondent/Owner characteristics

The owner and more important the household (HH) characteristics are crucial for the establishment of enterprises but not necessary for the up-take of electricity when the SME is in operation.

The higher the income of the household the more probable is the establishment of the enterprise but the electricity up-take comes with the size of the enterprise, for example in the case of an un-electrified kiosk, once they have all the products that they want to sell and the physical space (fixed cracks, painting, etc.) is fine they will connect to the gird and not before. Hence, electricity is not their main priority of expenditure but it is one of them. The household income levels vary but the majority had average monthly income of less than 450 Bs (50 USD) per month. That gives a view of the high levels of poverty of the respondents.

Age is also a factor for the establishment of the enterprise. Since old people can not work in the fields they start an enterprise as an alternative source of income and rent their fields. Old people since they lived practically their whole lives without electricity, the benefits that electricity might bring are not determinant for them to connect to the grid (4 cases).

It was identified low levels of formal education, meaning that 50% of the SMEs owners had not completed primary school. This situation changes if the respondent is the son or daughter since their levels of education reach a maximum of "Secondary completed". So the higher the formal instruction is the lower the ages of the respondent are and the fewer respondents found. This might corroborate the idea that when rural people migrate to the cities their level of formal education is considerably low compared to the urban people, situation that puts them in a less competitive position with the urban job seekers[75]. However, 30% respondents said that their sons are studying in bigger cities and after they study they stay in the cities because there are no suitable jobs in the communities.

Regarding to the gender aspects, men are in charge of the crops and the land. Women are the ones that start the store and also the whole family works in the store, especially female small children help her and the boys help the father in the agricultural activities. However during the harvest season the majority of the household members are in the field, in this sense the SME is not the HH main activity.

This pattern of work specialization repeats in all the interviewed enterprises, in where women are in charge of the family enterprise with the supervision and ownership of the husband and men are dedicated to the field. However, this varies a little depending the type of enterprise and the time of the day.

During the morning hours and early afternoon it is very difficult to see men in the communities because they are in their agricultural fields and women are looking after the store and household. By evenings or mid afternoon men are in

[75] Sologuren Blanco Jaime. Los rendimientos de la escolaridad. Thesis for obtaining the BSc in Economics. Catholic University of Bolivia, 2001.

the town but not necessary working with their wives. So I can say that women work more hours than men but in less physical energy demanding activities.

The advanced the technology employed in the enterprise activity the more difficult is to find women in charge of it, like mills where the male owner and male employees are in charge of the flour production and women help them with minor activities.

From the interviews 70% of respondents were willing to opt for a credit were females, so women were more willing to accept or get a micro credit than men. Women in the research area are less adverse to the risks associated with the loan terms either related to the future monthly payments or the loan itself. But the final decision of taking a loan is in the hands of the husband so it is important that micro credits programs should have women as target groups with additional awareness creation campaigns to men related with the potential benefits of the activity that the funds will be invested in. (Appendix 5)

Under these owner characteristics, it is also important to mention the organization of the community since it has been perceived a huge dependence in their local authorities when making decisions. This is not only related to cultural believes of obedience but also to political oppressions because some expressed that for example if they do not follow what the Major says when doing a demonstration (i.e. blocking the roads) they suffer social exclusion and in some extreme cases one sheep disappears (i.e. community of Tapacari). So, the establishment of a productive sector in some communities is highly dependant in the view that the local authorities have about the goals of the activities in where the productive activities will be involved in and if those activities agree with the goals of the political party in power. If there is no participation of them in the process of productive development, any support to any productive development project will be in vane.

3.1.3 Environment Context

3.1.3.1 Electricity Supply

As explained in section 2.3 and Appendix 6, the rural electrical supply is done by a series of private enterprises, cooperatives or associations that work as natural monopolies that are regulated and controlled by the Government through the Superintendence of Electricity.

Resulting form the interviews in the communities, the electrical supply works generally fine. 19 interviewees said that were satisfied with the quality and quantity of the supply[76]. However, because of the characteristics of the installed systems and the demographic growth of some communities there is the fear that the transmissions will not satisfy the growing need and will collapse in the

[76] With some cuts during bad weather conditions or national festivities such as Christmas which is related to load peaks.

near future (this is the case of the Community of Morochata). This can leads us to believe that installed power is not a barrier for the development of the SME sector since they consider that the quantity of power is enough, however it is important to highlight that it is enough for what; they do don't used it for productive activities. In this context local people do not see electricity as a factor for SMEs development or establishment they are more concern with the supply for lighting.

The policy of electrification says that the company can and will electrified a house if it is not further than 100 metres from the main line that usually goes along the main road. So in communities that are very disperse, only some households have access to the grid and the other are marginalized because of the extra cost that they have to incur when connecting to the grid.

The company does not have any plans to provide incentives to their rural potential customers to connect to the grid because they say that a rural customer is in the majority of the cases a potential loss and not a profit investment. In order to solve this problem, I put as a personal proposed project the use a subsidy in order to reallocate those houses by giving some sort of finance to the people to built new homes in a designated area so they can be more gathered in one place that will be cheaper to electrify or a small subsidy to low the initial connection costs.

All the electrified enterprises interviewed pay the residential rates and not as industrial or general rates, that are lower, because the enterprise is inside the household and the meter that is used for metering the household consumption is the same as the one used in for the enterprise electricity consumption. So, asking them to connect their enterprise to another meter is impossible due to the high prices of the meter itself and the connection fees. In this context, it is important that rural tariffs should be revised creating more categories, by the Superintencia de Electricidad.

3.1.3.2 Micro finance availability

Regarding the micro finance part of the present research, the existence of micro finance institutions is limited with presence only in some of the communities visited; from the interview shows that this presence makes people more willing to apply for a micro credit because they have to incur in additional transportation expenses if people want to go to the MFI in order to ask for a micro credit.

Micro enterprise development programs developed by the government with support of international cooperation bodies are concentrated in urban areas only and not in the rural arena.

The types of micro finance alternatives that the communities have are:

- Formal micro finance institutions (banks, cooperatives, FFPs and NGOs)
- Electrification company

- Unions
- Personal savings
- Money sent by relatives that migrated to other countries

Regarding the option of micro finance for the connection fees, it is well accepted by the people but this is mainly at a household level and not as an enterprise level despite that all the interviewed enterprises were located inside the household (17 cases). Most of the enterprises had electricity and use it only for lighting. Only 3 enterprises were found with out electricity.

Most of the micro entrepreneurs do agree with the idea of the micro finance and micro credit concept. However, 80% of the cases were willing to take loans directly from the Electricity Utility rather than from other source of finance such as Cooperatives, Banks or FFPs because of the interest rates and the fear that if they won't be able to pay the loan once they got it, so they will lose everything (collaterals). In other cases the micro credit concept was considered a great alternative for accessing to electricity but this never passed through the minds of the authorities (i.e. local community leaders) in order to organize the community members to opt for a micro credit. This shows another barrier, which the lack of organization of some communities or probably low capacity of local authorities to organize people that is linked to political or personal interests.

In this sense, to the question if they have some money available from either micro finance source, what are their priorities of investment? The answer was to reinvest in equipment or buildings (11 cases) and later in connecting to the grid. Only 4 entrepreneurs had previously asked for a loan from a MFI and all of them expressed that the money was not used for the up-take of electricity. Form this small sample 3 were female owners, corroborating the statement that in the research area women are more willing to opt for a micro credit than men.

The main reason of why communities that currently have grid electricity available and the households are not connected was because of the lack of money to pay for the connection fees and the fear of not having the money to pay for their monthly consumption. This is linked to the average income per month of less than 450 Bs. (50 USD) that is used for food security or other priorities of expenditure.

However, in accordance to what was mentioned in section 3.1.3.1, the role of the local authorities again is an important a factor in order to get local people to accept or not one or the other micro finance type. In 5 communities a great dependence on what the authority says was perceived, meaning that the community will only accept the micro finance option only if it is approved by their local community leader. So in order to establish micro finance mechanisms for rural people it is important the involvement of local authorities in the process in order to maximise the participation of beneficiaries.

The Electrification Company does not currently apply the micro finance option. This was applied only for the first electrification phase but because of problems in collecting the money the Company decided not to do it for the second phase. However, their policy was only after connecting the community to the grid, the households had 12 months to pay in a fixed monthly amount of the cost of the connection fees and also their electricity consumption. It was done at a household level and not for the enterprises. I consider this micro finance option is considered a very good option for uptake of the electricity that should be implemented in the future with a better collection framework. Currently this type of micro finance does not exit.

An interesting source of funds that a lot of people have is the money sent by relatives (sons or daughters) from overseas. Some of the interviewed said that they will connect to the grid with the money that they will receive from their relatives, but it is not possible for them to get the equipment (meter, cables, etc.) from this source. So this important source of funds should be taken into consideration when the MFIs are evaluating loan repayment options.

No enterprise had a loan before for anything; the money for the establishment of the enterprise came from personal savings or from relatives such as parents or sons.

3.1.3.3 Market

In the large rural towns, levels of income of the enterprises are affected depending the day of the week, because on market days (in the majority this is Sunday) there have a higher number of customers that come to the town.

Their customers are only from their community or nearby communities. The lack of roads in rainy seasons is their main problem when trying to sell their products to big capital cities. Because costumers and the access to them represent products to sale they are more concern in roads than if the have used electricity to manufacture the products, so they care more about the regional infrastructure than if they have or not electricity in the SME.

The up-take of electricity is conditioned by market conditions since the use of electricity for production might reduce the selling price because the article will be no longer considered as an “artesian work”. This might not be an issue for local customers when buying products but still it is an identified concern.

3.1.3.4 Other barriers for the uptake of electricity

One of the identified barriers besides the lack of money is the high dispersion of the houses in the community area. Since the grid goes along the main road, connecting a house that is 50 metres distant is very expensive for both the Company or for the household. Therefore, the higher the dispersion, the less connections that can be found in the community.

Another barrier is the problem of coordination of the local authorities with the people and with the electrification company in order to find alternatives to improve the energy situation of the community. This means that due to social, political and local trends regarding their local development measures, rural people do not find ways of coordination with their own authorities in order to find the optimum path of development.

Another barrier for the enterprises to connect to the grid are the associated cost with having electricity. The bills are paid in cities that are far from the communities resulting in time and money needs for going to pay the monthly bills.

IV. Findings discussion

In the attempt of studying Small and Micro enterprises and its relation with the factors in their willingness for the uptake of electricity, this section presents an analysis of the findings from the fieldwork against the literature and the experience of the EASE researchers in Vietnam and Tanzania.

In this sense and in contrast to what some researchers found (Fakira, 1994, Folley, 1990 and Karekezi, 2002), that modern energy can and do act as a stimulus for the emergence, growth and development of small enterprises, the evidence of the present research showed that for an enterprise to be stimulated by electricity, depends on many factors, such as the line phase, access to markets and the infrastructure situation been the last the most significant.

Community called Cauta
- Electrified Village with 0% household connections -

In the case of the selected area, the electricity hasn't brought by itself the SMEs emergence or development. This is a contrary result from the experience of Rana-Deuba (2001) in Nepal where electricity brought the establishment of small enterprises.

In this context, despite that evidence from this research hasn't identified negative impacts of the introduction of electricity to the communities, it is important be cautious when making claims about the benefits of modern energy for small enterprises. It was found that modern energy itself can have positive impacts at a household level but not at a SME level.

The establishment of SMEs in non-farming activities is in relation to the first factor mentioned by Reardon et. al., 2001 (See section 1.3 of the present document); this is a pull factor where the household decides to start a SME to search for higher incomes for them rather than a push factor[77].

[77] Such as risky farming or land constraints and missing insurance and consumption.

Evidence showed in concordance with Allderdice and Rogers (2000), that non-farming SMEs constitutes a key component in rural job creation. However, in the poorest communities where the SMEs represent a good alternative for employment it is precisely where the existence of them is null. This illustrates a central paradox of rural poverty reduction strategies based on enterprise development, in that they appear to be least effective precisely where they are most needed. Therefore, the government should include this type of enterprises in rural SMEs support programs for poverty alleviation.

Evidence also showed that there is not a sole and isolated factor for the up-take of modern energy services by SMEs and in agreement with findings made by Reardon et. al. (2001) micro finance is only one of a group of factors that are related to the up-take of electricity.

Another finding that agrees the findings from Shaw (2004) is that even when the credit alternatives are available, poor people are not willing to expose themselves to the risk associated with loans given by formal institutions because of the fear of losing everything due to the non-payment punishments. They rather use personal savings of family funds for satisfying their financial needs.

In this context, micro finance for modern energy sources are well accepted at a household by increasing their quality of live and not necessary in the up-take of electricity by SMEs, evidence that agrees with Wamukonya and Davis (1999).

It is perceived no pattern of relation between the type of activity and gender with the decision of starting an SME. However, in accordance to Clancy (2004) there is a trend related to the operation of the SME, since home based SMEs are in charge and operated by women many, but the ownership is always the men.

Another gender related finding, is contrary to what Reardon et. al. (2001) said about that gender of the head of the house is a factor for the uptake of electricity; the present research hasn't found any correlation between the decision of connecting to the grid and gender.

Regarding to micro finance and gender, the present research agrees with Mayoux (2005) when she mentions that there is a need for a serious rethink of many currently accepted "tents of Best Practice" in the light of existing evidence of gender impact, because this research found that women in the research area are less adverse to the risks associated with loans than men; meaning that microfinance mechanisms should be revised in order to increase the participation of female customers, with male participation with informational campaigns of the potential benefits with the acquisition of a loan.

V. Conclusions

The energy dimension of poverty has started to gain interest among social scientists in developing circles. Real life situations and experiences form around the world makes us to believe that enabling access to energy to the poor is part of measures that governments and donors should take into consideration when fighting the war against poverty. In this context, recent debate on poverty reduction started to recognize the importance of energy in order to satisfy other human needs such as education, health care or clean water (Etcheverry, 2003; Smith, 2000; Cecelski, 2002).

Under this light of understanding of the energy – poverty relation, current literature believes that there is not a sole and isolated factor for the up-take of modern energy by Small and Micro enterprises; instead it is in relation with factors associated to the infrastructure, culture, geographical location, income levels and micro finance.

Under a country perspective, Bolivia is the poorest[78] country in Latin America and one of the poorest in the world, with high corruption levels and continuous political instability, the scarcity of jobs continues rising due to the economic crisis that the country is currently facing. From 1999 to 2004, Bolivia suffered a marked decline of its growth, especially in activities related to the manufacturing and construction sectors (intensive sectors in the labour force). In accordance to the National Institute of Statistics (INE)[79] the rate of unemployment grew from 4.4% to 8.7%[80] from 1999 to 2004. Studies and forecasts based on the growth of the economy for the first semester of 2005 (3.97%) expect that the unemployment rate for the year 2005 could decrease to a level of 8.65%.

Resulting from the mentioned crises and unemployment situation many people who find themselves excluded form the formal sector opt to start a SME that in the majority of the cases have a status of “illegality”. During the present research 73% of interview enterprises were informal without any type of formal registration, therefore “illegal”.

[78] In terms of the GDP per capita of around 200 USD in rural areas, that represents the lowest in the region.
[79] INE (2004). Actualidad Estadística. La Paz – Bolivia.
[80] The rate is calculated on the basis on the unemployed population which is part of the Economically Active Population (PEA) that did not work the previous week of the date that questionnaire was done, or was available to work and looked for a job or at least made concrete effort to establish a own business in a determined period of time (For further detail in the definitions please refer to www.ine.gov.bo)

In this context, the great importance of the informal sector in the Bolivian economy is indisputable, because of its great ability of job creation and absorption of labour force presenting a growth rate of 5.9% from 1999 to 2004.

Thus it is concluded that the SMEs in Bolivia have become the soul of the economy due to its dynamics and their role in providing employment. It is estimated that 50% of the Economically Active Population works in the informal sector which generates 35 to 45% of the jobs. Besides, they also contribute to 25% of the GDP and their growth is three times faster that the enterprises in the formal sector.

Non Payment consequences Electrification Phase II
- Meter Removal -

Evidence from the research showed that in rural areas the agricultural sector is the main employment option, however the non agricultural sector has great possibilities of job employment especially for the most marginalized and vulnerable group of rural people, meaning by that: women and children. It was also found that in the poorest communities where the SMEs represent a good alternative for employment it is precisely where the existence of them is null. This illustrates a central paradox of rural poverty reduction strategies based on enterprise development, in that they appear to be least effective precisely where they are most needed.

Under this scenario, the present research found the importance of studying the Small and Micro enterprises as important sources of employment and income generation for poor people.

Regarding the general Financial System it found that it was affected by the mentioned crises by facing a rapid increase in the defaulting number of loans obligations by their customers. However, this was not the situation of a part of the system: the Micro Finance Institutions (MFI).

The rapid success of the MFIs was a result from a genuine internal driven demand for monetary funds of sectors of the economy that were generally excluded from the traditional banking sector. Under this line, and also because of the great levels of specialization that the MFIs have, they contributed significantly to the development of the SME sector by providing micro credits with low collateral requirements and accessible interest rates. This is presented in the analysis of the MFIs portfolio in where the FFPs constitute the main actors in the micro credit finance system (56%) and followed by the financial NGOs (18%), the Cooperatives (17%), Mutuals (7%) and Banks (2%).

In summary, the introduction of a new financial intermediary, specialized in assisting the small and micro entrepreneur, represented a demanded and needed step for the accentuation of the Bolivian financial system. This situation, due to the geographical and demographic aspects of the micro crediting offer, brought the integration to the formal financial system a broad sector of the population generally excluded from financial services.

Despite the great success and continues growing of some micro credit formal institutions and high levels of specialization in an adverse macro economic environment, it is concluded that the sector needs further development in order to reach the most depressed sectors of the economy, that in the majority of the cases represents the rural areas that are located far away from main cities. In this sense, this situation represent a challenge that could be follow with governmental support in the possibility to give better conditions to the lenders with the goal to consolidate the sector in such a way that the growth does not lead to crisis.

Many electrification programs took place in the past years through out the country; inside the selected research area since the 90s, two electrification phases took place, however with no significant impacts under the SMEs establishment or development, statement that is corroborated with the fact that in 32 communities visited only 22 SMEs were identified using electricity only for lighting and none of them used it for production activities.

These phases of rural electrification were developed and implemented under the criteria of equity, resulting in bringing to the people low voltage power lines that are not enough for the establishment of electrical machineries and consequently no productive sector with enterprises that use electricity only for lighting purposes. The used criteria of “all Bolivians have to have electricity” need complementary objectives in order to be achieved and to have sustainable long term impacts.

In this context, it is concluded that this criterion of electrification had positive impacts by increasing the quality of life in the electrified households. However, improvements did not come to all rural households because rural electrification was done under the basis of poor studies resulting, in the case of the research area, that the percentage of connections within the visited communities range from extreme cases of 0% to up to 80%. So with out the studies, the government did not realised that availability does not mean access, since people did not connect to the grid simply because of their high levels of poverty. Such low incomes should have been identified by previous electrification studies, so actions plans could have been planed to conquer this issue.

Thus, it is crucial in order to obtain the expected results of electrification, the development of reliable technical and social studies that together with micro finance schemes might reach the majority of the community homes. But this can only be feasible if it is not done under the umbrella of political promises

only. Meaning that in order to reach the rural SME establishment or development by electrification, other integrated measures should be taken into consideration such as infrastructure, access to market and three phase power lines instalment.

In this context of the importance of the Small and Micro enterprise and the situation of the Micro finance and the Electricity sectors in the country plus the extreme poverty that the population is facing leads to the necessity of programs for improving their living standards.

Another important remark is that the existence of small monopolies should be eliminated leading the final customer in better position for the up-take of electricity specially the rural poor people. In this context, with more accessible consumption rates and connection fees it is possible to have more people connected to the grid, since the research study found that in 100% of the non-connected SMEs the high connection fees represented their main constrain for accessing to electricity.

As consequence of the present research it was identify that the governments support to the rural SME is generally poor with the exception some donor, NGOs or Catholic Church involved projects with focal groups of only agricultural activities. Despite the effort done by these institutions supporting the agro for rural development, it is also important to start integrating projects that support the non-farming SMEs because of the identified job creation potential of such enterprises have specially in reaching women as entrepreneurs.

In order to analyze the energy situation of the SMEs in the research area and the role of alternative micro finance funds affecting this energy situation, it was observed that 19 of the interviewed enterprises were connected to the grid from which 17 started operations before the electricity arrived, so the electricity arrival has not brought the establishment of new enterprises in the research area.

It is also concluded that Micro finance is not the main factor for the up-take of electricity by SMEs, since 77% of the interviewed entrepreneurs expressed other priorities of investment such as improving the physical working place or having for sale the right amount of products. In this context, Micro finance is part of a group of factors, depending on the enterprise needs and priorities of investment that contributes to the mentioned up-take.

However, the fact that in 11 out of 22 enterprises the main household livelihood activity was not the enterprise itself, might be an explanation of why they do not have as a priority of investment to connect or use electricity for productive uses.

It is also important to mention that 17 of the interviewed SMEs were located inside the household operated by women with the objective to increase the household income (19 cases). So in the research area it tends to be women

who decide to start the enterprise and also their willingness to opt for a credit is higher than men. In this context it is recommended that micro finance mechanisms should have women as focal target groups.

In summary, evidence from the research sample does not support claims made that the electricity promotes the establishment of productive enterprises and that micro credits are a broadly an effective solution to the up-take of electricity by small and micro enterprises. Instead, electricity does not *per se* promote establishment of enterprises, this is as a result of the broader development of the town itself. The up-take of electricity in SMEs is influenced by a sum of factors (infrastructure, micro finance, type of activity, market, etc.) and not only with the availability of funds.

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Appendix

Appendix 1

About EASE Program [81]

1. Background

EASE - Enabling Access to Sustainable Energy started in 1999 with a one-year inception phase. During this phase, the foundation for the current program was laid.

The program leans on two strategies:

- to improve insights into the poverty situation and energy needs; and
- to promote the importance of energy and poverty issues to the national actors in developing countries and the international development community.

It is under the EASE conception that access to proper energy services will contribute to different aspects and at different levels, first at a household level, the access to improved cooking services will dramatically improve the indoor pollution and consequently improve the health of women and children specially. Second at the social infrastructure level, lighting, sterilization and refrigeration at clinics are essential for the treatment of ill people. These services cannot be provided without access to appropriate energy services.

Additionally, empowerment of the poor by means of modern information and communication tools such as telephone, television, radio and computers enable people to become better informed and thus more independent. It allows them for instance to educate themselves, to influence decision-making, to be informed on current price levels and to communicate with friends and family. These information and communication tools all depend on a reliable and affordable energy provision as well.

Most poor people currently meet the majority of their energy needs by collecting biomass (e.g. fuel wood, agricultural residues, and dung) for cooking and heating and by using additional resources like kerosene and batteries for lighting or radio. Generally, these types of resources cost a lot in terms of both time and money. Collection of biomass energy takes women and children between 2 and 7 hours a day, while kerosene and candles are often far more expensive than more modern energy services, like electricity. Access to reliable, modern energy services could therefore seriously reduce people's time and money spent on their energy needs.

Finally, energy is strongly linked to the environment. Energy sources are drawn directly from the environment and improper or inefficient energy use causes environmental problems. The conversion of biomass in cooking or lighting equipment is often very inefficient causing emissions of toxic materials and

[81] For further information about the Program please refer to www.ease-web.org

greenhouse gases. Furthermore, the poorest people often live in the most ecologically sensitive and vulnerable physical locations, which makes them even more vulnerable to environmental problems like deforestation, desertification and climate change.

2. Activities

According to the mentioned EASEs´ conception statements, the program has diverse activities in the countries of presence[82]:

a) International Activities

Three main activities of EASE at the international level can be distinguished:

1. Capacity Building National partner organizations can call upon the EASE Secretariat for support in carrying out their activities. This support will be tailor-made and its form will depend on the requirements of the partner organization. Examples of capacity building activities could be training, pilot project development support, or institutional strengthening. Furthermore, CERES is able to provide guidance with respect to the national research activities, where possible in cooperation with local universities within the CERES network.

2. Research at the international level existing methodologies of poverty impact assessments of energy projects will be analyzed and adapted for local use. The results of the local level research will be integrated into the development of 'energy and poverty investment protocols'. These protocols will ensure that new energy projects will be financially viable, attractive to an investor, and that it will lead to poverty alleviation at the local level. This research will be coordinated by CERES.

3. Information dissemination information about EASE will be disseminated mainly through this website and the international EASE newsletter. Papers and other information developed under EASE will be made available mainly in digital form. Upon request, however, the EASE Secretariat could make this information available in hard copy as well.

b) National Activities

At the national level field research will be implemented to map the local 'energy and poverty' situation. Poverty impact assessments of ongoing energy projects will be carried out to find and analyze energy project components that bring about poverty alleviation. Furthermore, energy investments will be analyzed to determine the investment behavior of local investors. EASE research activities will therefore include: organizing stakeholder workshops, interviews with stakeholders and literature reviews.

The results of the research will also be used for advocacy purposes. Stakeholders like local governments, investors and end-users are crucial factors in the success rate of a project. They need to be well-informed on the importance of energy services for poverty alleviation. One of the goals of the EASE program is to stimulate energy and poverty project development in the partner countries. Advocacy activities are therefore very important. These

[82] The EASE program is present working in: Bolivia, Tanzania and Vietnam.

activities will include: organization of stakeholder workshops and giving presentations at national conferences.

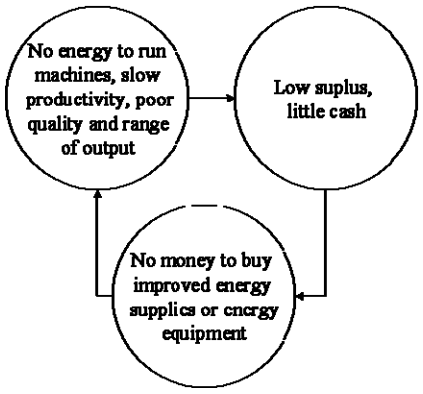
3. The Poverty Circle

The Small and Medium Enterprises are, families that are generally of low or very low income and do not have access to energy sources that are reliable, economic and permanent, situation that constrains the quality of live of this families and decreases their competitive conditions.

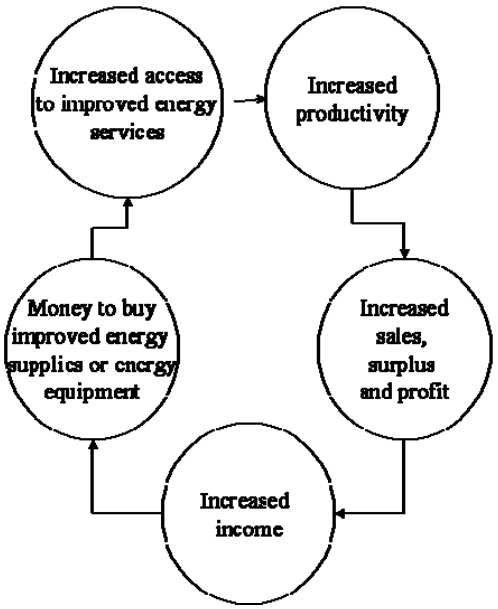
Thus, households[83] are often suffering from a vicious circle that traps the user in poverty (Figure 1.a). The circle break concentrates on productivity as the means to change the vicious into a virtuous circle, thus crediting productivity with a large poverty alleviating powers (Figure 1.b)

Figure 1
The Poverty Circle

a)



b)



In this context, accessing to modern energy for SMEs can finally help families to break this circle and have poverty alleviation connotation by increasing its productivity[84].

[83] It is understood for the present research that a most SMEs are based inside the household
[84] Reason of causality (energy – poverty) for the elaboration of the present research.

Appendix 2
Research Questions Table

		How they are answered?	Where are they answered?
Central question:			
	What is the role of micro finance in the up-take of electricity by small enterprises?	Analysis of the whole research findings and data gathering techniques	Section V: Conclusions
To investigate this area a sub questions will be answered during the present study:			
		Section I	
1	What does other researchers say about the energy - poverty relation under the SMEs perspective emphasizing in the role of Micro finance and why of their findings?	Literature review of the real experiences and theories related to the energy and enterprise relation.	Section I: Introduction
		Section II	
2	What is the SMEs situation in Bolivia and why the importance of studying them under a country perspective?	Literature review and analysis of National Official Statistical Data.	Section 2.1
3	How does the Micro finance sector in Bolivia works in terms of structure, actors and types of micro finance mechanisms offered to SMEs and why of its importance for the SMEs as sources of finance?	Literature review, experts interviews and analysis of the relation Micro Finance and SMEs in terms accessibility	Section 2.2: sub-sections 2.2.1, 2.2.2 and 3.1.3.2
3.1	What is the current situation of the MFIs in Bolivia under the micro credit micro finance source available for SMEs and why the importance of those funds for a SME?	Literature review, experts interviews and analysis of the relation Micro Finance and SMEs in terms accessibility	Sub-section 2.2.2
4	How does the Electricity sector in Bolivia works in terms of structure and actors and why these characteristics affect the SMEs decision of using grid electricity in the research area?	Literature review and analysis of the grid technical characteristics of the research area	Section 2.3
		Section III	
5	Which factors are necessary to combine with micro finance, and under which circumstances, to enable the up-take of electricity by small enterprises?	Analysis of all the results form the interviewed small enterprises, local authorities, experts and on site observation.	Section III
5.1	Which characteristics of the **enterprise** (including enterprise activity) play a role in sources of finance dedicated for investment and how do these characteristics influence the enterprise decision of up-taking electricity?	Analysis of all the results form the interviewed small enterprises and use of on site observations	Section 3.1.1
5.1.1	What is the current situation of the rural SMEs in electricity use and why of their situation?	Analysis of all the results form the interviewed small enterprises and use of on site observations	Section 3.1
5.1.2	How does the availability of those funds for the SMEs affects the enterprise activity?	Analysis of all the results form the interviewed small enterprises and use of on site observations	Section 3.1.3.2
5.2	Which characteristics of the **enterprise owner** play a role in the requirements and barriers for up-take of electricity and why they affect the micro finance source to be used for the mentioned up-take?	Analysis of all the results form the interviewed small enterprises and use of on site observations	Section 3.1.2
5.3	Which characteristics of the **environment and institutional context** play a role for choices to invest in electricity and sources of finance for investment in terms of:	Analysis of all the results form the interviewed small enterprises, local authorities, experts and on site observation.	Section 3.1.3
5.3.1	Why does the Utilities policy in terms of rates, quality and action plans affect the uptake of electricity by SMEs?	Analysis of all the results form the interviewed small enterprises and personnel from the Utility.	Section 3.1.3.1
5.3.2	For which types of investments are these finance sources used in small enterprises and why their priorities of investment?	Analysis of all the results form the interviewed small enterprises.	Section 3.1.3.2
5.3.3	What are the common finance sources used by SMEs and why their decisión of using one or the other available?	Analysis of all the results form the interviewed small enterprises and interviews with micro finance institutions.	Section 2.2.1.1, 2.2.1.2, 2.2.2 and 3.1.3.2
5.3.4	Why does market conditions affect the decision of up-take of electricity?	Analysis of all the results form the interviewed small enterprises.	Section 3.1.3.3
5.3.5	What is the current Governmental SME support?	Literature review and analysis of all the results form the interviewed small enterprises and personnel at governmental support projects.	Section 2.2.1.1
		Section IV	
1	What does other researchers say about the energy - poverty relation under the SMEs perspective emphasizing in the role of Micro finance and why of their findings?	Literature review and analysis of the current research findings. Comparison of statements made by other researches to the ones resulting from the present research	Section IV: Findings discussion

Source: Own elaboration

Appendix 3

Characteristics of the Research area

The research took place in the rural areas of the department of Cochabamba, the third most important department in the Country.

The department of Cochabamba has scenically a mountain landscape, because a branch of the Andes Oriental Cordillera passes it through. It is located in the centre of Bolivia and its capital: the city of Cochabamba is located at 2.558 meters high over the sea level.

It has a total population of 1.110.205 inhabitants (Census of 1992) and is located in the heart of the country. Because of it geographical conditions and been bigger than Holland with an extension of 55.631 Km.2. it has a variety of weather condition and long distances from one location to the other with bad quality roads.

Its economy is mainly dedicated to the agro-industrial activities; however because of the extreme poverty that rural areas are facing the migration to the main cities of rural people is phenomenon of expulsion rather that attraction.

It has different valleys located at different altitudes over the sea level, been the most important the Cochabamba, Sacaba, Valle Alto and Cliza. The department is politically divided in 16 provinces and 201 cantons, being its capital de province of Cercado.

Other Geographic zone of great importance is the Chapare region that is considered as one of the five regions in the world with the highest rain precipitations, with over 5.000 Mm per year.

The weather in the Department of Cochabamba varies with the altitude, cold in the peaks of the Cordillera, warm in the valleys of the south part of the Cordillera, cold to warm in the north of the Cordillera, hot to warm in the Yungas region, hot and tropical in the northwest (Chapare) and dry and hot in the south. The south east part is characterized by very dry and hot, that has a vegetation of cactus and xerophytes.

With an average of 10 degrees Celsius below zero and up to more that 24 degrees in the tropical areas, the variety of weather conditions give to agricultural production great versatility and has the advantage to have a great variety of flora and fauna.

Appendix 4

List of the Interviewed Communities

The present research includes 32 communities as shown in the following table:

Research communities

Number	COMMUNITY	Nr HH	Interview SME
1	Apilla Alta	92	
2	Churo	61	2
3	Kaluyo Grande	143	2
4	Molinos	82	
5	Tranca Kelamayu	37	
6	Cuevas	8	
7	Jaljatiri	36	1
8	Morochata	184	3
9	Ura Parangani	57	
10	Apharumani	36	1
11	Tunas Vinto	8	
12	Pongo	50	1
13	Ramadas	49	1
14	Tapacari	165	2
15	Arque	153	2
16	Chimboata	17	
17	Pisorga	27	1
18	Tumuyo	50	
19	Episana	152	2
20	Esquina	78	1
21	Jaboncillos	67	
22	Juzgado	30	
23	Mayra	55	
24	Tujma Baja	66	
25	Cauta	87	
26	Tin Tin	165	2
27	Vila Vila	151	1
28	Apillapa	15	
29	Ch'iara Khochi	48	
30	Mayola	55	
31	Pucaruma	43	
32	Sacabamba Alto	29	

Average Nr. of HH per interviewed community	104

Total Enterprises interviewed	22

Source: Energetica and Own

Appendix 5
Pre-structured Small and Micro Enterprise Interview

DATA GATHERING QUESTIONNAIRE
Responsible: Jaime Sologuren

Date	
Qu. No.	
Village	

Enterprise name

1.0 Respondent / Owners profile

1.1 Name of respondent **Sex** Female ☐ Male ☐

1.2 Position of the respondent in the enterprise **Sex** Female ☐ Male ☐

1.3 Name of the owner **Sex** Female ☐ Male ☐

1.4 Level of education of the respondent: None ☐ Primary not completed ☐ Primary completed ☐ Secondary school ☐ College/University ☐

1.5 Level of education of the owner: None ☐ Primary not completed ☐ Primary completed ☐ Secondary school ☐ College/University ☐

1.6 Members of the household of the owner of the enterprise:

	SPOUSE	CHILD 1	CHILD 2	CHILD 3	Attendant/labourer	Civil status
AGE						
SEX						
EDUCATION None						
Primary not completed						
Primary completed						
Secondary school						
College/University						
INCOMES None						
<450						
450-1000						
1000-1500						
>1500						

1.7 What sources of income dues the household has? Who contributes? Husband ☐ Spouse ☐ Child ☐ Other ☐

1.8 What are your priorities of expenditure?

Type of expenditure	Amount	Time

2.0 Enterprise profile

2.1 Nature of ownership: individual ☐ partnership ☐ Cooperative ☐ private limited company ☐ Others ☐

2.2 What kind of enterprise? ***Tick the most appropriate, if more activities, tick the one with greatest production value***

Barber shop/Hair salon ☐	Milk processing ☐	Grain milling ☐
Welding workshop ☐	Hotel/Restaurant ☐	Tailoring ☐
local beer/brewing ☐	Non food retail shop ☐	Bakery ☐
Food vendors ☐	Mining ☐	
Fertilizer shop ☐	mill ☐	
Concrete/Bricks workshop ☐	Battery charging ☐	
Mechanical/vehicle repair ☐	Transportation ☐	
Internet café/ communication centre ☐	Grocery/Bar ☐	
Others (mention)		

2.3 Who decided to start up the enterprise? Husband ☐ Wife ☐ Both ☐

2.4 Why did you decide to start up the ente Employment ☐ Income earning ☐ influence from relatives (wife, husband, etc) ☐ Others (specify……) ☐

2.5 Was availability of electricity a contributing factor for starting the enterprise?

YES	NO	DON'T APPLY

2.6 Which are other business ideas available and why this one was chosen?

Barber shop/Hair salon ☐	Milk processing ☐	Grain milling ☐
Welding workshop ☐	Hotel/Restaurant ☐	Tailoring ☐
local beer ☐	Non food retail shop ☐	Bakery ☐
Food vendors ☐	Mining ☐	☐
Fertilizer shop ☐	Oil extracting/mill ☐	☐
Concrete/Bricks workshop ☐	Battery charging ☐	☐
Mechanical/vehicle repair ☐	Transportation ☐	☐
Internet café/ communication centre ☐	Grocery/Bar ☐	☐

2.7 For how long has the enterprise been in operation? less than one year ☐ less than 2 years ☐ 2-5 years ☐ more than 5 years ☐

2.8 What is the number of employees

	Full time job equivalent		Part time/ casual labour	
	Family	External	Family	External
Total				
Males				
Females				

2.9 How much did it cost to start up the enterprise?

	Registration	Machines	Rent	Working capit	New materials
None					
<1000					
1000-3000					
3000-6000					
6000 >					

2.10 Seasonality of operation: ***if seasonal tick appropriate months***

Regular annual		Seasonal					
	January ☐		April ☐		July ☐		October ☐
Irregular Casual	February ☐		May ☐		August ☐		November ☐
	March ☐		June ☐		September ☐		December ☐

3.0 Enterprise location

3.1 Where is the enterprise loca Centrum ____ outside ____ distance in mt ____

3.2 Who owns the land where the enterprise is established? owner of the enterprise ____ village ____

4.0 Legal situation

4.1 Do you know the regulations that governs establishment of the enterprise? YES ____ NO ____

4.2 Legal status of the enterpris Registered ____

Informal ____ **Do you pay taxes** ____

5.0 Energy and the enterprise

5.1 Which energy sources does enterprise use? ***tick the most dominant, indicate units and consumption per month***

	Electronics (radio/TV,)	heating/ cooking	lighting	production	transport	units	consumption
Solar/Daylight							
Human/animal							
Animal/plant wastes							
Firewood							
Charcoal							
Coal							
Kerosene							
Petrol/diesel							
Gas (acetylene, oxygen, etc)							
Dry cell batteries							
Candles							
Car battery							
Solar PV system							
Solar Water Heater							
Grid electricity							
Diesel/petrol generator							

5.2 What equipments does the enterprise use

Equipment	Energy used	units	consumption

6.0 Electricity supply

6.1 How do you rate the quantity of the electricity? Sufficient ____ less than needed ____

capable to meet enterprise demand ____

6.2 How do you rate the quality of the electricity? Sufficient ____ less than needed ____

capable to meet enterprise demand ____

6.3 From where do you get you energy supply? village ____ other villages within the country ____

nearby town ____ Abroad ____

6.4 If there is no availability of the electricity how is your enterprise affected?

Machines and production/service stops ____ None ____

Other (explain) ____

7.0 Electricity uptake

7.1 Why you don't use electricity?

bureaucracy from the supply company ____ failure to meet the required connection standards ____

corruption ____ failure to pay monthly fees ____

materials/equipment ____ lack of nearby service provider ____

High connection fees ____ Other (……) ____

7.2 If an enterprise can not afford to acquire electricity, which schemes are there to assist?

None ____ credits ____ payment in instalments ____

government subsidy ____ Others (……) ____

7.3 Would you connect to the grid if there is the possibility of a source of money lending that you can a YES ____

if the answer is no please indicate why?…… NO ____

7.4 What has been the changes in the source of energy for:

	(radio/TV)	heating/ cooking	lighting	production	transport	Others
before (start)						
after (now)						

8.0 Enterprise Market

8.1 Which product/service do you produce?

No.	Products/Serv	Units	Average price Bs/unit	Quantity	Average number of customers
1					
2					
3					
4					

8.2 Where do you sell your products? in the village ____ other towns within the country ____

nearby town ____ Abroad ____

8.3 Who are your customers? children ____ Males ____ Females ____ All ____

8.4 What is your average income per month

<450 ____ 1000-1500 ____

450-1000 ____ >1500 ____

8.5 Which month do you get mc customers? January ____ April ____ July ____ Oct ____

February ____ May ____ August ____ Novem. ____

____ The whole year March ____ June ____ Sept ____ Dec. ____

8.6 What is the average production/services per month?

No.	Products/Serv	Units	Av.price	Quantity	Average number of customers
1					
2					
3					

9.0 Enterprise Microfinance

9.1 Who provided the financial capital to sta	Husband		Wife		Both	
the enterprise?	Others, specify……..		credit/loan		Relatives	

9.2 Did the enterprise borrow money over the last year

	YES	NO	Amount (Bs)
Banks, FFPs			
NGOs			
Relatives/Individuals			
Local credit institutions			

9.3 What have you used the loan for?

Re-investment - equipment		Repaying other loans		DO NOT APPLY	
improvement of the production facilities		Others (describe)			

9.4 Which type of credit institutions are willing to provide loans to such enterprise?

Credit/loan facilities		Banks		Local/Village institution	

9.5 Where do you get loan/lending services?

in the village		other towns within the country		
nearby town		Abroad		

9.6 Do you have plans to expand your business?

	YES	NO	Reason for yes/no
Re-investment - equipment			
Re-investment - building			
Re-investment - new materials			
Re-investment - training			
Marketing and promotion			

9.7 What are the major expenditures you have done from the profit of the enterprise? Indicate

Car/motorcycle		Sheep/Goat		Table/Chair/Bed/Mattresses	
Raw material		Others (mention)		Household utensils	
Bicycle		Chicken/duck		Land (acres)	
Clean water		Radio/Torch		SAVINGS	
Cattle		Energy sources		Which?	

9.8 What are your priorities of investment?

Car/motorcycle		Sheep/Goat		Table/Chair/Bed/Mattresses	
Raw material		Others (mention)		Household utensils	
Bicycle		Chicken/duck		Land (acres)	
Clean water		Radio/Torch		SAVINGS	
Cattle		Energy sources		Which?	

10.0 Other

10.1 As an entrepreneur what are your three priorities among the following: (*rank three responses)*

Access to credits		Improvement in water supply		Electricity	
Stable political environment		Good roads/infrastructure		Better opportunities for women	
		Improvement in education		Better health care services	

10.2 How do the village community benefit from your enterprise?

employment		they get knowledge/education/information	
they get services/products in the village		None	
they get training		Others	

10.3 How does the Social and political situation affect the enterprise?

General comments/remarks of the respondent:

Source: TATEDO interview.

Appendix 6
The Energy Sector in Bolivia

During the past years, this sector in Bolivia has characterized as one of the most dynamic ones, in terms of investments, development and importance for the economy.

This sector was also the sector that had the most important reforms, not only in its institutional level but also in the regulatory level, due to being first a sector administrated by public agents and then by private ones; passing of being a state monopoly to a disintegrated sector commanded by market principles.

Because of the importance for the present research only the electricity sector is explained next in order to give the general circumstances that the research conclusions are based.

1. The Electricity Sector

In Bolivia, three climatic zones are distinguished: the Andes, the Valleys and the Llanos. The Andes zone is characterized with its cold weather and high altitudes over the sea level. This zone is cut with by the Andes chain of mountains, that is formed of high mountains and snow peaks, becoming a great source of hydro resources, that are used in hydro turbines in plants that are operated by companies as CORANI, COBEE, RIO ELECTRICO, HIDROELÉCTRICA BOLIVIANA, SYNERGIA, and SETAR (Isolated system) for the electrical generation.

Likewise, the Valley and Llanos zones are characterized by their tropical weather and low altitudes that are rich in Fossil Fuel reserves (Natural Gas and Oil) form which and with the use of turbines run by gas or electrogeneous groups, electricity is generated. Thermo central plants are run by companies such as VALLE HERMOSO, GUARACACHI, COBEE, CECBB that are part of the National Interconnected System (SIN), and ENDE, CRE, SETAR, GENERGYS, Cooperatives and Auto-producers classified as isolated systems in some locations of the country.

The existence of the primary energetic resources; the presence of a growing internal demand perspective; the potential demand of the Brazilian electric market and the possible interconnection and integration of the regional markets, determine interesting perspectives of grow in the future.

In this context, the conditions that the country offers for the investments in the electric sector suits the requirements of safety, profitability and potential grow of private investments. The existence of a modern and stable sectored legal framework, conformed by the SIRESE Law, the Electricity Law and an Independent Regulator (CDND) gives security to the investors.

1.1 Structure of the sector

The Electric Industry in Bolivia consists in the generation, transmission, distribution, commerce, import and exports of electricity. The new structure of the sector determines the vertical separation of activities of generation, transmission and distribution in the National Interconnected System (SIN), with the objective to promote and correct functioning of a competitive Major Electric Market (MEM), where the supply is constituted by the generators and the demand is constituted by the distributors and the non regulated consumers.

The supply of the electricity in Bolivia is based in hydroelectric and thermoelectric generation centrals. The total installed power at a national level (Dec. 2003) is equal to 1'353. 3 MW.

1.1.1 The Major Electric Market

The Major Electric Market (MEM) is the market conformed by generators, distributors, tansmisors and non-regulated consumers that buy, sell and transport electricity.

The administration of the MEM is under the responsibility National Committee of Load Dispatch (CNDC) that because of dispositions of the Electricity Law has the job of doing the integrated operation of the SIN with the objective of satisfying the demand by a safety, reliable and low cost operations in real time.

The buying and selling of electricity in the MEM can be done through contracts or in the "Spot market" in where the transactions are done under the bases of prices that are set every hour. The exchange of energy and power is done in the injections nodes and/or retirement of the Troncal System of Interconnection (STI), to which are connected the different agents that participate in the energy and power transactions in the Major market.

1.1.2 National Interconnected System (SIN)

The Electricity Law defines the distribution of as the activity of supply of electricity to the consumers through primary and secondary installations. The activity of distribution constitutes a public service and for it is required a "concession" that gives to the company the right of operation in a designated geographical area, in where it is establish a retail electricity market.

In Bolivia the distribution systems are integrated to the National Interconnected System (SIN). The companies settled in the main departmental cities are: in La Paz is ELECTROPAZ S.A., in Oruro is ELFEO S.A., in Cochabamba is ELFEC S.A., in Santa Cruz is CRE Ltda., and in Chuquisaca and Potosi is CESSA S.A. and SEPSA S.A., respectively[85].

[85] All the acronyms are related to its original names in Spanish:
- ELECTROPAZ: Electricidad de La Paz.

Additionally, it is important to mention that the SIN also covers some rural areas of the country, for example the company EDEL S.A. that covers the provinces of Larecaja, Sud Yungas and Caranavi; or EMPRELPAZ S.A that supplies electricity to the provinces Camacho, Larecaja, Omasuyos, Manco Kapac, Los Andes, Murillo, Ingavi, Aroma, Pacajes and Manuel Pando and the company SEYSA S.A for the provinces of Nor and Sud Yungas; all of them located in the Department of La Paz.

The distributors simultaneously participate in the market as buying agents from the generators and in the Retail market as sellers of electricity to the final consumers (i.e. Households)

With use of the numbers presented by the Superintendence of Electricity, in 2003 the sales made by the six companies in the SIN in the departmental capital cities was 3.025,79 GWh, from where 36,59 % is concentrated in Santa Cruz, 30,89 % in La Paz, 19,64 % in Cochabamba, 6,42 % in Oruro, 3,72 % in Chuquisaca and 2,73 % in Potosí.

The own characteristics of each region and the potentialities that they possess determine the growing perspectives of the sales, therefore, each company presents different behaviour in comparison with the previous years. In these sense, some companies experience losses and some profits.

1.1.3 Isolated Systems (SA)

The Isolated Systems (SA) are mainly constituted by vertically integrated systems that have no connection to the SIN and that are in charge of companies or cooperatives among we can mention ENDE RESIDUAL located in the cities of Trinidad and Cobija, CRE Ltda. (SA) that works in the rural areas of the department of Santa Cruz and the plants that are located in the department of Tarija that are run by de company SETAR S.A.

1.2 The Actors

In this context, on one hand, the actors in the electricity generation inside the SIN is in charge of the following companies: CORANI, GUARACACHI, VALLE HERMOSO, COBEE, RÍO ELÉCTRICO, HIDROELÉCTRICA BOLIVIANA, SYNERGIA and CECBB, that offer their production to the Major Electrical Market (MEM). This companies generated 3 790 GWh of the total produced energy in Bolivia.

On the other hand, the production of the Isolated systems is in charge mainly by three companies: ENDE with plants in the departments of Beni (Trinidad y Moxos) and Pando (Cobija); SETAR in the department of Tarija (Tarija, Bermejo, Yacuiba, Entre Ríos, El Puente and Villamontes), and CRE that runs

- ELFEO: Empresa de Luz y Fuerza de Oruro.
- ELFEC: Empresa de Luz y Fuerza de Cochabamba.
- CRE: Cooperativa Rural de Electrificación.
- CESSA: Compañía Eléctrica Sucre S.A.
- SEPSA: Servicios Eléctricos Potosí.

five insolated systems in the department of Santa Cruz. Besides these three companies inside the country there are Cooperatives and Auto producers that cover theirs electricity demands with their own generation equipments.

The electricity demand is formed by the distributors (CRE, ELECTROPAZ, ELFEC, ELFEO and CESSA) that are connected to the SIN and the insolated systems (SETAR, ENDE-Cobija and COSERELEC). In the 2003 the demand of the SIN connected distributors was 3'225,0 GWh while the insolated systems demanded 468,7 GWh [86]

The Superintendence of electricity is one of the main actors of the Electrical sector. This institution is in charge of the Regulation of the activities of the Electricity Industry and forms part of the Sectored Regulation System (SIRESE).

The main functions of the Superintendence of Electricity are:

- Protect the right of the consumers
- Give concessions and operating permits.
- Approve and control prices and tariffs.
- Supervise the functioning of the National Committee of the Charge
- Apply sanctions

Last but not least, is the Vice-ministry of Electricity that is part of the Central Government and under the command of the Ministry of Energy explained in the previous subhead of section 2.3.

[86] www.superele.gov.bo

Appendix 7
Interview Summary

Date	04-Jul-05	04-Jul-05	04-Jul-05	04-Jul-05	05-Jul-05	05-Jul-05	05-Jul-05	05-Jul-05	06-Jul-05	06-Jul-05	06-Jul-05	06-Jul-05	06-Jul-05	08-Jul-05	08-Jul-05	08-Jul-05	08-Jul-05	08-Jul-05	08-Jul-05	09-Jul-05	09-Jul-05	09-Jul-05
Municipality	Sacaba				Morochata				Tapacari					Arque		Pacha Mayu	Episana		Esquina	Tin Tin		Vila Vila
Community	Churo		Kaluyo Chico	Kaluyo Grande	Jaljatiri	Morochata			Apharumini	Pongo	Ramadas	Tapacari		Arque		Pacha Mayu	Episana		Esquina	Tin Tin		Vila Vila
1.0 Respondent profile	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1.1	Grocery Store	Grocery Store	Grocery Store	Grocery Store (Nely Ana)	Criadero de Truchas (Claudia)	Bar pension Rosedal (Roberto)	Grocery Store (Elena Ovando)	Communication Centre (Eugenia)	Cloth Manufacture (Margarita de la Fuente)	Cloth Manufacture (Maria)	Wheat mill (Roberto Ribas)	Wheat mill (Ramiro Ontiveros)	Kiosco (Maria)	Pension Doña Gaby (Eleuterio Vasquez)	Grocery Store (Margarita Delgadillo)	Funerary Services San Luis (Severino Heredia)	Tech. Service (Elvis Onorio)	Tyre repair shop (Herman Villarroel)	Chicheria (Justina Garcia)	Grocery Store (Marcela Quevedo)	Communication Centre (Casto terrazas)	Hostel Blanquita (Victor Claros)
1.2	Owner	Owner	Owner	Daughter of Owner	Daughter of administrator	Owner	Owners Friend	Employee	Wife of the Owner	Owner	Owner	Owner	Owner	Owner	Owner	Owner	Son in law	Son of the Owner	Owner	Daughter in Law	Owner	Employee
1.3	Benito Hernandez	Angel	Abel Corrales	Apolinar	Mr. Fernandez Barberry	Roberto	Elena Ovando		Emilio Torrez	Maria	Roberto Ribs	Ramiro Antiheros	Maria	Elaterid Vasquez	Margarita Deltaville	Severino Heredia	Cristina Amman	Cyprian Villarroel	Justina Garcia	Matilde Salazar de Vega	Casto Terrazas	Elmer Marañon
	Male	Male	Male	Female	Female	Male	Female	Female	Female	Female	Male	Male	Female	Female	Female	Male	Male	Male	Female	Female	Male	Male
1.4	Primary not completed	Primary not completed	Primary not completed	Primary completed	Primary not completed	Secondary School	Primary completed	Secondary School	Primary completed	Primary not completed	Primary not completed	Secondary School	None	Secondary School	Primary completed	Primary not completed	Secondary School	Secondary School	None	Secondary School	Primary completed	Secondary School
1.5	Primary not completed	Primary not completed	Primary not completed	Primary completed	No answer	Secondary School	Primary completed	Secondary School	Primary completed	Primary not completed	Primary not completed	Secondary School	Primary not completed	Secondary School	Primary completed	Primary not completed	Primary not completed	Primary not completed	None	Primary not completed	Primary completed	Secondary School
1.6		7 sons (4M - 3H)	2 sons		No answer	None	5 sons	No answer		5 sons (Primary not completed 5M)	5 sons (Primary not completed)	4 sons (Primary not completed)	7 sons (Primary not completed)	3 sons (Primary not completed)	5 sons (Secondary School)	5 sons (Secondary School)	4 sons (Primary not completed)	10 sons (Secondary School	3 sons (Secondary School)	2 sons (University / Technician)	1 son (Secondary School)	
1.7	Agriculture - All the family members	Agriculture - All the family members	Agriculture - All the family members	Agriculture - All the family members	No answer	Transport	None	Nurse	Community leader - Husband	Agriculture - Husband and production of "Chicha" - Wife	Agriculture - All the family members	Agriculture - All the family members	Agriculture - Husband	Church services - Husband		Agriculture - Husband e sons	Business - Son	Transport and lands	None	Agriculture - Peanut Commerce	Agriculture	Travel Agency in the City of Cochabamba
1.8	Products for sale	Agricultural Fertilizer (3000 U$ per year)	Raw Material for the fields	Products for sale	No answer	Physical infrastructure	To the sons	No answer	Food security	Food security	Raw material	Diesel for the mill motor	Products for sale	Physical infrastructure have rooms for rent as a hostal	Raw material	Physical infrastructure	Physical infrastructure in other towns	Raw material	Raw material for the production of "Chicha"	Raw material	Physical infrastructure	Physical infrastructure
2.0 Enterprise Profile																						
2.1	Individual	Individual	Individual	Individual	partnership	Individual	Individual	partnership	Individual	Individual	Individual	Individual	Individual	Individual	Individual	Individual	Individual	partnership	Individual	Individual	partnership	Individual
2.2	Grocery Store	Grocery Store	Grocery Store	Grocery Store	Criadero de truchas	Hotel/restaurant	Grocery Store and restaurant	Communication Centre	Cloth Manufacture	Cloth Manufacture and "Chicha" production	Mill	Mill	Grocery Store	Hotel and restaurant	Grocery Store	Funerary Services	Tech. Services	Tyre repair shop	Alcohol Distilleries ("Chicha" production)	Grocery Store	Communication Centre	Hotel/Restaurant
2.3	Wife	Wife	Both	Wife	No answer	Both	Wife	Wife	Wife	Wife	Husband	Husband	Wife	Both	Wife	Husband	Husband	Husband	Wife	Both	Husband	Husband
2.4	Employment (Wife)	Income earning	Income earning	Increase de Income y	No answer	Increase de Income y	Increase de Income	Increase de Income y	Increase de Income	Increase de Income	Increase de Income y	Increase de Income	Increase de Income	Increase de Income y	Employment of the wife	Increase de Income y	Increase de Income	Increase de Income	Increase de Income	Increase de Income	Increase de Income y	Increase de Income
2.5	No	No	No	Yes	No	No	No	Yes	No	No	No	No	No	No	No	No	Yes	Yes	No	No	Yes	No
2.6	No answer	Grocery Store	No answer	No answer	No answer	No answer	Grocery Store	No answer	No answer	No answer	No answer	No answer	Grocery Store	No answer	No answer	No answer	No answer	No answer	No answer	No answer	No answer	No answer
2.7	<1 year	<2 years	<2 years	2-5 years	>5 years	2-5 years	Grocery Store	>5 years	>5 years	>5 years	<1 year	>5 years (30 years)	<I year	2-5 years	>5 years	<1 year	2-5 years	2-5 years	>5 years (35 years)	>5 years	>5 years	2-5 years
2.8	1 - Family	1 - Wife	Husband and Wife	Family (4M - 1H)	External (1H y 1M)	Family (Husband y Wife) External (2M)	Family (Owner) External (Friend)	External (1M)	Family (1M)	Family (5M)	Family (1H)	Family (1H) External (2H)	Family (1M)	Family (1M) and external (1M)	Family (1M)	Family (1H) and external (2H part time)	Family (1H)	Family (2H)	Family (1H 3M)	Family (1M) and external (2M)	Family (2M)	External (1H 1M)
2.9	1000 - 3000 BS	3000 - 6000 BS	<1000 BS	No answer	No answer	1000 BS - 3000 BS	No answer	No answer	2300 Bs	1800 Bs	No answer	No answer	2400 BS	Connection 1200 Bs plus internal connection	Connection 1300 Bs plus internal connection	No answer	2000 BS	No answer	No answer	No answer	No answer	No answer
2.10.	Irregular	year round	year round	year round	year round	year round	year round	year round	Irregular	Jun, Jul, Ago, Sept	year round	year round	year round	Feb., mar, apr, may, jun, ago, sept, oct, nov	year round	Irregular	year round	year round	Irregular	year round	year round	year round
3.0 Enterprise location																						
3.1	Centrum	Centrum	Centrum	Centrum	Outside	Centrum	Centrum	Centrum	Centrum	Centrum	Centrum	Outside (400 mts)	Centrum	Centrum	Centrum	Centrum	Centrum	Centrum	Centrum	Centrum	Centrum	Centrum
3.2	Owner	Owner	Owner	Owner	Owner	Owner	Owner	Others	Owner	Owner	Owner	Owner	Others (plaza)	Owner	Owner	Owner	Aunt	Rent	Owner	Owner	Owner	Owner
4.0 Enterprise legal situation																						
4.1	No	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes	No	No	No
4.2	Informal	Informal	Informal	Informal	Registered	Informal	Registered	Registered	Informal	Informal	Informal	Registered	Informal	Registered	Informal	Informal	Informal	Informal	Registered	Informal	Informal	Informal
5.0 Energy and the enterprise																						
5.1	Grid (lighting)	Grid (radio, lighting)	Grid (radio, lighting)	Grid lighting)	Grid (Radio, lighting)	Grid (TV, radio, DVD, lighting)	Grid (radio TV lighting)	Grid (lighting) Solar PV (telephone)	Candles (lighting) y human (production)	Humana (Cloth Manufacture) and Grid (lighting, radio, TV, video)	Grid (radio, lighting) Gasoline (Production)	Grid (Radio,TV,lighting) and Diesel (production)	Candles (lighting)	Grid (Radio, TV, lighting) Gas (production)	Grid (lighting)	Candles (lighting) and wood (coking)	Grid (radio, TV, lighting)	Grid	Grid (lighting)	Grid (radio, TV, refrigerator, lighting)	Grid (lighting)	Grid (TV, radio, lighting) solar (heating water)
5.2		Radio	Radio	Radio, TV and video	Radio	Radio, TV, DVD, refrigerator	Radio, TV, refrigerator	Communication Equipment	No answer	TV, Radio	Radio, Mill	Radio, TV, Diesel Motor Mill	No answer	Radio, TV	No answer	No answer	Electronically equipment, radio TV	Compressor, other equipment	Radio	Radio, TV, refrigerator	Communication equipments	No answer
6.0 Electricity Supply																						
6.1	sufficient	sufficient	sufficient	sufficient	sufficient	sufficient	sufficient	sufficient	No answer	sufficient	sufficient	sufficient	No answer	sufficient	sufficient	No answer	sufficient	sufficient	sufficient	sufficient	sufficient	sufficient
6.2	sufficient	sufficient	sufficient	sufficient	sufficient	sufficient	Satisfies my demand	sufficient	No answer	sufficient	sufficient	sufficient	No answer	Satisfies my demand	Satisfies my demand	No answer	sufficient	sufficient	sufficient	sufficient	sufficient	sufficient
6.3	Grid	Grid	Grid	Grid	Grid	Grid	Grid	Grid	No answer	Grid	Grid	Grid	No answer	Grid	Grid	No answer	Grid	Grid	Grid	Grid	Grid	Grid
6.4	Stop activities	Not possible to work during the night	None	Not possible to work during the night	None	Stop activities	Might stop	Stop activities	No answer	None	None	None	None	Stop activities	None	No answer	Stop activities	Stop activities	Stop activities	None	Stop activities	None
7.0 Electricity Uptake																						
7.1	Grid connected	Grid connected	Grid connected	Sometimes they cut the supply	Grid connected	Grid connected	Grid connected	Grid connected	High connection costs	Grid connected	Grid connected	Grid connected	High connection costs	Grid connected	Grid connected	Don't need and high connection costs	Grid connected	Grid connected	Grid connected	Grid connected	Grid connected	Grid connected
7.2	None	Payments for instalment	None	The community association can help	Credits	None	None	Payments for the instalment	None	None	None	None	None	None	None	Don't care	None	None	None	None	None	None
7.3	No	No	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No	No	No
7.4		Always used Grid electricity	Paid 400 Bs for the connection and pays 25 - 30 Bs per month.		15 Bs per month	180 Bs per moth		25-30 Bs per month	5 Bs per month	20 - 22 Bs per moth	20 - 25 Bs per month	40 - 50 Bs per month		60 - 70 Bs per month	38 Bs per month		140 Bs per month	300 - 350 Bs per month	75 Bs per month	170 Bs per month	18 - 25 Bs per month	40 Bs per month

8.0 Market																						
8.1	Various	Various	Various	Various	Fish	Food vendors	Various	Call Centre Service	Textiles	Textiles and Alcoholic Beverage (Chicha)	Wheat flour	Wheat flour	Various	Food vendors	Various	Funerary services	Various	Various	Alcoholic beverages (Chicha)	Various	Communication Services	Hostel
8.2	In the village	In the village	In the village	In the village	Nearby town	In the village	In the village	In the village	Other villages	In the village, nearby town and Other villages	In the village and other villages	In the village and other villages	In the village	In the village	In the village	In the village and other villages	In the village, nearby town and Other villages	In the village	In the village	In the village	In the village	In the village
8.3	All	All	All	All	All	All	All	All	Women	Women (cloths) and Men (Chicha)	Women and men that is used to make breads or "chicha"	Women and men that is used to make breads or "chicha"	All	All	All	All	All	Men	Men	All	All	All
8.4	<450	<450 (50 bs)	<450	<450 (100-150)	<450	>1500 (2000)	NS	>1500 (3000 - 4000)	80 Bs	<450 (150)	<450	1000 - 1500	<450 (100 -80 Bs)	1000-1500	<450 (200 Bs)	<450	450 -1000	450 -1000	<450	450 - 1000	<450	<450
8.5	Year round	Year round	Year round	Year round	Year round	Sept, Oct y Nov	Year round	Year round	Year round	Jun, Jul, Ago, Sept	Year round	Year round	Year round	Feb., mar, abr, may, jun, ago, sept, oct, nov	Year round	Irregular	Year round	Year round	Year round	Year round	Year round	Year round
9.0 Micro finance																						
9.1	Husband	Husband	Husband	Husband and relatives	No answer	Both	Wife	Wife	Husband	No answer	Both	Relatives	Both	Husband	Relatives	Husband	Savings	Husband and Relatives	Wife	Both	Relatives	Husband
9.2	No	No	No	Yes	No answer	No	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes (Cooperative)	No	No answer
9.3				Enterprise establishment														Equipment Instalment	Improves in the production place	Product for sale		
9.4				Local Institutions		FFPs					Local Unions								Banco Crecer	FFPs		
9.5				Local Union		Community					Community									Nearby town		
9.6	Re-investment - building	Marketing and promotion	Re-investment - new materials	Re-investment - building		Re-investment - building		NS	No	Marketing and promotion	No	Marketing and promotion	Re-investment - equipment		Re-investment - equipment		Re-investment - equipment		Re-investment - building	Re-investment - No	No	Re-investment - building
9.7								Electricity		Gas	Gasoline	Diesel	Products	Raw material	Electricity			Electricity				
9.8	Raw material (merchandise for the Grocery Store)	Establish the market for the community	Raw material (merchandise for the Grocery Store)			Better infrastructure of the business	Buy merchandise for the store			NS	Raw material	Electric engine	First to fill up the shelves and then connect to electricity	Business infrastructure			Investment in equipments and open his business in other towns		Raw material	Buy merchandise	Potato seeds	Finish the constructions (rooms)
10.0 Other																						
10.1	Access to credit	Access to credit	Access to credit	Education		Political Stability	Better heath services	Education	Infrastructure/roads	Education	Infrastructure/roads	Education	Infrastructure/roads	Political stability	Electricity (Public lighting)	Infrastructure/roads	Education	Better opportunities to women	Access to credit	Better heath services	Infrastructure/roads	Education
	Infrastructure/roads	Trainig	Infrastructure/roads	Politiccal Stability		Infrastructure/roads	Education	Electricity	Electricity	Electricity	Electricity	Infrastructure/roads	Electricity	Infrastructure/roads	Infrastructure/roads	Education	Better heath services	Electricity	Infrastructure/roads	Education	Education	Better heath services
	Training	Infrastructure/roads	Political Stability	Infrastructure/roads		Better heath services	Infrastructure/roads		Better opportunities to women	Gas	Education	Electricity	Access to credit	Education	Better opportunities to women		Electricity	Political stability	Education	Infrastructure/roads	Better heath services	Political stability
10.2						Employment		Get products and services				Employment	Get products and services	Get products and services	Get products and services	Get products and services	Get products and services	Get products and services	Get products and services	Get products and services	Get products and services	Get products and services
						Get products and services						Get products and services										
						Get training																
Comments																						
1	They are be interested in connecting their kiosk with light if there is some credit, where they can pay it in monthly payments but they only have income from agricultural activities with a 4 month period between each harvest season. (May and August)	The respondent is in charge of the establishment of the market for the zone. He is working now with an NGO called "Paz" (Peace) and the municipality of Sacaba.	The future plans are only to stay with the current grocery store	Their campaign is that ELFEC is to inflexible, because if they do not pay one moth ELFEC removes the metter.	was establish 20 years ago when the government had the policy of support to rural areas with the State Bank. 5 years ago it was bought by the actual owners that were employee of the Unit of development of the State Bank and reactivated because for a long tine wasn't working.	There is some sort of association but the affiliation fee is 250 Usd so they are no interested be use they said that they don't do anything, only for agricultural activities	He only earn enough to support the sons and the wife. They life with what they earn per day.		The roads are the main problem because during the rainy season the community stays practically isolated (No truck comes).	She would like micro credit but only for the improvements in the production and for a better physical space of the enterprise. She is willing to get a credit but her husband wont let her do it	No micro finance system is available in the community or the communities nearby	The local office of the Utility in the town never works and they have to travel to Cochabamba for in order to pay the bill. With consequently costs in money and in time.	She would like to have light for the night, a blender and also a refrigerator.	They were interested but since the mining is low they are not anymore. Waiting the mining in the zone gets better and maybe they will be interested in expanding his business.	The younger members study in Cochabamba	He doesn't believe in the banks	He migrated from the city to the town because the demand of his services there.	They also have a micro hydro plant that was installed before the grid electricity came. So they mostly use the Hydro electricity and are connected to the grid only for emergencies	In the beginning the connection was 200 USD and now is 100Usd.	High migration of the younger members of the community outside the country	The business was from the father that passed away	ELFEC gave the community the possibility to connect to the grid the possibility of micro credit (1 year)
2	Feels a little bit afraid of the formal credit because of the interests.	They would like to put a metter per kiosk in the market but they would like to pay the fees under the credit of ELFEC not the bank because they say that the bank always takes everything form you. They want a 1 year credit.	They just invested in their new house (1 month ago)		This interview had to many much missing information because the owners lived in the city of cochabamba and they were not in the location. A too young girl was interviewed. Not considered valid.	His land is very small they only produce per year 250 Usd, so they started the business	The sales are different depending the day (Sunday is higher)			of a micro credit is available the women will the willing to access to it but they express that what they will be more interested in getting is training before money, so they can use it better. The decision of getting the credit relies in the husband.	Not willing to get a credit for nothing, he doesn't believe in credits because the bank takes all your money if you cant pay	He mention that it is important that the Government should put more power to the grid (Triphasic) because the current power is not enough for productive activities	She would like to work during the night but she cant because she only have candles	ELFEC took too long for the connections (TOO much bureaucracy)	They work their own business	If the possibility of a direct micro finance system can be available maybe he would like to access but not with the banks	High bureaucracy of ELFEC (people have to go to Cochabamba to do everything, which takes time and money.	National Grid Connection fees.(700 - 800 bs) Local Hydro plant connection fee (150 Bs)	The interests in the bank are too high so there are not interested in accessing for it	There priority of investment is raw materials. This means if they have some sort of access to micro credit they would invest it in that.	The monthly rates have increased lately and they do not have any idea of that	many houses are not connected because they expressed their willingness too late, now ELFEC is demanding at least 10 households, so they will go and connect
3	For him it is more important to receive training in agricultural improvements matters than the money for the electricity	At a HH level it is estimated that only 20% of them where connected to the grid.	They paid cash for the connection						Some weakness was detected among the local leaders but there still a great dependence of the villagers to the decisión the leaders make		His home has not light			They don't want micro credit, they believe that saving is better	ELFEC took too long for the connections (TOO much bureaucracy)	They said that the funerary doesn't need electricity so it is not connected but the Household uses electricity.	The Utility company doesn't want to install any metters if there are a few people	The hydro plant doest not work during the draught periods				The presence of a MFI in the community will be interesting since the fact that they have one to go they have to travel to the next community conditions them for the possibility to access to funds
4	The community has triphasic connection No productive SMEs despite the Triphasic power	The community has triphasic connection. No productive SMEs despite the Triphasic power									They are afraid to connect to the gird because they do not have money to pay the monthly consumption fees				They had a bad experience with a credit from, the bank. The bank took everything form one relative, so they are not interested in that finance option	No financial assistance available for the community	Micro credit OK, but only for improvements in the physical enterprise	The consumption fees of the hydro plant electricity are lower				They are not interested in a loan fro the connection but for the establishment of a business itself
5		The fact that they have to go and pay the electricity bills to Sacaba, generates to them additional travel expenses in money and in time.									The income is only for subsistence				They are waiting the sons to finish study so they will help with the Household expenses	High migration of local people to the city	He said that there are a lot of persons that are willing to access to a credit but the inexistence of a subsidiary of the MFI it is a barrier for them because of the distance that they need to travel.				The respondent expressed that he think the community is better with the electricity.
		They are paying for public lighting even if the community has no bulb working									The local leaders do not pay attention to the needs of poor people because they do not have money					The people in the village doesn't really see the benefits of the electricity						
		The connection fee is to high for some to connect. (850 bs)									The catholic church is the only support they have					They said that the most important factor for the establishment of an enterprise is not the electricity but the trainings						
		They realized that they have to add to the connection fees the indoor connection costs, they know that even it is not too high it represent something that has to be added									Because the house is not located in the main street of the village they don't like the idea to establish a store. If they will connect to the grid will be only for light to get to the bed											