

**Socio-Economic Contribution of Rural Electrification in SNNPR:
The Case of Sidama Zone**

A THESIS

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fulfillment of the requirements for Master of Arts degree in Rural
Development**

By

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Annexure I

DECLARATION

I hereby declare that the Dissertation entitled SOCIO-ECONOMIC CONTRIBUTION OF RURAL ELECTRIFICATION IN SNNPR: THE CASE OF SIDAMA ZONE, ETHIOPIA, Submitted by me for the partial fulfillment of the M.A. in Rural Development to Indira Gandhi national Open University, (IGNOU) New Delhi is my own original work and has not been submitted earlier either to IGNOU or to any other institutions for the fulfillment of the requirement for any course of study. I also declare that no chapter of this manuscript in whole or in part is lifted and incorporated in this report from any earlier work done by me or others.

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Annexure II

CERTIFICATION

This is to certify that Mr./Miss/Mrs-----
student of M.A.(RD) from Indira Gandhi National Open University, New Delhi was
working under my supervision and guidance for his/her project Work for the
Course MRDP-001.His/Her project Work entitled-----

Which he/she is submitting, is his/her genuine and original work.

Place:

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Signature

Name

Address of the supervisor

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| Table of Contents | Pages |
|--|--------------|
| 1. Introduction ----- | 1 |
| 1.1. Background----- | 1 |
| 1.2. Statement of the problem----- | 3 |
| 1.3. Objectives of the study----- | 4 |
| 1.4. Scope of the study----- | 4 |
| 2. Literature Review----- | 5 |
| 2.1. Benefits of Rural Electrification in Socio-economic Development----- | 7 |
| 2.1.1. Benefits of Rural Electrification in Economic Development----- | 15 |
| 2.1.2. Benefits of Rural Electrification in Social Development----- | 16 |
| 2.2. Rural Electrification and Rural Development----- | 17 |
| 2.3. Rural Electrification for poverty alleviation----- | 18 |

| | |
|---|----|
| 2.3.1. Rural Electrification and the MDG in Ethiopia----- | 19 |
| 2.3.2. The Plan for Accelerated and Sustained Development to End Poverty/PASDEP/----- | 20 |
| 2.4. Electrification by Region----- | 21 |
| 3. Methodology----- | 24 |
| 3.1. Socio-economic profile of Sidama Zone----- | 24 |
| 3.1.1. Physical Background ----- | 24 |
| 3.1.1.1. Location, Area and Administrative Divisions----- | 24 |
| 3.2. Population size----- | 24 |
| 3.2.1. Demographic characteristics ----- | 24 |
| 3.2. 2. Population Distribution----- | 25 |
| 3.2.3. Population Growth----- | 25 |
| 3.3. Economic Sectors----- | 25 |
| 3.3.1. Agriculture----- | 25 |
| 3.3.1.1. Crop production----- | 25 |
| 3.4. Sampling Techniques----- | 26 |

| | |
|--|-----------|
| 3.5. Data Collection ----- | 27 |
| 3.5.1. Tools for data collection ----- | 27 |
| 4. Results and Discussion ----- | 28 |
| 4.1 Demographic characteristics of respondents ----- | 28 |
| 4.2. Status of respondents in usages of electric appliances ----- | 30 |
| 4.3. Non-electric sources of fuel in rural areas ----- | 31 |
| 4.4. Disadvantages of fire-wood, coal, dung and kerosene ----- | 31 |
| 4.5. Benefits of Electric power as compared to non-Electric Energy ----- | 32 |
| 4.5.1. Health status of Beneficiaries ----- | 32 |
| 4.5.2. Costwise comparison between electric power and non-electric energy usage ----- | 33 |
| 4.5.2.1. Cost implication of grinding in Grain mills ----- | 34 |
| 4.6. Respondents views on Accessibility of Electric power ----- | 34 |
| 4.7. Challenges of Rural Electrification in SNNPR ----- | 35 |

| | |
|--|-----------|
| 4.8. Contribution of Rural electrification in communication and water services----- | 37 |
| 4.9. Contribution of Rural electrification for micro-enterprises----- | 37 |
| 5. Conclusion and Recommendations----- | 40 |
| 6. References----- | 42 |
| 7. Annex ----- | 45 |

LIST OF FIGURES

| | |
|--|----|
| Figure1.Status of electric power usage by respondents | 28 |
| Figure2.Status of electric power usage of respondents | 30 |
| Figure3.Number of respondents utilizing electric appliances..... | 30 |
| Figure4.Source of non-electric energy in rural areas..... | 31 |
| Figure5.Disadvantages of non-electric energy sources..... | 32 |

LIST OF TABLES

| | |
|--|----|
| Table1. Electrified towns/villages at the end of 2005..... | 21 |
| Table 2.Regional distribution of households to be electrified (2011-2015)..... | 22 |
| Table3.Villages/towns to be electrified during GTP years | 23 |
| Table4.Number of household clients at selectedworedas..... | 26 |
| Table 5.Demographic characteristics of respondents..... | 29 |
| Table6.Comparison of electric power with other power sources | 33 |
| Table7.Comparison of electric power with respect to cost of other power sources..... | 33 |
| Table 8.Cost of Grinding in grain mills..... | 34 |
| Table 9.Micro-enterprises in sample woredas of Sidama Zone, 2011..... | 39 |

ACRONYMS

| | |
|---------|---|
| AFDB | African Development Bank |
| BADEA | Bank of Arab for Economic Development in Africa |
| CSA | Central Statistical Agency |
| ESDP | Education Sector Development Program |
| GOE | Government of Ethiopia |
| GTP | Growth Transformation Plan |
| HSDP | Health Sector Development Program |
| MDGs | Millennium Development Goals |
| MoFED | Ministry of Finance and Economic Development |
| PASDEP | Plan for Accelerated and Sustained Development to End poverty |
| SDPRP | Sustainable Development and Poverty Reduction |
| Program | |
| SNNPR | Southern Nations Nationalities & Peoples Region |
| UEAP | Universal Electrification Access Program |

ABSTRACT

This research is intended to assess the benefits and contributions of rural electrification in SNNPR particularly in Sidama zone. The data used in this paper is collected through interview schedule and use of questionnaire. Tables and graphs were used to show the benefits and contribution of rural electrification in comparison to traditional fuel sources.

The study revealed that rural electrification produced many social and economical benefits such as cost saving both with respect to time and money. It does also have immense contribution in mitigating health problems as compared to traditional fuel sources, such as, wood and “Kubet” (a local term for dried dung). The assessment has also shown that rural electrification tends to reduce deforestation and enhance environmental protection.

Despite the many social and economical benefits identified by the investigations, the institution EEPCO has many gaps in the coverage of rural electrification in the region, especially, in availability of supplies with regard to the distribution of KWHM and transformers.

Chapter One

1. Introduction

1.1 Back-ground

In a globalised world, access to electricity is almost taken as a basic human right. National electrification programs are given priority in many developing countries and the level of electrification generally is seen as one of the key indicators of development.

According to IEA (2009), worldwide, 1.456 billion people do not have access to electricity, of which 83% live in rural areas. In sub-Saharan Africa less than 10% of the rural population has access to electricity (public private partnership in infrastructure Resource center “Rural Electrification,” World Bank, 2012). Worldwide rural electrification progresses only slowly. The IEA estimates that, if current trends do not change, the number of people without electricity is expected to rise in sub-Saharan Africa.

In order to improve the quality of life and to encourage Ethiopians to diversify economic activities, the Government of Ethiopia embarked in a rural electrification initiative in 1998. In 2005/2006 this project was followed by more ambitious electrification programs, the Universal Electrification Access Program (UEAP). Through this program thousands of small and medium size towns have had or will gain access to electricity that will benefit the population as well as the formal and informal enterprises established in these towns.

The aim of this study is to assess the benefit of electric power to rural people and to identify the contribution of electric power to the poverty reduction and meeting the Millennium Development Goal (MDG).

The introduction of electricity in rural communities brings on a series of benefits, which can be hardly expressed in monetary terms, but have a paramount importance in the improvement of livelihood and in the Economic Development or poverty alleviation, such as:

- Reducing women's burden;
- Enhancement of education and health care facilities;
- Availability of safe drinking water;
- Sustainable Economic Development;
- Lighting for homes, streets and community centers;
- Possibility of use of household appliances (TV,refrigerator,telephone,etc);and
- Introduction of agricultural and industrial opportunity.

By ensuring a regular and more sustainable supply of electricity, it will create possibilities for new activities, which in turn brings about opportunities for employment.

That is why electric power is considered as key instrument for development which could make a difference in rural life by alleviating poverty.

The Government's new commitments in relation to improving access to electricity are outlined in its Growth and Transformation Plan (GTP). Through the UEAP, the GTP intends to provide access to electricity to 75% of the country which enable an additional 24.4 million people get electric power over the 2010/11 to 2014/15 period.

1.2. Statement of the Problem

Prior to 2006 most of the areas in SNNPR were not electrified. As a result life was difficult, and specifically, women faced higher work burden. Besides, the land had been deforested for fuel purposes.

Cognizant of these facts, the Government of Ethiopia launched a Universal Electrification Access Program (UEAP) in 2006. Since then, several projects intended to widen access to electric power in the region has been implemented.

This research was intended to identify the contribution of electric power in poverty reduction and the benefits of rural electrification to the rural communities

This study, therefore, uncovers the following questions:

1. What are the benefits of rural electrification to the communities residing in Sidama zone?
2. What are the benefits of electric power in poverty reduction programs?

1.3. Objectives of the Study

► The objectives of this study were to:

- ✓ Assess the benefits of electric power to rural communities;
- ✓ Assess the contribution of electric power to poverty reduction and meeting the Millennium Development Goal (MDG).

1.4. Scope of the Study

The study covers the electrified sample rural towns in Sidama zone from 2006-2010. During this period the Corporation has electrified 6,317 rural towns all over Ethiopia. While the electrified towns/villages in SNNR were 866 and 112 in Sidama Zone (Southern region UEAP office, 2013). Since the study was specific to Southern Nations Nationalities and Peoples Region (SNNPR), specifically to five Woredas (out of the 19) in Sidama zone, namely, Awassa zuria, Boricha, Malga, Gorche and Arbegona.

Chapter two

2. Literature Review

Rural electrification is the process of bringing electrical power to rural and remote areas.

Electricity is used not only for lights and household purposes, but caters to the requirement of agriculture and other activities, including irrigation pump sets, small and medium industries.

Electricity is pervasive in all industrialized countries and largely absent in developing world. An estimated 1.6 billion people currently do not have access to electricity (Saghir, 2005). Eighty percent of these people live in rural sub-Saharan Africa and South Asia (UEAP, 2013).

According to the World Development Indicators (2007) access to electricity is lowest in low income countries and, as percentage of population, is lower than access to other infrastructure such as telecommunication, water and sanitation. While access to electricity is undoubtedly the major problem facing electricity reform programs in developing countries, much progress at an individual country level has been achieved. In recent years, for example, electrification levels have more than doubled in South Africa from 34 to 70% between 1994 and 2001 and from 20 to 42% in Zimbabwe between 1980 and 2001 (Davidson and Mwakasonda, 2004).

Ethiopia is home to an estimated 85 million people, and the annual growth rate is about 3%. The country had one of the world's lowest rates of access to modern energy

services, and relies primarily on traditional biomass to fulfill its energy needs (EEPCO, 2010).

According to Action Aid (1994:4), Ethiopia is famed for its varying climatic land, 63% of the total area commands a large livestock population, and a network of rivers and lakes with a considerable potential for Hydro Electric Power, irrigated agriculture and fishing. These potentials, however, are not adequately tapped in a manner that could alleviate the pressing problems that could negatively impinge on the day- to- day life of the rural poor (EEPCO, 2010).

Notwithstanding the fact that Ethiopia is endowed with huge human resource, arable land, livestock and natural resources, much of the country had not been adequately exploited. This in turn calls for a heavy dependence on rain-fed agriculture, reliance on traditional skills and backward techniques of production, continuous environmental degradation, and high rate of population growth, adverse climatic conditions and poor performance of the Ethiopian economy. As a result of these factors, Ethiopia remained one of the poorest countries in the world.

Recognizing this fact the Government of Ethiopia (GOE) is embarking on an unprecedented program of electrifying the rural towns/villages to meet the demand of agricultural, industrial and commercial sectors to generate increased output, employment and income for the people.

In order to achieve the objectives the Ethiopian Electric power Corporation Formulated the Universal Electricity Access Program (UEAP) in 2005/2006. At the end of 2005 the number of electrified towns and rural villages were about 693 out of 7799 villages. The

number of electrified towns and rural villages highly increased from 693 to 6317 at the end of 2012 which brought the electric energy access to 48.3%.In SNNPR, the numbers of electrified towns/villages were 886 and 112 in Sidama zone (UEAP, 2013).

2.1. Benefits of Rural Electrification in Socio-Economic Development

Electricity can be used for lighting and vocational teaching in schools, sterilization and refrigeration in health clinics, public water systems, and street lighting. Such uses are likely to benefit the poor disproportionately, especially if these are offered free or nearly free of charge. Some have argued that these public benefits are indeed likely to be more important for the poor than are household benefits, which tend to reach higher-income groups to a large extent, therefore possibly justifying the subsidization of social uses of electricity (Tendler, 1978).

It would be reasonable to say that without electricity, investment in the area continues to be under-developed.

The introduction of electricity in rural communities brings on a series of benefits, which can be hardly expressed in monetary terms, but have a paramount importance in the improvement of livelihood and in the economic development or poverty alleviation.

I. Poverty Alleviation

People, in poverty afflicted rural areas, frequently suffer from the so -called “vicious circle” of energy poverty. They have no energy to operate machines and as a result they achieve low productivity. Low productivity results in little cash, and hence less money to buy improved energy services.

Farmers in Ethiopia place high value to improved energy services if their income increases through increased productivity. If available, they will use more improved energy farms and their welfare is enhanced and in addition, their income-generating potential will be expanded. From this perspective improved energy service, like electricity, plays an important role in breaking “vicious circle” of energy poverty.

The supply of electricity will enable the rural poor to use irrigation pumps and there by obtain higher output and increase their income which is highly important to poverty reduction. The poor will as well benefit from availability of potable water in the village which renders them high socio-economic value and improve health care.

The supply of electricity will enable an increasing number of households to become connected to the network in the future, contributing to an improvement of the standard of living.

Non-electrified households are poorer than electrified ones in many ways. Lower level of education, more self employed, fewer small businesses at home, less access to loans, banks or cooperatives, living farther out from the main road, a very small houses more often made with traditional construction materials, more likely to get drinking water from unprotected wells or springs and having significantly fewer durable goods.

Village electrification also changes the day-to-day life of the poorest households who remain unconnected to the grid. Safety is enhanced as people are able to move around in the village in the evenings, go to school, visit friends, participate in social meetings and visit local shops. Such households also appreciate the extension of local health services as they no longer have to travel to the nearest city to buy vaccinations and medication. All school children benefit from improved school services (EEPCO, 2010).

II. Reducing Women's Burden

As it is well described above, agriculture is the mainstay of the economy. Out of the Ethiopian population, 80% of the people live in rural areas, where 50% of them are women, and around 20% of the rural households are headed by women. Moreover, the wives in the male-headed households do participate in every agriculture activity, in addition to their day-to-day house work and child caring. Therefore, in order to make a meaningful improvement in the agricultural sector of this country we have to have ways of reducing the work load of women(EEPCO, 2010).

One of the key issues when addressing women's energy need is reducing 'time poverty', which is releasing women's labor time to improve economic activities, so that it will be possible for them to earn income, and hence, increase their ability to pay for energy services.

Poor farmers are not only resource poor but also time poor. Women in poor areas shoulder the burden of most "Domestic" activities (regarded as secondary to main 'productive' tasks such as working in the fields on crop production), such as cooking

and collecting fuel wood. Such 'Domestic' activities require substantial time inputs, and there is less time to spend on 'productive' activities.

Improved energy services could reduce the time involved in 'domestic' tasks considerably. With electrification, the major time savings occur in grinding and milling activities. Households without electric mill have to turn to their stone mill powered by human energy to grind grain. Women disproportionately bear the negative impacts of inadequate energy service. Cooking by fuel wood or illuminated by kerosene lamp, would lead to several problems like breathing problems, (suffocation which is due to usage of fuel wood), eye disease, etc (UEAP, 2013).

Women's energy needs are likely to be different to those of men, while women spend on increasing portion of their time working in the fields, they remain primarily responsible for 'domestic' activities which require a range of energy inputs.

Men primarily working in the fields mainly depend on human power and animal. As the main actors in the economy of rural areas, women and their energy use will have to be addressed, specifically, if poverty is to be reduced. Improved energy services are needed to be introduced to release women from their heavy burden of domestic tasks. This implies that there is a level of gender inequality and suggests that the intervention addressing energy use and poverty reduction needs to be more focused on gender equality.

The impacts of rural energy development on poverty alleviation and gender equality have clearly been significant. The improved design of future rural electrification projects,

taking gender and poverty issues into account will contribute to reducing poverty and increasing public awareness of gender equality.

The project is expected to improve the position of women by enabling them to use electrical appliances such as flour mills, 'Metad' (a stove widely used to bake traditional food), and can use the time they spent for fire wood collection and water fetching for other productive activities like education and family care(UEAP,2013).

III. Water supply

Water supply is another area where poverty plays a big role in the degradation of the environment. The poor have no easy access to water supply of good quality of all times. In many cases the poor spends a lot of time fetching water of suspicious quality. More often than not the poor get their water from shallow wells that in many cases are near privies or near domestic animals grazing land which inevitably pollute the water. In some areas rain water might be the only feasible means of obtaining clean water (UEAP, 2013).

Adding electric-powered wells for clean water can prevent many water-borne diseases, such as dysentery, by reducing or eliminating direct contact between people (hands) and the water supply.

So far the utilization of water resource for irrigation, hydro power and domestic use is insignificant compared to available potential. To change this state major effort is being made in the sector. One of the key factor for improving irrigation and pure water supply is by securing the supply of electricity (UEAP, 2013).

Iv.Education

The Government of Ethiopia (GOE) has proposed the Education Sector Development Program (ESDP). The ESDP envisages the expansion of educational opportunities so that by 2015 Ethiopia will attain Universal Primary Education. It emphasizes the expansion of primary education in rural areas as well as the promotion of education of girls. The supply of electricity will have direct benefits for the provision of quality education (MoFED, 2005).

V.Health

The Government of Ethiopia (GOE) developed the Health Sector Development Program (HSDP).The HSDP focus to develop comprehensive and integrated primary health care services at all levels with primary emphasis at community level. The goal of HSDP is to improve the coverage of primary health services from about 40% to 55% and immunization from 67% to 80% over the next two years. These goals of HSDP can only be achieved and the rural poor get primary health services and immunization by the provision of regular and reliable electricity (UEAP, 2013).

VI. Sustainable Economic Development

The supply of electricity will bring economic impact at micro and macro level, and also benefit the country with positive effects on Environmental management.

One of the key factors that led to poverty in Ethiopia is a heavy dependence on rain-fed agriculture and reliance on traditional skills and backward techniques of production. These facts are highly correlated with the provision of electricity to rural areas.

For instance, the key factors for improving irrigation and pure water supply, reducing women burden, provision of quality education and primary health service is securing the supply of electricity. All these are directly or indirectly linked to the productivity and welfare of the society (EEPCO, 2010).

In-home electricity brings about changes in home life for all rural household, poor families should no longer live in the dark. Electricity lighting is unquestionably the first direct advantage of household electricity, leading to increase safety in the house and the ability to work longer hours. It is known that the immediate effect of electrification on the poor is that they can reduce their regular expenses for buying kerosene for cooking and lighting and could use electric pump for irrigation and water supply. Having electric at home also result in having more extra time. The length of day is slightly increased, especially for men, when electricity is available at home. Women gain by reducing unnecessary travels and by utilizing electric appliances (EEPCO, 2010).

The existing traditional pattern of energy consumption in Ethiopia in general has already facilitated deforestation, shortage of wood fuel and, in general, degradation of rural ecosystems. The deforestation caused soil erosion and as a result productivity of the farm land is diminishing from year to year. Hence, the Government has planned to create access and develop the supply of electricity (modern and clean energy) at most efficient and cost effective way to rural communities including the majority of rural

towns. Generally, access of electricity to rural areas is one component of Millennium Development Goals (MDG) to reduce poverty, improve education and to promote Environmental sustainability (MoFED, 2005).

By ensuring a regular and sustainable supply of electricity, it will create possibilities for new activities, which in turn bring about opportunities for employment. That is why electric power is considered as key instrument which could make a difference in rural life by alleviating poverty.

In order to improve the quality of life and to encourage Ethiopians to diversify economic activities, the Government of Ethiopia embarked in rural electrification initiative in 1998 E.C. In 2005/2006 this project was followed by amore ambitious electrification programs, the Universal Electrification Access Program (UEAP). Through this program thousands of small and medium sizes towns have had or will gain access to electricity that will benefit the population as well as the formal and informal enterprises established in these towns (UEAP, 2013).

Increasing access to electricity is an integral component of the Government of Ethiopia's strategy to eradicate poverty. The government launched its first Sustainable Development and Poverty Reduction Program (SDPRP) in 2002/2003. This program was followed by Plan for Accelerated and Sustainable Development to End Poverty (PASDEP) in 2005/2006. Under PASDEP it was planned to increase access to electricity by 50%, in that 6000 rural towns and villages with an estimation of 24 million additional populations would have access to electricity. However, UEAP has achieved 41% at the end of program year (UEAP, 2013).

The Government's new commitments in relation to improving access to electricity are outlined in its Growth and Transformation Plan (GTP). Through the UEAP the GTP intends to provide access to electricity to 75% of its population enabling an additional 24.4 million people to benefit over 2011/2012 to 2014/2015 period. Extending electrification will contribute to fulfilling some of the Millennium Development Goals related to poverty eradication, education improvement in people's health and environmental sustainability (UEAP, 2013).

The UEAP includes several components that support the augmentation of generation capacity as well as the expansion of transmission and distribution networks. The project is funded by several stakeholders, mainly the GOE, and, some other partner 'institutions' and the World Bank, Bank of Arab for Economic Development in Africa(BADEA),the Kuwait fund, African Development Bank(AfDB) and bilateral cooperation from development partner countries like Indian Government(AfDB,2006).

2.1.1. Benefits of Rural Electrification in Economic Development

Since the industrial revolution, energy has been a crucial ingredient of economic development. It is a direct (e.g. used in the industrial process and transport) and indirect input (the energy content of used goods, equipment and services) for most productive process in primary sectors (mining, agriculture), industry and, including transport and IT.

Industry absorbs 30% of the world energy consumption and uses it in all its transformation processes (e.g. heating,drying, and melting) and as a mechanical and driving force. Road, rail, sea and air transport mostly depends on oil products and increasingly on electricity, accounting for 27% of total consumption. The first two major

sectors, industry and transport, which absorb almost 60% of global energy consumption, mostly rely on commercial energies. Service activities (e.g. education, trade, offices, tourism etc.) like the residential sector, abundantly use energy to meet their multiple needs (lighting, cooking, hot water, heating, air-conditioning, IT, telecommunication, refrigeration and other electric household appliances). With agriculture, which mostly uses mechanical force and energy-intensive inputs such as fertilizers, these sectors account for 33% of the total consumption of energy (Laponche, 2005).

2.1.2. Benefits of Rural Electrification in Social Development

Electricity is required to meet basic human needs. Thus, population access to modern forms of energy is essential for the provision of clean water, sanitation, and health care.

Also, through the provision of reliable and efficient lighting, heating, cooking, mechanical power, transport and telecommunication services, energy, especially electricity, offer numerous social benefits, including:

- Job creation in agriculture and industry (especially food processing) in rural areas;
- comprehensive primary education, thanks to lighting, which allows study after sunset in rural areas, something that attracts teachers;
- Reduced child and female mortality and enhanced gender equality: access to electricity and efficient fuels and cooking appliances reduce in house pollution that causes disease: and partly, frees up women from traditional domestic tasks.

Strong interactions exist between energy consumption and social conditions in general particularly for the situation of women(IEA/OPEC/OPEC/OECD/World bank, 2010). The provision of modern, secure and affordable energy services and appliances (cooking, lighting, cooling) enhance a population's living standards and social development.

2.2. Rural Electrification and Rural Development

The dominant ideas of development economics of 1950's to 1970's largely considered rural transformation over the course of the last two decades. The perception that rural electrification was a "precondition" for rural development has given way to the current thinking that under certain circumstances, the development process may indeed lead rather than follow rural electrification(Kirubi,C.etal,2009).

Centralized grid-based rural electrification in Africa and elsewhere has roots in post-WWII development economics. As part of the import-substitution industrialization (ISI) development strategy, availability of abundant and cheap electricity was seen as a precondition for an industrial revolution in Africa (IBRD, 1962). On the basis of this view, failure to extend electricity to rural areas meant loss of development potential. Substantial upfront investment in rural infrastructure, including electricity, was central to employment creation in developing countries, argued Mellar (1976).

2.3. Rural Electrification for Poverty alleviation

The concern for rural electrification has resurfaced in recent years with the heightened interest in infrastructure in relation to the part that it can play in improving welfare and reducing poverty. Poverty is now officially recognized as the core issue of international development; notably, halving absolute poverty by 2015 is at the top of the list of the Millennium Development Goals (MDGs), and the MDGs are recognized by most aid (UN, 2000).

The link between energy and poverty was clearly laid out in a number of the world Bank's reports (world Bank, 1996).By 2008 the world Bank claimed that the economic case for investment in rural electrification is proven and that the benefits to rural households are above the average long run supply costs, indicating that cost recovery tariff levels are achievable (World Bank 2008).The world Bank's coverage of rural electricity is still low in South Asia and Sub-Saharan Africa and it acknowledges that it supports few projects in the countries where access to electricity is poor and rural electrification is limited, although new energy projects have recently commenced in Ethiopia,Uganda,and Tanzania(P.Cook,2013).

The World Bank Group's mission was to fight poverty for lasting results and to help people help themselves and forging partnership in the public and private sectors, according to studies made in Bangladesh,Ghana,Indonesia,Morocco,Nepal (World Bank,2008).

Nicaragua,Peru, Philipines and Senegal reveal that rural electrification yields great benefits, such as improvement of health facilities, better health from cleaner air, as

house-hold reduce use of polluting fuels for cooking, lighting and heating, improved knowledge through increase access to television and better nutrition from improved knowledge and storage facilities from refrigeration. Electrification was also found to reduce worker absenteeism in both health clinics and schools by improving living conditions and morale. Poverty alleviation by using “clean” renewable energy sources is possible by starting economic activities. The position of women can be improved by using these sources (Owens, 2006).

Though modern and renewable energy sources, such as electricity, directly contribute to human development by extending hours of work, preventing indoor air pollution, and dispersed rural settlements, and limited affordability of households, are major constraints to the growth of electricity access (World Bank, 2003).

2.3.1. Rural Electrification and the Millennium Development Goal in Ethiopia (MDGs)

The Ethiopian Government, in its Millennium Development Goal program is intending to progress the coverage of electricity in the country. Currently, less than 6% of the population has access to electricity supply (13% live in electrified areas) while the rest of the population relies on biomass energy, with serious environmental consequences. The existing distribution network is overloaded, resulting in the inability of connecting large new commercial customers, and more generally, in the poor quality of existing services, characterized by low voltage levels, voltage fluctuations beyond acceptable ranges and frequent breakdowns. Increasing electricity access (from about 13% to about 20% by 2012) is an integral part of the MDGs strategy to promote income-

generating activities and social services outside major urban centers in order to improve living standards and reduce poverty. Promoting access to electricity is also part of the Government strategy to decentralize the delivery of services throughout the country (MOFED, 2005).

2.3.2. The Plan for Accelerated and Sustained Development to End Poverty (PASDEP)

Poverty is a multidimensional and dynamic phenomenon. It has multiple causes that exhibit economic, social, and political characteristics and poverty reduction requires multi-dimensional approaches and strategies. We have reached an era in which the moral and economic justifications for reducing and even eliminating chronic poverty have received international support. Addressing the problems of poverty has become one of the priority policy targets of governments and yet the task has proved itself as daunting. The challenges and impediments to reduce poverty are formidable in developing countries where poverty is deep and widespread (Abu, 2007).

The development policies and strategies and pursued during Sustainable Development and Poverty Reduction Program (SDPRP), the country's vision and achievements registered under SDPRP were the basis for the PASDEP. The Plan for Accelerated and Sustained Development to End Poverty (PASDEP) is the first five year phase to attain the goals and targets set in the MDGs at a minimum. The main objective of the PASDEP is to lay out the direction for accelerated, sustained, and people-centered economic development as well as to pave the ground work for the attainment of the MDGs by 2015 (MoFED, 2010).

Access to efficient and affordable electricity services is a necessity in any country as it contributes to stimulate economic development and to alleviate poverty. It is particularly important in Ethiopia where the national poverty rate was estimated to 44% in 1999/2000, according to CSA, welfare monitoring survey of 2004. The country together with development partners, as a result, has put poverty reduction strategies high on the agenda and working firmly on the implementation program since the beginning of this decade. With firm dedication to reduce poverty, the government has prepared its poverty reduction program entitled “Sustainable Development and Poverty Reduction Program” (SDRP) in 2002(UEAP, 2013).

2.4. Electrification by Region

Before 2005 the number of electrified towns/villages in each region is shown in table1.

Table1. The number of electrified towns/villages at the end of 2005.

| No | Region | Total no of towns/villages in the region | No of electrified towns/villages in the region | Electric supply coverage |
|----|-------------------|--|--|--------------------------|
| 1 | Tigray | 582 | 44 | 7.6 |
| 2 | Afar | 135 | 13 | 9.6 |
| 3 | Amhara | 2,279 | 132 | 5.8 |
| 4 | Oromiya | 2942 | 344 | 11.7 |
| 5 | Somali | 265 | 17 | 6.4 |
| 6 | Benishang ulGumuz | 154 | 5 | 3.2 |
| 7 | Gambela | 149 | 3 | 2.0 |
| 8 | SNNP | 1252 | 126 | 10.1 |
| 9 | Harari | 17 | 7 | 41.2 |
| 10 | DireDawa | 24 | 2 | 8.3 |
| | | 7799 | 693 | |

Source: UEAP Assessment report, July 2013

The model chooses to electrify kebeles based on economic criteria including the population size and density and, in the case of non-electrified kebeles, the location of the kebele relative to already electrified kebeles. Based on these criteria, the number of electrified households in each region is shown in table 2.below.

Table 2.Regional Distribution of households to be electrified (2011-15)

| No | Region | # households (2012) | Households to be electrified(2011-15) | Households to be electrified as % of population |
|----|-------------------|---------------------|---------------------------------------|---|
| 1 | Afar | 228,012 | 3492 | 2% |
| 2 | Amhara | 4,477,366 | 263432 | 6% |
| 3 | Benishangul Gumuz | 121,624 | 2470 | 2% |
| 4 | Dire Dawa | 139,374 | 1311 | 1% |
| 5 | Gambella | 37,686 | 1471 | 4% |
| 6 | Harari | 157,708 | 1145 | 1% |
| 7 | Oromia | 5,759,088 | 412176 | 7% |
| 8 | SNNP | 3,120,842 | 403991 | 13% |
| 9 | Tigray | 1,101,533 | 29778 | 3% |

Source: Fechner, 2013

Table 2 shows that the distribution of connections is skewed toward SNNPR,Oromia and Amhara. In the case of SNNPR, the main reason for this disparity is the relatively high population density in the SNNPR and the relatively low initial electrification rate in the region.

Table3.The villages or towns to be electrified during the Growth and Transformation Plan (GTP)

| No | Region | 1998-2002 | 1998-2003 | 1998-2004 | 1998-2005 | 1998-2006 | 1998-2007 |
|----|--|-----------|-----------|-----------|-----------|-----------|-----------|
| 1 | Tigray | 289 | 331 | 373 | 447 | 521 | 621 |
| 2 | Afar | 83 | 98 | 113 | 139 | 165 | 203 |
| 3 | Amhara | 1,125 | 1,320 | 1,515 | 1,847 | 2,179 | 2,645 |
| 4 | Oromia | 1,428 | 1,755 | 2,082 | 2,638 | 3,194 | 3,984 |
| 5 | Somali | 97 | 133 | 169 | 231 | 293 | 382 |
| 6 | Benishangul | 89 | 107 | 125 | 155 | 185 | 229 |
| 7 | Gambela | 44 | 54 | 64 | 81 | 98 | 124 |
| 8 | SNNP | 710 | 866 | 1,022 | 1,292 | 1,562 | 1,926 |
| 9 | Harari | 8 | 10 | 12 | 14 | 16 | 19 |
| 10 | Dire Dawa | 13 | 15 | 17 | 20 | 23 | 29 |
| | Total | 3,886 | 4,689 | 5,492 | 6,864 | 8236 | 10,162 |
| | Electric coverage in % | 41 | 46 | 51 | 58 | 65 | 75 |
| | No of electrified towns/villages with in the budget year | | 803 | 803 | 1,372 | 1,372 | 1,926 |

Source:UEAP assessment report, 2013.

Chapter Three

3. Methodology

3.1. Socio-economic Profile of Sidama Zone

3.1.1. Physical Background

3.1.1. 1.Location, Area and Administrative Divisions

Sidama Administration zone is found in SNNPR regional state and it is one of the 14 Zones in the region. It is located in the north eastern part of the region and bounded by Oromiya in the Northeast and southeast, with Gedio Zone in the South, and Wolayta Zone in the west. Its geographic location lies between $6^{\circ} 14'$ and $7^{\circ} 18'$ North latitude and $37^{\circ} 92'$ and $39^{\circ} 14'$ East longitude.

The total area of the Sidama Administration Zone is about 6981.8 Sq.Km. It consists of 19 woredas and two administrative towns (Socio-economic profile of Sidama Zone, 2011).

3.2. Population Size

3.2.1. Demographic Characteristics

A study of population can provide the basis to understand and to design the development needs such as infrastructure, health centers, educational institutions, etc. It is also important for the wise use of resources by matching with the size of population.

For the year 2011, Sidama population was estimated to be about 3,277,078, accounting to 19.78% of the regional population.

3.2.2. Population Distribution

The population of Sidama is highly distributed in areas where there is fertile land water and pasture. The Sidama Zone is one of the most densely populated areas in the region. Even within the Zone there is a great variation with in the woredas in population density.

3.2.3 Population Growth

According to the 2007 population census the annual population growth rate of Sidama Zone is 2.8% per year in rural areas and 4.8% in urban areas (CSA, 2007).

3.3. Economic Sectors

3.3.1. Agriculture

3.3.1.1. Crop production

Agriculture is the backbone of Ethiopia's Economy. It is also major and dominant economic sector in the Sidama Zone. As it is economic base of all over the country, agricultural production is the pre-dominant activity of Southern region which encompasses crop and livestock production. However, due to cultural and environmental factors, peasants in the zone mainly depend on enset and coffee for consumption as well as for cash income. Since the area is mainly known for its cash

crop the contribution of rural electrification is so high in order to increase the economical value of coffee production.

3.4. Sampling Techniques

The sampling techniques used in this research were purposive sampling and simple random sampling. Firstly, 5 Woredas of Sidama zone, which were electrified earlier, were elected, purposively for the study (Table 4).

Table 4. Number of house-hold clients at each of the selected woredas.

| No | Name of woreda | Name of kebeles | Number of household customers (population) | Sample taken from the population |
|----|----------------|-----------------|--|----------------------------------|
| 1 | Awassa Zuria | Shamena | 142 | 23 |
| 2 | Boricha | Belila | 122 | 13 |
| 3 | Gorche | Haysawita | 110 | 12 |
| 4 | Malga | Guguma | 128 | 15 |
| 5 | Arebegona | Bochesa | 137 | 20 |
| | | | Total=639 | Total =83 |

Source: Awassa District Service center two office, 2011

At each kebele of the woreda respondents were identified on the basis of random sampling. Out of the study population of 639, the total number of respondents in these five kebeles were 83 (Table 4).

The size of kebele of respondents selected is proportional to the size of the total population residing at each kebele.

3.5. Data Collection

This research had used both primary and secondary data sources. Primary data were collected from clients of Ethiopian Electric Power Corporation (EEPCO) by using different data collection tools. Secondary data were obtained from reports, research articles, working papers and different published and unpublished documents.

3.5.1. Toolsfor data collection

Among the different tools used for data collection, this research had generated data using a combination of structured and unstructured questionnaires. The questionnaire, after being developed, was pilot tested so that some errors in data collection could be pre-corrected. Besides, a structured interview was handled so as to consolidate/validate/cross-check survey result obtained from the questionnaire.

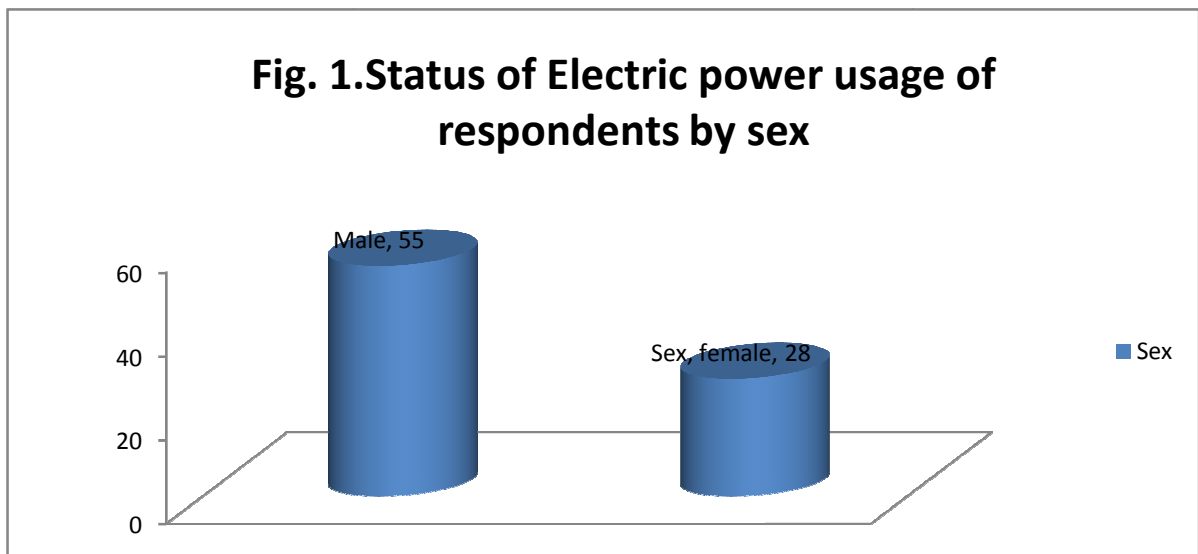
The researcher collected qualitative data using personal interview with different stakeholders, namely, investment office, water development and Ethio-telecom, on the contribution of rural electrification in poverty reduction. To enhance the quality of data, the researcher was directly involved both in the collection of quantitative as well as qualitative data.

Chapter four

4.Results and Discussion

4.1. Demographic Characteristics of respondents

Among the 83 respondents, 66.3%of respondents were male and the rest were female. This implies that there are more male electricity users than female and gender balance in electricity usage is not equitable (Fig.1).



Source: Survey data collected during October 2013

As per their age distribution is concerned, the majority were in the age group between 26 and 45 years(Table5).

Table 5. Demographic Characteristics of respondents

| Age group | Freq. | %ge | Level of education | Freq. | %ge | Access period | Freq. | %ge |
|--------------|-------|------|-------------------------------------|-------|------|---------------|-------|------|
| 18-25 | 8 | 9.6 | | | | | | |
| 26-30 | 26 | 31.3 | Below grade 10 | 44 | 53.0 | Below 1 yr | 3 | 3.6 |
| 31-35 | 24 | 28.9 | 10 th & 12 th | 18 | 21.8 | 1 to 2 yrs | 36 | 43.4 |
| 36-40 | 7 | 8.4 | TVET graduate | 9 | 10.8 | 2 to 4 yrs | 40 | 48.2 |
| 41-45 | 17 | 20.5 | College diploma | | 10.8 | 5 & above yrs | 4 | 4.8 |
| >=46 | 1 | 1.2 | First degree | 3 | 3.6 | Total | 83 | 100 |
| Total | 83 | 100 | Total | 83 | 100 | | | |

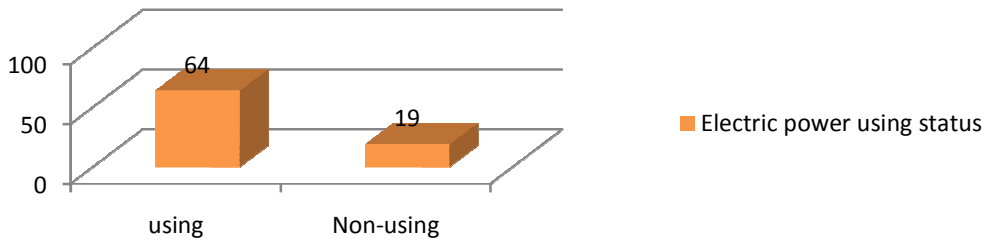
Source: Own Computation from data collected in October, 2013

With regard to educational status, the majority (53.0%), had below grade 10 level of education. Those who completed grade 10 and 12 were 18 in number. Only 3.6% of the respondents were first degree holders and the remaining 10.8% were diploma graduates (Table 5).

On the other hand, when one evaluates electric power usage status of the respondents, 36 of them had access to electricity for the last 1 to 2 years, while 40 of them were served with electric power for the last 2 to 4 years (Table 5).

Out of 83 respondents, 77.1% had responded that they were beneficiaries of electric power at their home. This shows that the majority of the populations in this particular rural area were utilizing electric power (Fig2).

Fig.2.Status of Electric power usage of respondents in number



Source: Own survey from data collected in October 2013

4.2. Status of Respondents in usage of electric Appliances

The majority of the respondents did not use electric stove, electric baking 'Mitad' and refrigerator in their homes. Only 7.2%, 4.8%, 12.1% of the respondents use electric stove, electric 'Mitad' and refrigerator, respectively (Fig.3).

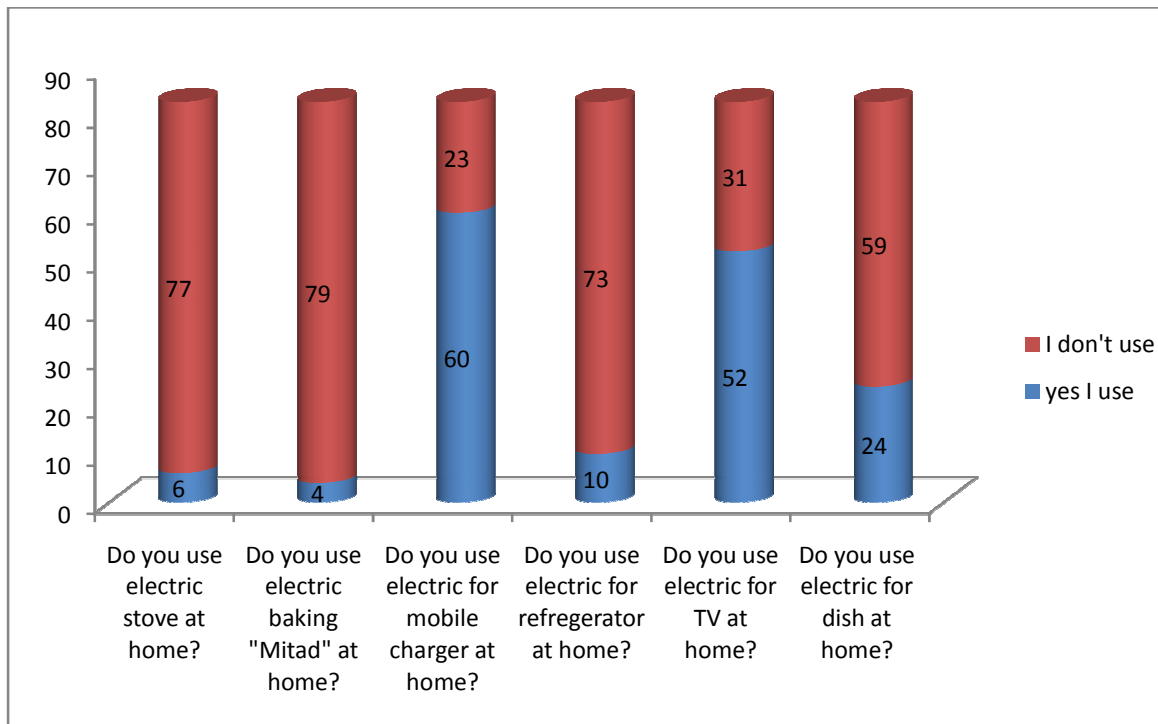


Fig. 3. Number of respondents utilizing electric appliances; Source: Own survey data

Surprisingly, 62.7% of the respondents had been using electric power to watch television programs, which indicates that farmers, relatively, are nearer to information, especially in knowing the market price of cash crops, like coffee and Enset.

4.3. Non-electric Sources of fuel in rural areas

Respondents were also asked to specify the non-electric energy sources they are utilizing in day-to-day operation. The majority had responded that they are using fire wood for cooking. Thus, 91.6% of the respondents depend on fire wood for home cooking, 42.2%, 27.7% and 36.1% of the 83 respondents replied that they had been using coal, 'Kubet' and Kerosene for their home cooking purposes, respectively (Fig3.).

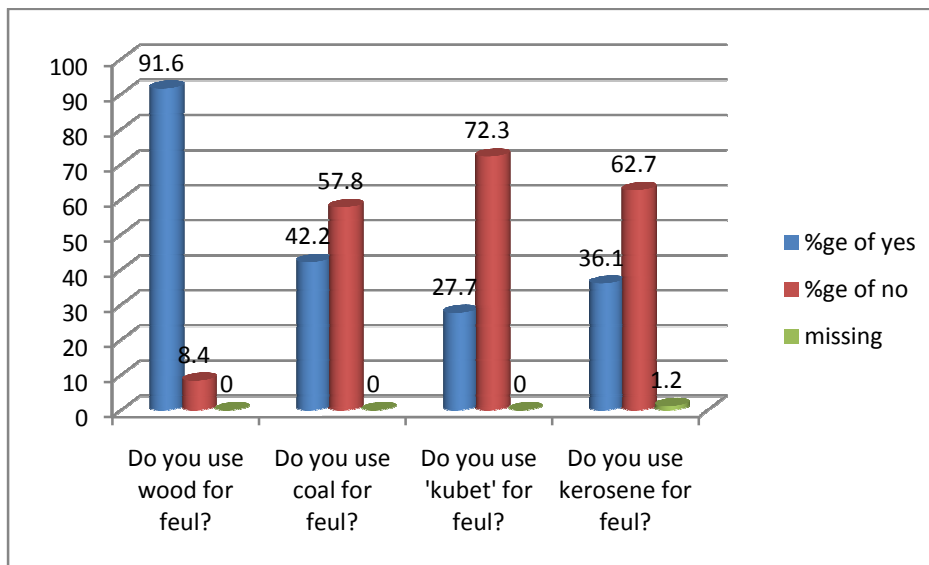


Fig. 4. Source of non-electric energy in rural areas; Source: Own survey collected in October 2013

4.4. Disadvantages of fire wood, coal, dung and kerosene

When asked on the disadvantages of utilizing non-electric energy sources, 63 of them had claimed that it contributes to deforestation, 32 had stated that it contaminates the

air at home and 63 responded by stating that the smoke hurts the eyes and throats of users(Fig.5).

According to most respondents, the other disadvantages of non-electric fuel source was that non-electric fuel sources, like fire-wood,kerosene,and coal demands higher price than electric power.

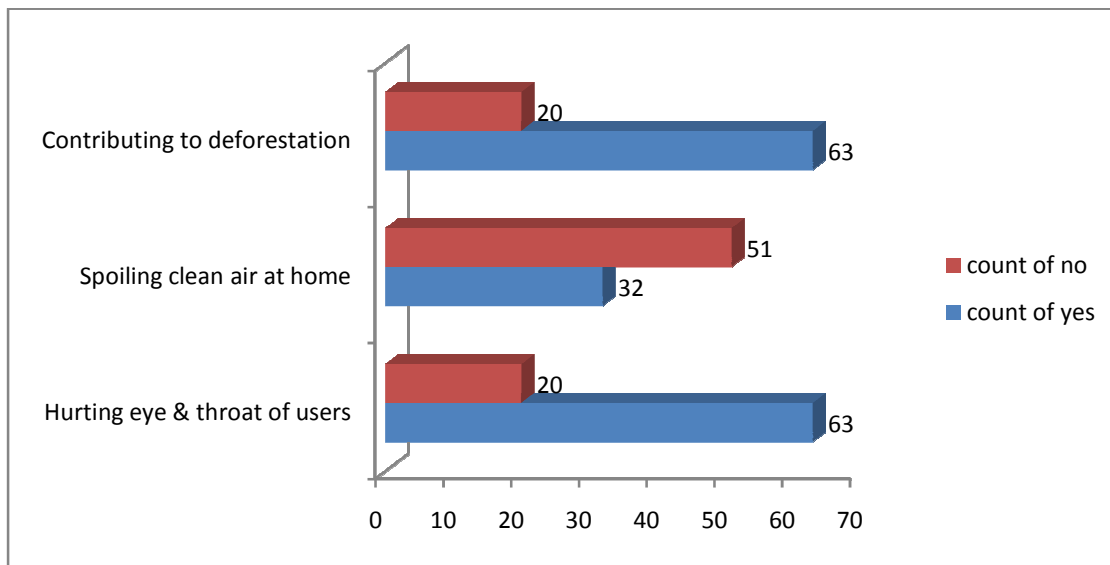


Fig. 5. Disadvantages of non-electric energy sources; Source: Own survey data

Table 6. Comparison of electric power with other power sources in contribution to better health status of people.

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|--|-----------|---------|---------------|--------------------|
| Valid has better health keeping status | 73 | 88.0 | 88.0 | 88.0 |
| has no advantage | 10 | 12.0 | 12.0 | 100.0 |
| Total | 83 | 100.0 | 100.0 | |

Source: Own computation from survey data collected in October, 2013.

4.5.2.COSTWISE COMPARISON BETWEEN ELECTRIC POWER AND NON-ELECTRIC ENERGY USAGE

The majority (84.3%) of the respondents have stated that the utilization of electric power is cost effective as compared to non-electric fuels (Table7).

Table7. Comparison of electric power with respect to cost of other power sources

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|--|-----------|---------|---------------|--------------------|
| Valid It is cost effective | 70 | 84.3 | 84.3 | 84.3 |
| have the same cost as non-electric fuels | 9 | 10.8 | 10.8 | 95.2 |
| It is not cost effective | 4 | 4.8 | 4.8 | 100.0 |
| Total | 83 | 100.0 | 100.0 | |

Source: Own computation from survey data collected in October, 2013.

4.5.2.1.COST IMPLICATION OF GRINDING IN GRAIN MILLS

With regard to cost of grinding in grain mills after electrification, 26.5% of the respondents had stated that the cost has increased but the remaining 45.8% had indicated that the cost was the same as before (Table8).

Table 8.Cost of Grinding in grain mills after electrification

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---------------------|-----------|---------|---------------|--------------------|
| Valid Increased | 22 | 26.5 | 26.5 | 26.5 |
| Reduced than before | 23 | 27.7 | 27.7 | 54.2 |
| The same as before | 38 | 45.8 | 45.8 | 100.0 |
| Total | 83 | 100.0 | 100.0 | |

Source: Own computation from survey data collected in October, 2013.

Several reasons were given for not having cost reduction after electrification. Almost half(50.6 %) of the respondents had indicated that the initial installation cost,especially transformer cost was high. The other half (49.4%) of the respondents had claimed that many people did not seem to understand the proper utilization of electric power.

4.6. RESPONDENTS VIEW ON ACCESSIBILITY OF ELECTRIC POWER

Everyone seems to understand the limited accessibility of the electric power in rural areas. Among the respondents, 80.7% had indicated that there is shortage of supplies like KWHM and the government should avail credit access to the corporation to facilitate shipment of the necessary supplies. The other reason is that the material cost of electric supplies like transformer has been totally unfair.

The other problem was the maintenance of electric system. When a transformer or KWHM is damaged it would not be maintained as soon as possible. It was common for rural people staying without electric power due to shortage of transformer or KWHM supply, as well as, absence of technician at woreda level.

Among the respondents, 86.6% of them had stated that there was frequent power interruption in the area.

According to 79.3 % of the respondents, relatively, the cost of electric power was not that high. This implies that electric power was cost effective when compared to other sources of power in rural areas.

With regard to bill collection system, 57.3% of the respondents had stated that it was properly executed. In general, the electric service in the rural area was not satisfactory.

4.7. Challenges of Rural Electrification in SNNPR

According to UEAP project office, there were so many problems in rural electrification project work and they face so many challenges in implementing the project.

A. There are villages/towns which do not get electric power after the line has been extended, mainly due to:

- Electric power shortage of in the country;
- Delays in up-grading power generations;
- Minimal rehabilitation works and maintenance services of distribution and transmission lines and substations;

- Operational problems, no skilled person and unavailability of logistics like trucks which are important for pole transportation;
- Shortage of supplies, like KWHM, transformers, cables, pole mount fuse /distribution box/.

B. Delays in construction works was due to:

- Inexperienced Contractors;
- Executing large number of transmission and substation projects by own forces with little resources;
- Shortage of construction inputs like poles;
- Shortage of trucks to transport concrete poles;
- Attitudinal problems of project contractors as they do not respect their obligations and deliver less quality construction works;
- Influence of price change of supplies on contractors;
- Occurrence of organizational and structural problems;
- Limited road accessibility;
- Difficulty in laying out electric lines due to right of way problem;
- Conflict with regional officers in the selection of villages/towns;
- Defaulting of contracts by construction companies.

4.8. Contribution of rural electrification in communication and water services

In addition to other services, rural electrification contributes to municipal water and communication development. By using electric power, the rural communities benefit by getting pure water supply. In most cases, where there is no grid line, Ethio-telecom and municipal water services use stand-by generators to supply power at rural sites, according to Ethio-telecom South region operation and maintenance office.

4.9. Contribution of rural electrification to Micro- enterprises

Ethiopia is one of the poorest countries in the world where generalized poverty, low income and productivity, unsustainable growth process, chronic poverty, unemployment, widespread social and economic problems remain to be characteristic feature of the economy (Abu, 2007).

Industry

Industrialization is the process of building up a country's capacity to process raw materials, and manufacture goods for consumption and for export (Sidama ZFED, 2011).

The dominant Economic activity in Ethiopia is agriculture but that does not mean there are not other activities. Like most parts of the country, in Sidama zone, other secondary activities are practiced, such as small scale industries. In Sidama zone, relatively, there were medium and small-scale industries, though there were no heavy industries at zonal level (Sidama ZFED, 2011). Most of the industries in the Zone are light industries, widely

engaging in the production of final goods for consumption, such as, food processing, coffee processing, and animal products (Sidama ZFED, 2011).

Sidama is one of coffee producing Zones in the country. There are privately owned and cooperative coffee pulping and hulling industries due to availability of electric power. Thus, availability of electric power has a big role in the expansion of industries (Sidama Zone ZFED, 2011).

Trade

Generally, there are 4 types of trades: wholesale trade, retail trade, service giving enterprises, and industry manufacturing trade (Sidama Zone ZFED, 2011). According to Sidama zone trade and industry Department office(2011), there are a number of micro-enterprises in the Zone which are working in manufacturing areas, construction areas, and trade, service and Agricultural areas. There are 179 micro-enterprises involved in manufacturing areas, 251 micro-enterprises involved in construction areas, 183 micro-enterprises involved in trade and investment, 294 micro-enterprises involved in service areas and 91 micro-enterprises involved in agricultural areas. These enterprises were highly supported by electric power and without it their operation would have not been achievable (Table 9).

Table 9. Micro-enterprises in sample woredas of Sidama zone, 2011.

| No | Name of woredas | Manufacturing areas | Construction areas | Trade | Service | Agriculture |
|----|-----------------|---------------------|--------------------|-------|---------|-------------|
| 1 | Awassazuria | 11 | 15 | 21 | 21 | 4 |
| 2 | Boricha | 6 | 3 | 8 | 9 | 7 |
| 3 | Gorche | 4 | 4 | 7 | 7 | 8 |
| 4 | Malga | 5 | 4 | 8 | 10 | 7 |
| 5 | Arebegona | 8 | 11 | 12 | 15 | 6 |

Source; -Sidama zone trade and industry Department office, 2011

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATIONS

Even though a certain level of access to electric power is available in rural areas, most of them do not use electric appliances in their home. So, rural people should be made aware to the value and use of electric appliances.

Most rural people depend on wood, coal, 'kubet' and kerosene for cooking purposes. Since these fuel sources contribute to deforestation, hurts eyes and throats of users, pollutes the environment. To use diesel fuel using generators it requires high foreign currency.

For rural people to make use of electric appliances, such as stove and electric 'mitad', micro- enterprises should create access to credit to farming communities.

Since grid supplied electric power has the advantage of providing quality life, better health keeping status, time and cost effective than other fuel sources, the NGOs and stakeholders should support the rural community in creating access to electric appliances.

Even though access to electric power has shown improvement, most people were not benefiting due to shortage of supplies like KWHM, transformers and cables, lack of awareness and high initial cost to install KWHM. In order to create access of electricity to all in rural areas, all stakeholders should join hands to facilitate the availability of electric services.

In rural settings, there is a problem of high power interruption and damaged lines are not maintained immediately. These problems can partially be rectified by assigning technicians in each Woreda.

Rural electrification faces a number of challenges and quality problems: distribution and establishment of transmission lines, shortage of power in substations, absence of rehabilitation, shortage of supplies like transformer, KWHM and accessories, concrete poles and trucks for transportation, shortage of skilled manpower in rural woredas and kebeles, less experienced contractors, influence of inflation on contractors, a highly centralized structure system and lack of commitment with contractors to accomplish the project.

So, to make electric power accessible to rural areas, power generations and substations should be up-graded; transmission and distribution lines should be rehabilitated; training should be given to contractors and sub-contractors in order to solve network quality problems. The structure should be decentralized and service centers should be opened at woreda level.

The availability of electric power contributes to the establishment of micro-enterprises, manufacturing and construction industries, which in turn creates job opportunity for many by contributing toward poverty reduction and limiting migration from rural area to cities.

REFERENCES

Elizabeth Cecelski (1982).Energy in Developing countries series: The role of Rural Electrification in Development, Washington, D.C.

Ethiopian Electric Power Corporation (2010).Impact Assessment of Universal Electrification Access Program,Ethiopia.

Ethiopian Electric Power Corporation (2010/2011).Facts in brief, Brochure, Ethiopia.

Economic Consulting Associates, Fichtner, AHS Electric (2013).National Electrification Program Prospects for Ethiopia, Ethiopia.

Emmanuel Bergasse(2013).The relationship between Energy and Socio-Economic Development in the Southern and Eastern Mediterranean, MEDPRO Technical Report No.27.

Finance and Economic Development Department Development Data Collection and Dissemination Work Process (2011).The Socio-Economic Profile of Sidama Zone,Hawassa,Ethiopia.

JanBojo(2003).Poverty Reduction Strategies and the Millennium Development Goal On EnvironmentalSustainablity: Environmental Economic Series,Washington,D.C.

Judiths.Gonzale(2010).Enviromental sustainable Development,China.

Kirubi,C.etal(2009).Article in Press:Community-Based Electric Micro-Grids can contribute...,World Development.

Ministry of Finance and Economic Development (2002).Sustainable Development and Poverty Reduction Program, Ethiopia.

Ministry of Finance and Economic Development (2005).The Millennium Development Goals (MDGs) Needs Assessment Synthesis Report, Development Planning and Research Department, Ethiopia.

Ministry of Finance and Economic Development (2005) .Sustainable Development and Poverty Reduction Program (SDPRP I:2002/03 to 2004/2005): Retrospective and the way forward ,Development Planning and Research Department ,Ethiopia.

Maxwell Mapako and Gisela Prasad(2007).Rural Electrification in Zimbabwe Reduces Poverty by targeting income-Generating activities, CSIR Natural Resources and the environment, and Energy Research Center, University of Capetown, South Africa.

Moges,Abu G.(2007).The political Economy of Poverty Reduction in Ethiopia,Japan.

Ministry of Finance and Economic Development (2010).Growth and Transformation Plan (GTP 2010/11-2014/15),Ethiopia.

P. Cook. (2013). Rural Electrification through Decentralized Off-grid Systems in Developing Countries: Green Energy and Technology. Impact on Access and Affordability. University of Manchester, Manchester, UK

Sidama Zone Trade and Industry Department (2013).Micro-enterprises data (2005-2013), Brochure, Hawassa. Ethiopia.

Tecsult International Limited (2006).AfDB financed Rural Electrification Project: Rural Electrification Access Study, Ethiopia.

Taryn Dinkelman. (2010). Effects of Rural Electrification on Employment: New evidence from South Africa. University of Princeton.

Universal Electrification Access Program (2013). Planning and Environmental Monitoring Office-Defining Electricity Access, Ethiopia.

Universal Electrification Access Program (2013). Assessment report, Ethiopia.

Annexure III

QUESTIONNAIRES AND INTERVIEW QUESTIONS.

Rural electrification is important part of improving the life of rural people.

Electricity is directly related to the economic progress of a community and nation.

In moving towards development, it is important to conduct ground studies on Socio-economic contribution of Rural electrification in SNNPR, the case in Sidama zone, by selecting five woredas, namely, Awassa zuria, Boricha, Gorche, Guguma and Arebegona.

Thank you in advance for your much willing participation and for taking the time to provide me with this important information.

Questionnaire for customers

I. Personal information

1. Gender: A. Male B. Female

2. Age A. 18-25 B. 26-30 C. 31-35 D. 36-40

E. 41-46 F. above 46

3. Address A. Name of woreda-----B. Name of kebele

4. Level of education

A. Below grade 10

B. 10-12 complete

C.TVET graduate

D.College diploma

E.Degree

F .Masters degree and above

5.For how long time you have been using electric power?

A.Below one year

B.1-2 year

C.2-4 year

D. above 5 year

6. Do you use electric appliances in your home?

A. Yes

B.No

7. If you use electric appliances in your home, what type of electric appliances do you use?

A. Electric stove

B. Electric 'mitad'

C. Mobile charger

D.Refrigerator

E.Television

F. Satellite dish

8. If you do not use electric appliances, what are your sources of fuel cooking in your home?

A. Fire wood B. coal C. Dung D. Kerosene E. Please mention if any other-----

9. If you use fire-wood, coal, dung, and kerosene for cooking purpose in your home, what are the disadvantages of these fuel sources?

A. Hurting eye and throat of users

B. Spoiling clean air at home

C. Contributing to deforestation

D. Please explain if any other-----

10. How do you compare electric power with non-electric power sources like fire-wood, coal, Dung, and kerosene?

How do you compare electric power with non-electric power sources in saving time?

A. It is time saving

B. It does not save time

How do you compare electric power with non-electric power sources in keeping health of users?

A. It has better health keeping status

B. It has no advantage

How do you compare electric power with non electric power sources with respect to cost?

A.It is cost effective

B.It is not cost effective

C. Have the same cost

11. How do you judge the price of grain miles after electrification?

A. The price increased

B. The price reduced

C. The same as before

12. What are the reasons why people around you do not get electric power?

A. Because the initial electrification cost is so high

B. Because people do not understand the use of electric power

C. Mention if any other-----

13. What do think should government and other stakeholders do to create access to the population?

Please explain in detail-----

14. What are the problems in service part?

A. Power interruption

B.High cost of electric power

C.Maintenance problem

D.Mention if any other-----

15. Is the current bill collection system appropriate?

A. Good

B. Not good

16. Mention the problems in bill collection system in detail-----

Interview questions for water service office and Ethio-telecom Operation and maintenance office.

1. What are the contributions of electric power with respect to your office especially in rural areas?

2. How do you compare the use of electric power with non-electric fuel sources like, fire-wood, coal, dung and kerosene?

Interview questions for investment office.

1. What are the contributions of electric power for micro-enterprises especially in rural areas?

Interview questions for South region UEAP project office.

1. What are the challenges in rural electrification?

2. What do you plan for electric power inaccessible woredas and kebeles?

The following questionnaire is filled by rural people with local language.

SÖÄp

¾ÑÖ` ¾Sw^f ›ÑMÓMÓKAf KÑÖ\ I'w ¾<a ShhMfMp ›e}ªê* ^"ÇK- Äq "nM::

¾?K?;f]; ÁM KTIu[cw^"Ç=G<U KGÑ' ¾=ç*T> °ÉÑfkØ}— ¾j' ›e}ªê* ›K-::uSj'<U "Á °ÉÑf ÔÇ“ ^¾}Ö” vK”uf "pf
 ¾?K?;f]; ÁM u}KÁ uÑÖ` ›"vu= Áu{Y}”›e}ªê* ^"Ç=G<U u-ÑMÓMÓKAf ›c×Ö< LÄ ÁK<uf” ›Ó` TØ“-
 ›eðLÑ>uSj'<uc=ÇT µ” -eØuT>Ñ-< ›U•f “[Ç-< LÄ KØ“- ¾T>ÖpS< S[í-< ÁcucvK<:: u²=IU Sc[f ^`e- KT>cÖ<” S[í
 upÉT>Á UeÖ“ ^Ák{w” ¾T>VK<f S[í u×UÖnT> Sj'<”][É]” SÖÄI” uØ”nouT”uw“ uS[Çf^”Ç=VK<M”“ ›T^ß K}ç†-
 ØÁo-< ¾T>eTS<uf” U'Y ÄI”” UM;f()

1.

2.ÉT@ Ý18-25 Ý31-35 Ý36-40 Ý41-46 Ý46 uLÄ

3.¾T>+{uf”[Ç eU-----¾kuK? eU-----

4.¾fUI'f Ä[í

G.Ý 10— jðMuq;

K.10-12— jðMÁÖ“kk;

N.Ý{i'>” S<Á TcMÖ— ¾}S[k/;

S.¾çK?ï ÉKAT ÁK-/ÁLf

W.uÉÓ] ¾}S[k/;

c. Te••• ÉÓ]“ ••• uLÄ ¾}S[k/;

5. ¼Sw^f ›ÑMÓKAf }ÖnT> Ýj'< U" ÁIM Ñ>²? J'-f;

G.Ý 1 ˘Sf u•<

K.1-2 ˘Sf

N.Ý 2-4 ˘Sf

S.Ý 5 ˘SfuLĂ

6. uu?f- -eØ ¼?K?;f]i °n-«" ĂÖkTK<;

G. •ÖkTKG< ÖkUU

7. uu?f- -eØ ¼?K?;f]i °n-«" ¼T>ÖkS< Ýj' ¼T>ÖkJ†- ¼?K?;f]i °n-« U" U" "†-;

G.¼?K?;f]i UÉÍ/e,{/

K. ¼?K?;f]i U×É

N.¼VvĂM %o'É`

S.Tk'k' /ö]l/

W.}K?y=>"

c.Ç=i

8. ¼K??;f]i °n-«" ¼TĂÖkS< Ýj' KUÓw TwcÁ'f ¼T>ÖkS<f uU"É" '-;

G.u^"Úf M N.uÝ< S. uÒ' UÉÍ

W.K?L ÝK ĂÑKé-----

9. u}^ lØ' 8. LĂ ¼}²[²\}f" KUÓw TwcÁ ¼T>ÖkS< Ýj' U" U" Ñ<Çf }L†-;

G. ¼-Ă"" ¼S}"ðh }ÝLf ISU

K. "lC }¼' }KTÑ-f

N. ¼Ă" SÚóúó

S. K?L ŸK ĀŃKé-----

10. ¼?K?if]i °n-° ¼T>ÖkS< Ÿj' <kĀU c=M KUÓw TwcÁ'f c=ÖkS<v†- Ÿ'u\|f(Ÿ'Úf&ŸcM&Ÿ<uf^" Ò') Ò' c='éi' ŸŃ>2?&ŸÖ?" ^"
Ÿ"Ū ,°é' c=qĀ ,?K?if]i" SÖku:-

Ń2?" :G.ĀqØvM ØwU

KÖ?" : G.¼}hK ØpU :K- K 4K-U

"Ū: G. ĀqØvM ØwU N. "Ū }Sdd

11. Sw^f ŸSÓv- uòf" u%EL K"òà ,ŃMÓKAf ¼T>ŸöK<f jòÁ

G.¼,ŃMÓKAf °ò úubM K. ÓKAf °ò k"dDM N.U"U ¼°ò K-

12. ^e- ¼?K?if]i ,ŃMÓKAf }ÖnT> '-f&^e- uT>*\uf ,Ÿvu= K?KA, ÓKcx, ¼Sw^f }ÖnT> ÁMJ'<uf U;"Áf U"É" '-;

G.Sw^f ¼TeŃu=Á °ò Ÿö}— SJ"

K.¼Sw^f" ØpU ¼S[Çf Ó"au? ,°e}— SJ"

N.K?L U;"Áf •K ĀŃKé-----

13. ^e- uT>*\uf ,Ÿvu= G<K<U ÓKcx, ¼Sw^f ,ŃMÓKAf }ÖnT •>"Ç=' <S"Óef ^" K?KA, vKÉ'h ,ŸLf U" U" TÉ[Ó :Kv†- wK-
ÁevK<;u^^ ĀŃKé-----

14. uSw^f ,ŃMÓKAf :c×Ø LĀ U" U" :Ó' :Kw-;

G. ¼Sw^f Sq^[Ø

K. ¼,ŃMÓKAf jòÁ °ò Ÿö}— SJ"

N. wMif „KA ÁKSÖ•"

S. K?L ŸK ĀŃKé-----

15. uŃ"2w :cvcw /;ŸóðM/2<]Á LĀ ,G<" ÁK- :c^

G.Ø\ '→ ÅÅKU

16. uÑ"²w >cvcw ²<]Á LÃ <Óa< >K< •K< u"ˆ ÑÓKè-----
