

# Effect of Rural Electrification on Economic Growth for Small and Medium Enterprises in Bugesera District; Rwanda

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**Abstract:** The purpose of this research dissertation was to examine effect of rural electrification on the economic growth of districts in Rwanda by taking Bugesera district. The researcher used three specific objectives to achieve the purpose of the study, objectives are: to find out the multiplication of SMEs on economic growth in Bugesera district, to establish the new services by SMEs on economic growth in Bugesera district and to determine enhanced production efficiency in SMEs operations on economic growth in Bugesera district. The results of the study would help to identify gaps within the rural electrification in Rwanda. The study would be added to the existing knowledge to Rwanda Energy Group Limited (REG) regarding rural electricity supply. This study could influence and encourage rural people and promote the productive use of electricity in generation of income through small and medium enterprises. The researcher used descriptive case study research based on qualitative and quantitative approaches in order to get a better insight of the study. The study thus concluded that putting proper rural electrification control and management in terms of multiplication of SMEs, new services by SMEs and enhanced production efficiency in SMEs district respectively would increase economic growth in terms of employment creation as well as in terms of high industrial production in Rwanda. The researcher suggested the following recommendations; Government should ensure availability of electricity in rural areas that would result in efficiency and effective services of the small business in the district.

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## 1. GENERAL INTRODUCTION

### Background of the Study

The world has seen significant progress in bringing electricity to remote rural areas. Central to this has been the role of governments, especially from developed nations, where efforts have been put to help bring electricity and improve living standards of people living in rural locales. The United States, for example, rolled out rural electrification programmes as early as 1930s as a way of improving growth rates of its suburbs and helping to create a more integrated national market (Malone & College, 2010). Similarly, it has and continues to be the intention of other governments around the world to increase the use of electricity in rural and peri-urban areas.

In India, electricity is not only used for household purposes but it also allows mechanization of many farming operations, such as threshing, milking, hoisting grain for storage. A famous program New Deal's Rural Electrification Administration in the United States pioneered many of the schemes still practiced in other countries. India adopted rural electrification programmes and build new ones in order to provide 400 million Indians electricity in rural India. Before Pradhan Mantri Gram Yojana bloomed with notable results, rural electrification was going south due to major crisis. Challenges were faced during 2010-2014 electrification, and things were in bad shape when it came to making progress. Rich states provided some number of villages with power but poorer states still struggle to do so. Although things progressed a bit there were still problems faced such as non-uniformly electrified, poor planning, electricity theft, poor infrastructure for electrical transmissions, lack of political will, incomplete coverage, faulty/Incomplete Data, time consumption & difficult procedure and low demand & low consumption, (Barnes, D. F. 2012).

The rural electrification is based on renewable electrification is based on renewable energies in developing countries promises a cleaner, cheaper and more democratic way of improving the quality standard of remote areas of the world's

population. Therefore, we created India's most efficient ceiling fan that consumes just 28Watts. India's non-electrified population will be enjoying electricity without having to make any changes in its generation, (Sachs, 2005).

According to Karekezi and Kithyoma, (2002) states that governments have supported the development of rural electrification programmes on their own or through partnership with private electricity utility firms as a way of providing energy to rural areas. Despite the pivotal role that energy, particularly electricity plays in national economic development and providing services that in turn enhance social development, developing countries have not achieved much when compared to developed nations that flagged off rural electrification programmes in early years of 19<sup>th</sup> century in United States.

The cost and difficulty of providing electricity to rural areas in developing countries has left an estimated 1.6 billion people worldwide without the benefits of electricity in Britain (Barnes, 2012). Despite the substantial progress made towards the realization of sustainable development in the last decade, availability, accessibility and affordability of electricity for all people is still a major challenge around the world. Rural electrification has been recognized as a key ingredient in poverty reduction and the enhancement of social and economic development. In the past decades, access to electricity in the rural and peri-urban areas has been a key challenge and this has in turn led to slow social and economic development, (Sachs, 2005).

Abdullah and Markandya, 2012 stated that insufficient attention to rural electrification in the Rwanda by the government has contributed to the widening gap in electricity access between the rural population and urban population (Abdullah and Markandya, 2012). The trend has occurred in almost all the developing countries where the respective governments have struggled with the issue of low electrification rates in their rural areas. Electricity use in rural areas can be categorized as household electricity, electricity for agriculture and electricity for small and medium enterprises (Karekezi and Kithyoma, 2002). According to Tuntivate (2011), access to electric lighting in rural areas can increase the quantity and quality of agricultural products and the use of electricity powered tools and equipment such as refrigerators and freezers can make it possible for small and medium enterprises to produce more goods and services in Britain.

There is a general consensus that small and medium enterprises are crucial in the socioeconomic development of a nation. This is attributed to the fact that small and medium enterprises contribute significantly to a country's gross domestic product (GDP) through the consolidation and mobilization of scarce resources to the needs and demands of fragmented domestic markets (Sachs, 2005; Kirubi, 2006). Similarly, the small and medium sector enterprise sector has been recognized as key enabler and contributor to employment, innovation and economic dynamism hence playing a crucial part in the growth of healthy economies. However, most small and medium enterprises in developing countries have encountered several challenges and inadequacies such as technological backwardness, low production efficiency and poor quality of products (World Bank, 2003). Compared to larger firms, small and medium enterprises suffer from various infrastructural challenges that hamper their growth and development in Britain.

However, the governments of most developing countries have recognized the positive contribution of small and medium enterprises to the economy and have since began to develop several policy initiatives geared towards the growth and expansion of small and medium enterprises and for the improvement of their technological capability and market competitiveness (Tuntivate, 2011). The promotion of small and medium enterprises is considered as a vital and pertinent strategy to sustainable development, alleviation of poverty, increasing employment and raising the standards of living (Mbatia, 2005). One of the policy measures that developing countries are currently pursuing in a bid to enhance growth and expansion of SMEs is electrification of rural areas. In the last decade, Rwanda has embarked on a national policy aimed at building the capacities of SMEs through the rural electrification projects in Nigeria, (Abdullah and Markandya, 2012).

The Nigerian Rural Electrification Agency (REA) was created by the Electric Power Sector Reform Act in 2006. The agency exists to facilitate the provision of affordable power supply for residential, commercial, industrial and social activities in the rural and peri-urban areas of the country. Underscoring the importance of government cooperation and commitment, he added that the cooperatives rely on strong partnerships among governments, rural/local communities and development partners for implementation and success. The study, funded by the South-South Cooperation Trust Fund, will be conducted by the National Rural Electric Cooperative Association (NRECA) International over three months. NRECA will consider regulatory, legal, technical, and socio-economic factors that impact the creation of electric cooperatives in the two nations. Electricity cooperatives are tax-exempt businesses set up and owned by the consumers who benefit from the services provided in generation, transmission and/or distribution. They are used in many parts of the

world to provide last mile connections to rural areas through grid extensions and cooperative enterprises. Where successful, they also improve rural electrification, while creating sustainable businesses (Tuntivate, V.T 2011).

In 2015, the Government of Kenya (GoK) announced the « Last Mile Connectivity Program » aiming at universal access to electricity by 2020. Increase access to reliable electricity for households and businesses; Improve economic development in Kenyan rural areas; Reduce disparities between rural and urban areas. Access to electricity in Kenya is notably low in comparison with similar African countries: 35 % on average and only 12% in rural areas have access to electricity. In 2015, the Government of Kenya (GoK) announced the « Last Mile Connectivity Program » aiming at universal access to electricity by 2020. This new ambitious strategy based on international good practices and experiences will allow large economies of scale. The Project is part of this ambitious goal allowing thousands of connections for households close to the electricity network in 33 counties (out of 47) spread in rural areas of Kenya. The main objectives of the project are to : Increase the number of connections around distribution transformers and extend the MV and LV distribution grid where needed in Kenyan rural areas; increase access to reliable electricity for households and businesses; improve economic development in Kenyan rural areas; reduce disparities between rural and urban areas,(Barnes,2012).

Since 2003, the government of Rwanda embarked on a robust rural electrification projection that is aimed at providing electricity to the rural population. The rural electrification project in Rwanda was boosted through the creation of Rwanda Energy Group Limited (REG) in 2006 that has devised a raft of strategies involving the use of grid and off-grid supply systems through diesel stations and other renewable energy sources such as wind, solar and biogas (REG, 2013). Recent statistics indicate that rural electrification in Rwanda increased from 4 percent in 2003 to 12 percent in 2010. While estimates of the new connection rate in the last two years are difficult to confirm, it appears that the new rural electrification rate has surpassed 15 percent and this represents more than 12,904 public institutions in rural areas namely, trading centres, public secondary schools and health centres (Ondari, 2010).

The goals of Vision 2030, namely, poverty reduction, economic growth, job creation, education and health cannot be achieved without adequate, affordable and reliable electricity across the country. Electricity is one of the primary drivers of all sectors in Rwanda including small and medium term enterprises and hence the need to provide electricity to every part of the country (Ng'ang'a, Onyango and Kerre, 2009). The government of Rwanda has re-affirmed its commitment to promoting small and medium enterprises in the country due to their significant contribution to the national GDP and employment. The government commitment to enhancing the growth of SMEs in Rwanda include the strengthening of financial and non-financial markets to meet the demand of SMEs, strengthening institutional support for employable skills and business and reducing critical investment constraints on SMEs. This is evidenced by the major strides that the government has taken to invest in electricity, water and roads in various parts of the country.

Consequently, the government of Rwanda has made deliberate efforts to decentralize most of its development project in the recent years. Most of these development projects are aimed at meeting the millennium rural development goals and Vision 2020. In order to advance development of projects at lower levels, the government has instituted various devolved structures and funding regimes such as rural development. Through the rural electrification levy fund, trading centres and smaller towns distributed across Rwanda have received electricity. Bugesera district is one of the districts in Rwanda that has benefited from the devolved fund from government through the rural electrification.

According to latest data from Rwanda Energy Group Limited (REG), Bugesera district received electricity connectivity in all areas within Bugesera constituency in order to achieve long term sustainability and socio-economic development (REG, 2013). As a result of funding from the government through Rwanda Energy Group Limited (REG) and renewed priority to rural electrification and provision of electricity services, most areas in constituency including Bugesera town have benefited. Rural electrification has gone well in Bugesera as evidenced by the usage of power in homes, schools, business enterprises and government institutions. Currently, electricity is supplied in Bugesera through off-grid (private entities) and grid sources (government /public).

### **Statement of the Problem**

In spite of the importance, contributions and potential of micro-enterprises in the Rwanda economy, there are several factors that impact on their growth. One of the factors, is connectivity to grid electricity services, because without available and reliable electricity services there is no possibility of utilizing modern electrical appliances, such as fridges, gas cookers, welding kits, and machinery which may pave the way for small and cottage industries. There is also no convenient lighting in businesses such as bars and retail shops, which reduces the number of customers, (Mohatt, Bradley, 2005).

Rural areas continue to be the home to majority of the population in Rwanda and also the hub of small and medium enterprises. The lack of electricity supply affects close to ninety (90) percent of the population (Abdullah and Markandya, 2012). Despite, the impressive gains the government has made in providing electricity to populations living in rural areas, Bugesera has not yet achieved the universal electricity coverage and even in areas where the rural electrification program have been rolled out fully, a section of the population have not shifted. Consequently, reliable data on the impacts of rural electrification program on businesses and trends on the productive use of electricity in Bugesera are not available. Digital technologies enable SMEs to improve market intelligence and access distant markets and knowledge networks at relatively low cost, and stronger participation in international activity can boost SME growth. However, SMEs are lagging behind in the digital transition and are disproportionately affected by trade barriers, deficient intellectual property protection, and quality of infrastructure, lack of electricity and institutions.

The government of Rwanda together with other private partners and donors has played a crucial role in the provision of electricity to rural areas in a bid to spur human, social and economic development in the country. Rural electrification has been identified as a key stimulant of small and medium enterprises in rural areas. The government of Rwanda through its energy utility agency, the Rwanda Energy Group Limited (REG) committed itself to providing electricity to all trading and health centres in rural Rwanda by June 2013 (New times: May 06, 2019). Rural electrification may create opportunities for small and medium business activities in rural areas to grow and flourish. This study therefore seeks to assess the effects of rural electrification on the economic growth of Rwanda as case study of small and medium enterprises in Bugesera district.

### **Specific Objectives**

To achieve the main objective, the study focused on the following specific objectives.

- i. To establish the effect of multiplication of SMEs affect economic growth in Bugesera district.
- ii. To establish the effect of new services by SMEs on economic growth in Bugesera district.
- iii. To investigate the effect enhanced production efficiency in SMEs operations on economic growth in Bugesera district.

## **2. LITERATURE REVIEW**

### **Theoretical Review**

#### **Contingency Theory**

Contingency theory suggested that rural electrification should be designed in a flexible manner so as to consider the environment and organizational structure confronting SMEs. Rural electrification also needs to be adapting to the specific decisions being considered. In other words, rural electrification needs to be designed within an adaptive framework.

The first paper to specifically focus on the contingency view of rural electrification in the rural development literature was "A Contingency Framework for the Design of rural electrification," (Bakar, 2000). This paper laid out the basic framework for considering rural electrification from a contingency perspective.

Pandey et al (1996) concluded that environmental uncertainty is a fundamental driver for designing management rural electrification among successful organizations. A key finding in this study was that, as decision makers perceive greater environmental uncertainty, they tend to seek more external, nonfinancial and ex ante information in addition to internal, financial and ex post information. This latter finding has been confirmed by several studies that followed the Gordon and Narayanan paper.

#### **Behavioral Theory**

Early behavioral theory electrification research explored bivariate relations between control system characteristics (for example; reliance on rural electrification performance measures or improved electricity supply) and various criterion variables (e.g., performance or dysfunctional behavior). Behavioral theory rural electrification research evolved rather quickly, however, to more complex contingency models of the organization with a richer view of the organization and of individual behavior. The fundamental premise of contingency theory research has been that organizational structure and control system design is related to organizational context. Thus, the effects of rural electrification characteristics are moderated by contextual factors which impact the individual and the financial organization, (Jensen and Meckling, 1976). Specific characteristics of the rural electrification supply must be matched to the contextual variables that define the economic development environment. The (often implicit) assumption is that a better match is positively related to

economic development (Gerry and Kevan, 2003). Existence of behavioral theory on rural electrification and this leads to increased small and medium enterprise therefore this study thus will use this model to determine the effect of rural electrification on economic development in terms of employment creation by SMEs and higher industrial production in districts of Rwanda.

### **Development as Freedom Theory**

The question that follows such exposition of theories as presented above is why then does development not take the trajectories as intended by policy makers given the understanding of the theory and practice of Structuration? Armatya Sen argues that individual agency is not real if the freedom is absent or in other words constrained freedom cannot realize desired development trajectories. In his book 'Development as Freedom' (1999) he outlines what he sees to be freedoms, which entail rights such as education, life and public participation. This paper identifies with this theory in realization that no matter what effort is exerted to harness opportunities presented by structures, if the said effort is not informative, free or in an environment that is secure, then that effort is wasted and cannot yield great results. What baffles at this point is what Armatya's conceptualization of development is, given the growth levels witnessed in countries that are deemed to be constraining freedoms such as China and more near and Rwanda. The question is, are Busesera people free to use the opportunities that come worth the rural electrification? Have all the enabling components such as political goodwill positive enough and in support of the developmental initiatives influenced by rural electrification programme. Development as freedom theory on rural electrification and this leads to increased small and medium enterprise therefore this study thus will use this model to determine the effect of rural electrification in terms of multiplication of SMEs, new services by SMEs and enhanced production efficiency in on economic development in terms of employment creation by SMEs and higher industrial production in districts of Rwanda.

### **Socio - Economic Theory**

Sutinen and Kuperan (1999) propounded the socio-economic theory of compliance by integrating economic theory with theories from psychology and sociology to account for moral obligation and social influence as determinants of individuals' decisions on compliance. According to Lisa (2010) psychological perspectives provide a basis for the success or failure of organizational compliance. Wilmshurst and Frost (2000) also add that the legitimacy theory postulates that the organization is responsible to disclose its practices to the stakeholders, especially to the public and justify its existence within the boundaries of society. This theory, which focuses on the relationship and interaction between an organization and the society, provides a sufficient and superior lens for understanding government procurement system (Hui, et al., 2011). From this theory, we can understand the policy, planning and sustainable procurement practices in public institutions and their influence on service delivery to the society. Existence of Socio Economic Theory view of rural electrification and this leads to understanding of rural electrification in relation to Socio Economic development therefore this study thus will use this model to determine the impact of rural electrification on economic development in districts in terms of employment creation by SMEs and higher industrial production.

### **Empirical Review**

A study conducted by the World Bank in the Philippines revealed that small home businesses were more active in areas with electricity (World Bank, 2008). Evidence from a number of national-level studies shows that rural electrification provides similar results. Rural electrification has the potential of improving the quality of life of rural life in various ways. The energy demand is rapidly growing throughout the developing world where there is increased need for energy to support various services like domestic and small scale services (Abdullah and Markandyab, 2012; Barnes, 2012). In order to enhance electricity access to rural areas, several of the developing countries have undertaken a number of policy and institutional initiatives. However, Rural electrification programs in developing countries have faced major obstacles that are associated with low population densities in rural areas that have resulted in high capital and operating costs for electricity companies; low electricity consumption as a result of poor consumers (Singh and Ali, 2001); interferences on the orderly planning and running of the electricity supply by politicians always insisting on favoring constituents; and interference by local communities and individual farmers in providing space for the construction and maintenance of electricity lines (Barnes, 2012).

In Rwanda, the government has fostered rural electrification in the country using grid and offgrid supply through diesel stations or renewable energy sources such as the solar, wind and biogas. The Rural Electrification Authority (REA) that was established in 2003 has been on the fore front in the provision of the electricity to rural populations (Abdullah and Markandyab, 2012). The government continues to connect electricity to most public institutions in the rural areas such as

trading centers, public secondary schools and health centers due to their significant role in achieving rapid growth (Ondari, 2010). Contrary to earlier speculation that the future of rural electrification in Kenya is bleak (Otieno and Awange, 2006), it can be clearly stated that it has greater prospects given the increased commitment from the government to expand the process.

There is a large and growing body of literature on the role of micro, small and medium enterprises in the growth of per capita income for various national economies. The strategic importance of small and medium enterprises (SMEs) in national economic development is widely recognized in both the developing and developed countries (Moha, Abdullah and Bakar, 2000). Recent research has also suggested that small and medium enterprises play an integral role in promoting economic growth in developing countries.

#### **Multiplication of SMEs and Economic Development**

A study focusing on the effects of rural electrification in Abuja state in Nigeria, conducted by Abegio and Okefe (2009) revealed the growth of micro, small and medium enterprises is positively associated with the existence of basic infrastructure such as roads, modern energy and information and communication technology. Infrastructure affects growth through a number of channels both direct and indirect. The most evident direct link is often through the productivity effect, where an increase in the quantity of infrastructure is expected to raise the productivity of other factors. On the other hand, the slowness to extend electricity to rural areas in a wide range of developing countries either through grid extension and off-grid or stand-alone grid approaches have resulted in slow or zero growth of business ventures.

Consequently, a study conducted by Singh (2009) found out that businesses in rural areas of developing countries with access to electricity such as home businesses, small commercial shops, grain mills, saw mills, coffee and tea processing, brick kilns and other small scale enterprises can benefit from rural electrification programmes. Rural areas without electricity have worse record of business development when compared to rural areas provided with electricity.

According to Onyango (2009) also suggested that small and medium enterprises play an integral role in promoting economic growth in developing countries. A study carried out by Leegwater & Shaw (2008) found out that developing countries with larger share of small and medium enterprises have higher economic growth when compared to their counterparts. With lesser share SME's recognition of the integral role that SMEs play in national economic development is as a result of their perceived importance in enhancing forward and backward linkages in economically diverse sectors of the economy (Ng'ang'a, and, Onyango 2009; Kerre, Nummela, 2010). According to (Vandenberg, 2009) SMEs can enhance economic development in developing countries by employing more workers per unit of capital when compared to large enterprises and can contribute towards the achievement of more equal income distribution in society.

#### **New Services by SMEs and Economic Development**

Singh and Ali (2001) stated that a general consensus that SMEs have an important role in contributing to socio-economic development and poverty reduction. Growth can also be viewed in relation to employment, since small and medium enterprises, constitute a major source of employment and generate significant domestic and export earnings. Since SMEs have great potential for job creation, their growth gradient can also be based on the employment opportunities that such enterprises create. Rural electrification access can improve the quality of life, rural productivity and profitability of SMEs.

The need for increased investments in rural infrastructure and other key public service that are necessary for achieving growth and reducing poverty in rural areas has been underscored by various stakeholders. Singh and Ali (2001) have reiterated that government expenditure on rural telecommunications, electricity and roads can have substantial impact on rural poverty reduction. It is estimated that more than two billion people live today in energy poverty, without the benefits of electricity. Rural electrification has gained prominence in recent years with the heightened interest in infrastructure in relation to the core part it can play in improving welfare and reducing poverty (Fishbein, 2003; Singh and Ali, 2001; WorldBank, 2008). In the last two decades, poverty reduction has been a major policy focus in the development circles. Consequently, Ondari (2010) suggested that the international development agencies have officially recognized poverty as a core issue and this is evidenced by putting poverty as one of the millennium development goals. This is a sure recognition that infrastructure has a close relationship to the level or stage of development of a particular country. The role of modern energy in poverty reduction has been documented by various studies. Ondari (2010) asserts that no country in the developing world has ever achieved 8 – 10 percent annual growth that is required to reduce poverty without modern energy. The highest poverty levels in rural areas of Rwanda highlight the importance of investing in basic infrastructure such as electricity, as part of the national development agenda (Otieno and Awange, 2006).

### **Enhanced Production Efficiency in SMEs Operations and Economic Growth**

According to Cook, (2012) conducted a study and stated that uptake in the electricity has the potential of creating new opportunities and a more level playing for SMEs owners to enhance and expand their business. Consequently, concerted efforts to support SMEs through access to electricity service can play integral role in terms of business growth as a result of network and cluster development. Furthermore, as a result of the clustering of SMEs in township and populations centres, the urgent needs of such areas can be met and addressed effectively. Growth of SMEs can also be based on the extent of forward and backward linkages that are linked to such enterprises. On the other hand, uptake of electricity can spur growth of SMEs in terms competitiveness and further accelerating the shifts towards more sophisticated and value added industrial structure through technology development and, product upgrading quality improvement. Moreover, SMEs can enhance their market competitiveness at home and abroad through electricity access and further opening new avenues and opportunities for growth.

Competitiveness is considered by all countries to be a prerequisite for maintaining high levels of income and employment. Greater competitiveness allows developing countries to diversify away from dependence on a few primary-commodity exports and move up the skills and technology ladder, this being essential in order to sustain rising wages and permit greater economies of scale and scope in production. Competitiveness can be assessed at either the national or the enterprise level. At the national level it has been defined as a nation's ability to produce goods and services that meet the test of international markets while simultaneously maintaining and expanding real incomes of its people over the long term. The ability to compete in international markets is usually thought to be dependent on macroeconomic policies and conditions (trade policies and exchange rates etc.) as well as on a nation's comparative advantage, that is its factor endowment (land, labour and capital). There are a few exceptions to this. For example, Singapore became the most competitive country in the world by adopting far-sighted policies that invested in institutions and human resources and attracted foreign direct investment (FDI) in order to make up for its lack of natural resources and capital, (Barnes, D. F. 2012).

It is generally believed that technology development plays an important role in economic competitiveness. However, economists have commonly been wary of, and sometimes openly hostile to, the joining of economic analysis with detailed discussions of technology issues (Efendioglu, 2001). The empirical approaches that economists have adopted tended to measure technology and technical change in terms of their impact on "productivity". The lack of measurable correlation (at least in the short run) between productivity change and technology development made it difficult to properly assess the impact of technology on economic development, growth and competitiveness. The notion of national competitiveness has been called a "dangerous obsession" by Paul Krugman (Krugman, 1994). He argues that it is sufficient to reject the case for policies favouring high-tech industries on the ground that they are not necessarily high-productivity industries. This is another case of equating technology with productivity and ignoring the "external" effects of technology on the productivity of "user" industries. Technology creation, adaptation and innovation are important, but technology diffusion and use may be even more important for developing countries. New technologies such as information and communications technologies and biotechnologies are cross-section technologies and their application to traditional agricultural, manufacturing and service activities can revolutionize both processes and business methods, increasing both productivity and competitiveness, (Barnes, D. F. 2012).

### **Economic Growth**

Awange, J. L. (2006) studied the use of several methods to track economic growth and most well-known and frequently tracked is the gross domestic product (GDP) in Asia. Over time, however, some economists have highlighted limitations and biases in the GDP calculation. Organizations such as the Bureau of Labor Statistics (BLS) and the Organization for Economic Co-operation and Development (OECD) also keep relative productivity metrics to gauge economic potential. Some suggest measuring economic growth through increases in the standard of living, although this can be tricky to quantify. Gross national product, those of a certain age may remember learning about the gross national product (GNP) as an economic indicator. Economists use GNP mainly to learn about the total income of a country's residents within a given period and how the residents use their income. GNP measures the total income accruing to the population over a specified amount of time. Unlike gross domestic product, it does not take into account income accruing to non-residents within that country's territory; like GDP, it is only a measure of productivity, and it is not intended to be used as a measure of the welfare or happiness of a country, (Layder D. 2005).

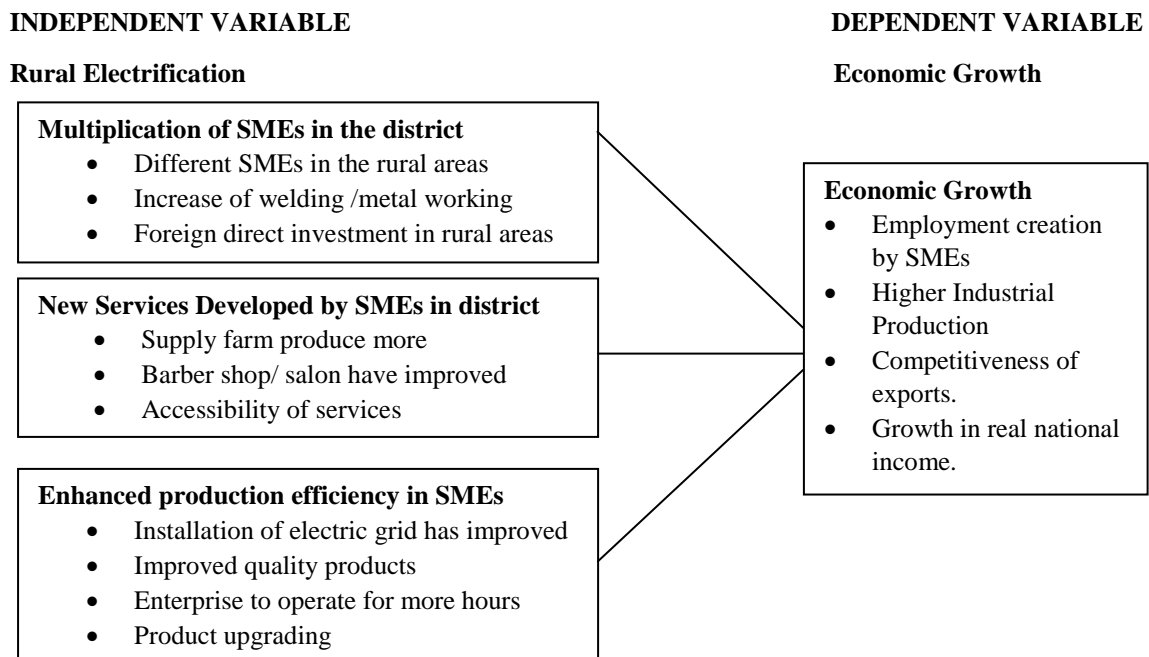
According to Nachmias D. (1996) states that there is little difference between GDP and GNP for the US, but the two measures can differ significantly for some economies. For example, an economy that contained a high proportion of foreign-owned factories would have a higher GDP than GNP. The income of the factories would be included in GDP as it is produced within domestic borders. However, it would not be included in GNP since it accrues to non-residents. Comparing GDP and GNP is a useful way of comparing income produced in the country and income flowing to its residents. The relationship between production and spending is a quintessential chicken-and-egg debate in economics. Most economists agree that total spending, adjusted for inflation, is a byproduct of productive output. They disagree, however, if increased spending is an indication of growth.

Rwanda pursued the Vision 2020 objectives through the successful implementation of medium-term successive strategies. Rwanda started implementing its fourth medium-term strategy, the National Strategy for Transformation through rural electrification is conceived as the bridge between the finalization of the Vision 2020 and the beginning of the Vision 2050, Rwanda’s roadmap towards becoming a high-income country. The results recorded since 2000, in terms of social and economic recovery and development have been impressive. Similar achievements were scored in terms of human development has improve due to rural electrification. Energising Development has therefore started an initiative to evaluate energy access projects in a way that is strongly impact oriented in the districts of Rwanda by attracting investors hence employment opportunities for citezens in the country. This impacts are measured through an assessment of economic benefits, thereby including conceivable impacts on the individual household level as well as benefits for the national economy in Rwanda especially in Busegera District, (Barnes, D. F. 2012).

Concerning electrical appliances, radios and mobile phones are quite common in both project and control villages. Despite the lack of electricity and lower network coverage, already 20 percent own a mobile phone in the non-electrified project villages. Yet, electrification goes along with much higher rates of mobile phone possession in villages in the district of Bugesera especially.

**Conceptual Framework**

From the above conceptual framework, it was clear that rural electrification as an Independent variable (as measured by the multiplication of SMEs, new services by SMEs and enhanced production efficiency in SMEs) affects economic growth as dependent variable (as measured by employment creation by SMEs and competitiveness; sustainability of SMEs). However, there also moderating factors like policies established by the government, (Whittington,2001).



Source: Researcher, (2021)

**FIGURE 2.1: CONCEPTUAL FRAMEWORK**



### 3. RESEARCH METHODOLOGY

#### Research Design

This research problem was used a descriptive research design. According to Cooper and Schindler (2003) a descriptive study was concerned with finding out the what, where and how of a phenomenon. The study therefore enabled the generalizing of the findings from all SMEs and the effect it had on their growth. The main focus of this study was quantitative in nature. However, some qualitative approach was used in order to gain a better understanding and possibly enable a better and more insightful interpretation of the results from the quantitative study.

Additionally, the qualitative approach involved a case study design. The case study design was preferred because according to Amin (2005), case study designs enable the researcher to conduct in-depth and detailed contextual analysis on a limited number of events or conditions and their relationships.

#### Target Population

According to Fraenkel and Warren (2002), population referred to the complete set of individuals (subjects or events) having common characteristics in which the researcher was interested. The study focused on rural electrification particularly the SMEs in Nyamata sector, Gashora sector and Ruhuha sector; these sectors were selected due to their accessibility of the researcher. The three sectors have 336 small and medium enterprises (District executive committee meeting, 2020), comprised of 224 SMEs in Nyamata sector, 70 SMEs in Gashora sector and 42 SMEs in Ruhuha sector.

#### Sample Size

In this study, the population was entailed a survey of all small and medium enterprises operated within three sectors in Bugesera district. According to district sector enterprise database 2019. The researcher did a survey on all the 183 SMEs in the three sectors. The researcher therefore used purposive sampling techniques in selecting interviewees with an option of replacing those who won't respond to the researcher's plea. Purposive sampling was where the researcher consciously decides who to include in the sample. It was used simply because the study targeted basically custodians of the rural electrification. It will also ensure that only SMEs with relevant information will be sampled.

### 4. CONCLUSIONS AND RECOMMENDATIONS OF THE STUDY

#### Summary of Findings

The research was meant to establish the effect of rural electrification on economic growth in Bugesera district in Rwanda. The rural electrification considered included multiplication of SMEs in Bugesera district, new services by SMEs and Enhanced production efficiency in SMEs Bugesera district. A total of 183 questionnaires were issued, 137 were filled and returned, giving 74.86% response rate. The response rate found was adequate for analysis and discussions of the study.

The 25.14% unreturned questionnaires could be explained as resulting from delays of the respondents in filling the questionnaires hence not able to return on the collection date. 65% of the respondents were females and 35% were males. The results indicate the SMEs in Bugesera district is dominated by the females who account for the majority of the respondents. The study results compared well and consistent with the study by Akinyele et al (2016) in which 60% of the respondents were of the female gender confirming that the banking industry was still female dominated. This however, may not affect the study. 53% of the respondents were having undergraduate certification, 29% of the respondents were having diploma certification, while 15% had masters. However, 3% of the respondents had PhD qualification. This showed that the respondents were capable and reliable to explore the underpinning issues related to the study. 48% of the respondents had an experience level of 4-6. However, 34% had 1-3 years' experience. The remaining 14% of the respondents had experience level of 7-9 years and 4% with 10 years and above experience. This implies that most of the people in SMEs in Bugesera district are experienced. Regression analysis was conducted to investigate the statistical significant effect of rural electrification on economic growth in Bugesera district in Rwanda.

#### Discussion of the Findings

*The First Research Objective* sought to determine the effect of multiplication of SMEs on economic growth in Rwanda. The study findings showed that multiplication of SMEs had a statistically significant effect on the economic growth in Rwanda with multiplication of SMEs correlation coefficient of  $\beta = 0.947$  for employment creation and for high industrial production. The strong positive correlations compared well with the findings of Barnes, D. F. (2012), who established that multiplication of SMEs in terms of development of different SMEs in rural areas, increase of wedding/ metal working in

rural areas and foreign direct investment in rural areas. This would eventually enhance the economic growth as is brought out by this study.

**The Second Research Objective** sought to determine the effect of new services by SMEs on economic growth in Rwanda. The study findings indicated that new services by SMEs had a statistically significant effect on economic growth in Rwanda with a new service by SMEs in Bugesera district correlation coefficient of  $\beta = .890$  for employment creation, this implies that increase of new services by SMEs leads to unemployment and high industrial production, this implies that increase of new services by SMEs leads to high industrial production. The statistically significant positive correlations also compared well with the findings of Cook, P. (2012), who established that new services by SMEs in districts of Kenya and London such as supply farm produce more, salon have improved quality services and accessibility of services.

**The Third Research Objective** sought to determine the effect of enhanced production efficiency in SMEs Bugesera district on economic growth in Rwanda. The study findings showed that enhanced production efficiency in SMEs Bugesera district had a statistically significant effect on economic growth in Rwanda with enhanced production efficiency in SMEs correlation coefficient of  $\beta = 0.942$  for economic growth in terms of employment creation and high industrial production, this implies that there was high positive correlation that indicates increase of enhanced production efficiency in SMEs leads to high employment and industrial production in the district. The strong statistically significant positive correlations also compare well with the findings by Mbatia, J. K. (2005) that enhanced production efficiency in SMEs in Kenya analyzed the major initiatives, and installation of grid has prompted, enterprises to operate for more hours and product upgrading hence these results into of employment creation as well as high industrial production.

### Conclusions of the Study

The entrepreneurship in rural areas is a key economic pillar for economic development as much as Rwanda Vision 2020 is concerned. A healthy nation would provide a vibrant working population and so its employment creation and high industrial production are key performance concerns. Considering this, the study sought to establish the effect of rural electrification on the economic growth of districts in Rwanda. The study thus concludes that putting proper rural electrification control and management in terms of multiplication of SMEs, new services by SMEs and enhanced production efficiency in SMEs district respectively would increase economic growth in terms of employment creation as well as in terms of high industrial production in Rwanda.

### Recommendations of the Study

The researcher suggested the following recommendations; Government should ensure availability of electricity in rural areas that would result in efficiency and effective services of the small business in the district. Government should educate people in rural areas to use rural electricity power supply hence increased production by use of machinery. Government should put more emphasis higher industrial production resulting from increased supply of rural electrification power. Government should also train employees on how to connect electricity supply and maintained at all levels on how to utilize effectively the electricity and improve on economic growth in the district.

### Suggestions for Further Studies

Researcher suggested that the next study should analyzed the effect of rural electrification on economic growth of all rural areas in Rwanda. The study should be done across many districts in order to come up with comparative analysis conclusive findings. Researcher further recommends that study should be conducted on urbarn electrification and operational activities in urban areas.

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