

## Rural Electrification and socio-economic development in Bakassi Local Government Area, Nigeria

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### Abstract

*This study examined the relationship between rural electrification and socio-economic development in Bakassi Local Government Area of Cross River State, Nigeria. Following a cross-sectional survey research design, a sample of 420 was drawn from rural dwellers in Bakassi LGA, Cross River State. Multistage sampling technique was used to reach the respondents, who completed the structured questionnaire. The study is founded on the predictions of Basic Needs Approach (BNA). In testing the hypotheses, Chi-square result showed that, there is a statistical relationship between electricity supply and socio-economic development in Bakassi LGA, Cross River State, Nigeria. The study recommended that the government at all levels in collaboration with relevant stakeholders should ensure that basic electricity provisions are made to meet the needs and aspirations of the rural poor as this will create room for sustenance of the well-being of rural dwellers.*

**Keywords:** electricity supply, socio-economic, sustainable development, school, rising, empowerment opportunities, well-being, Nigeria

### Introduction

Rural electrification is the act of providing electricity to rural dwellers with low demand and highly dispersed potential consumers. In today's globalised world, access to affordable, reliable, sustainable electricity supply is now widely recognised by scholars, policy makers, development experts and government as a prerequisite to socio-economic development of the human society (Okon, 2018). This explains why generating sets are common in public places and households: despite the fact that this practice is financially costly; environmentally risky and socially unsustainable (Omang, Okpa, Okoi, & Iniama, 2020; Okpa, Ajah, & Igbe, 2021). From the broader perspective, electricity supply is considered a fundamental driver for the development of economic opportunities and improvement in households' productivity in both agricultural and non-agricultural sector (Barnes & Toman, 2004; Okpa, Ilupeju, & Eshiotse, 2020). In the agricultural sector, it would power farm machinery such as water pumps, fodder choppers, threshers, grinders, and dryers. Electricity would contribute to the modernization of agriculture by extending cultivable land through irrigation. This would lead to increases in labour demand and in productivity (Cabraal et al., 2005; Ukwaiyi, & Okpa, 2017). In the non-agricultural sector, electricity could contribute to the development of small business opportunities, for example, in the food processing value chain, in handicraft production, carpentry and retailing.

Since rural access to electricity supply is very abysmal in Nigeria, increased electricity supply to the rural population is widely acknowledged to guarantee socio-economic development and also in achieving poverty reduction targets in rural communities (Dinkelman, 2010; Ebingha, Eni, & Okpa, 2019). It seems logical to state that electricity is required for effective delivery of basic services such as potable water, health care, telecommunication and education, economic productivity as well as agro-industrial processes in rural areas (Uzoma & Amadi, 2019; Peter, Okpa, & Okoi, 2020). These amenities contribute in no mean way positively to poverty reduction and quality of life of any community. Khandker's (Khandker et al. 2013) study of Vietnam's

rural electrification program exemplifies how a “virtuous circle of development” emerged as significant investments in other rural infrastructure services were undertaken (viz. water supply, roads, health and education) and rural electrification contributed to greater educational attainment, more business opportunities, and higher income, which in turn improved the affordability of electricity and appliances, leading to an increase of total electricity load and more investments in rural electrification. Khandker, as well as others (Kanagawa and Nakata 2008), suggest that electrification, if supported by enabling complementary actions, can lead to positive feedbacks on future electricity demand in a rural context.

The absence of electricity in rural areas imposes significant constraints on modern economic activities, provision of public services, and quality of life, as well as on adoption of new technologies in various sectors such as education, agriculture, and finance (Okoi, Ogar, Ubi, Ubi & Okpa, 2022; Ofem, Okpa, & Joshua, 2021). The provision of electricity in rural areas is widely believed to be a stimulus to increased agricultural productivity and output through irrigation and mechanization, to the growth of rural industries, and to raising the living standards of rural people (McMenemy C, et al, 2010; Okpa, Eshiotse, Ofem, Sylvester, & Andrew, 2021; Ushie & Okpa, 2021). Electricity can be supplied to such areas through small-scale auto generation, local independent grids, or a central regional or national grid (Uzoma, 2010; Eshiotse, Okpa, & Iji, 2021). The conversion of the nexus between electricity usage and development has been limited to urban centres. Relatively, very little detailed research has been undertaken on the specific benefits of electricity services for socio-economic development in rural areas in Nigeria. In order to bridge this knowledge gap, this study is focused on the relationship between rural electrification and the socio-economic development of Bakassi Local Government Area, Cross River State, Nigeria.

## **Theoretical framework**

### **Basic needs approach (BNA)**

The Basic Needs Approach (BNA), also known as the consumption-oriented theory of social development, was originally introduced by the International Labour Organization's World Employment Conference in 1976. In 1977, the idea of meeting basic needs as the goal of development policy was formally introduced for the first time in a report on *employment, growth and basic needs* by the ILO. The basic needs approach assumes that the provision of basic needs to members of the society, usually the poor, was the best and most feasible approach to ending or eradicating poverty in the society. The BNA promoted the construction of selective policies to target the basic needs of the whole population directly, rather than focusing on an indirect approach to satisfying the basic human needs (Streeten, 1982). Antai (2005), Ukwai, Okpa, and Dike, (2018) affirmed that the theoretical relevance of the basic needs approach is founded on the premise that it focuses on the ends of development. This meant a direct attack on poverty through meeting the basic human requirements of the neediest segment of the society, the poor. The basic need approach is relevant to this study as it explains the need for government, non-governmental organization, private bodies, etc to provide the basic infrastructures such as housing, health facilities, access roads, educational facilities, etc needed for sustainability and development of the socio-economic well-being of the rural dwellers in Umuahia North local government area. It illuminates the needs of the people to the government and helps in reforming existing policies on social and economic development.

## **Methods**

Bakassi is located in the Southern Senatorial District of Cross River State and is one of the eighteen (18) Local Government Area of Cross River State with headquarter at Ikot Effiom, Bakassi. It consists of a number of low-lying, largely mangrove covered islands covering an area of around 665 km<sup>2</sup> (257 sq mi). The entire area is underlain by one major geological formation

i.e. the sedimentary basin also bounded by volcanic intrusions of the Cameroon. Bakassi LGA is located between latitudes  $4^{\circ} 43'$  and  $4^{\circ} 55'$  north of the equator and  $8^{\circ} 26'$  E and  $8^{\circ} 38'$  east of the Greenwich meridian. The local government area is bounded in the East by the Republic of Cameroon, in the South by Equatorial Guinea and the Bight of Bonny, in the West by the Cross River Estuary and North by Akpabuyo Local Government Area. Being a riverine and fishing settlement, Bakassi LGA is constantly faced with the perennial problem of fire disaster and marine erosion. Marine erosion, floods, oil spills/pollution, loss of diversity, poor quality of domestic water and frequent occurrence of fire disaster in the congested residential areas of Bakassi are serious environmental problems plaguing the area. Often, oil spills, ocean surge, tidal flows in Bakassi Local Government Area have led to impoverishment of the people. The study area is the lifeline of Cross River State in terms of Crude Oil and aquatic food such as crayfish, fishes, shrimps, periwinkles in commercial and exportable quantities. Virtually all parts of Bakassi lie within the coastlines.

The study area is internationally recognised as one of Nigeria's richest gulf with ten Council Wards, namely; Abana, Akpa Nkaga, Akwa, Ambai Ekpa, Amoto, Archibong, Atia, Ema, Efut/Inwang, Ekpot Abia, and Odiong. Forest reserves include timber and wood, palm produce. The composition of the people is predominantly the Efiks and the Effiats who stay and do business together. The LGA is home to a number of ethnic divisions which include the Efik, the Effiat, and the Oron. The Efik and Oron languages are among the commonly spoken in the area with Christianity and traditional religion are the widely practiced religions in the area. Survey design method was adopted for the collection of four hundred and forty-four (440) respondents from four wards in the study area. This therefore corresponds to methods needed for the collection of data which is extracted from the target population through the IDI and a well-structured questionnaire. The inclusion criteria for this study included; adult males and females between 18-70 years, who have resided in Bakassi Local Government Area for at least three years and express willingness to participate in the study. Data for this study was collected from both primary and secondary sources. A pilot survey was carried to test for the validity of the instrument. The test for reliability yielded Alpha Cronbach coefficients that ranged from .916 to .923 for all the variables. The data collected were extracted, tabulated and subjected to Chi-square statistical analysis using Statistical Package for Social Science (SPSS) version 20 was used for data analysis. Qualitative data was manually transcribed verbatim based on the responses of the respondents and results were summarized into sections or themes.

## Results

The socio-demographic data revealed that 234 (55.7%) were males, while 186 (44.3%) were females. Responses with respect to age showed that, 131 (31.2%) were 28-37 years, 120 (28.6%) were 38-47 years, while 75 (17.8%) were aged between 48-57 years. Respondents' marital status showed that, 245 (58.3%) were single, while 151 (36.0%) were married. With regards to religion, 396 (94.3%) were Christians, 2 (0.5%) were Islam and 22 (5.2%) traditional religion. For educational status, 120 (28.6%) respondents had primary education. 166 (39.5%) had secondary education and 48 (11.4%) had tertiary education. In terms of occupational status, 101 (24.0%) were farmers, 148 (35.2%) were traders/businessmen or women, 54 (12.8%) were civil servant and 78 (18.6%) were unemployed. With regards to monthly income, 201 (47.8%) earned less than N20, 000, 152 (36.2%) earned between N20,000-N50,000 and 67 (16.0%) earned from N51,000 and above.

### Electricity infrastructure and socio-economic wellbeing

Data in table 1 demonstrated that 261 (62.1%) respondents acknowledged that there is existing electricity infrastructure in their communities, while 159 (37.9%) respondents indicated that such provision do not exist in their communities. The main source of electricity as indicated by 234 (55.7%) respondents is PHCN, whereas 186 (44.3%) indicated that they have no electricity

supply in their communities, with regards to the nature of the electricity infrastructure in communities. Again, 160 (61.3%) respondents indicated that the electricity infrastructure was completed, 72 (27.6%) indicated that electricity infrastructure was abandoned and 29 (11.1%) respondents indicated that the electricity infrastructure was ongoing. With regards to the type of organization or partners involved in executing electricity projects, 261 (100%) indicated that all electricity infrastructures were provided by the government. Out of 420 respondents, 253 (60.2%) admitted that provision of electricity infrastructure has improved the socio-economic well-being of the people while 167 (39.8%) indicated otherwise.

TABLE 1: Electricity infrastructure and socio-economic wellbeing

Variables	Number of respondents	Percentage
Current source of electricity		
Solar energy	0	0.0
PHCN	234	55.7
No electricity	186	44.3
Total	420	100
Existence of electricity infrastructure provision in communities		
Exist	261	62.1
Do not exist	159	37.9
Total	420	100
Nature of the electricity infrastructure provision in communities		
Completed	160	61.3
Abandoned	72	27.6
On-going	29	11.1
Total	261	100
Type of organization or partners involved in executing electricity infrastructure provision		
Government	261	100
Benefitting community	0	0.0
Non-governmental organization	0	0.0
Total	261	100
Provision of electricity infrastructure has improved the socioeconomic wellbeing of the people		
Has improved	253	60.2
Has not improved	167	39.8
Total	420	100

Source: Fieldwork

In Table 2, the impact of electricity infrastructure on socio-economic well-being as indicated by respondents showed that majority of the research participants 243 (96.0%) stated that it enhances the processing of agricultural products, 240 (94.9%) improved security, 222 (87.8%) expand employment opportunities, 218 (86.2%) effective and efficient delivery of health care services, 210 (83.0%) proliferation of home businesses, 204 (80.6%) increase household income generation, 172 (68.0%) improvement in maternal and child health outcome, 162 (64.0%) Increase in infrastructural development (e.g. schools, health centers, etc), 150 (59.3%) increase time/hours spent in studying for school children and 140 (55.3%) improve access to water supply.

TABLE 2: Electricity infrastructure on socio-economic wellbeing of respondents

Variables	Yes (%)	No (%)	Total (%)
Enhance the processing of agricultural products	243(96.0)	10(4.0)	253(100)
Improve access to water supply	140(55.3)	113(44.7)	253(100)
Increase in infrastructural development (e.g. schools, health centers, etc.)	162(64.0)	91(36.0)	253(100)
Expand employment opportunities	222(87.8)	31(12.2)	253(100)
Effective and efficient delivery of health care services	218(86.2)	35(13.8)	253(100)
Increase household income generation	204(80.6)	49(19.4)	253(100)
Improvement in maternal and child health outcome	172(68.0)	81(32.0)	253(100)
Increase time/hours spent in studying for school children	150(59.30)	103(40.7)	253(100)
Improved security	240(94.9)	13(5.1)	253(100)
Proliferation of home businesses	210(83.0)	43(17.0)	253(100)

Source: Fieldwork

Responses from the IDI participants across the eight communities affirmed that electricity supply was very poor generally and some communities have no electricity at all. Only a few participants stated that they have been having constant power supply at least 14 hours on daily basis. Most electricity supply are initiated and provided by the government. However, participants who confirmed constant power supply reported positive impact on their socio-economic well-being in terms of increasing income generation for businesses such as selling of cold water and drinks, expand local ventures, boost security, enhance agricultural productivity and enhance delivery of health services. A 40 years old male participant highlighted that:

*NEPA light in this community is very poor. Imagine throughout this week, we had light just once or twice. In some areas, there was no light at all.*

Another participant responded thus:

*We do not have light at home and is so at the health center. We usually use generator when we have emergency to work at the health center.*

Contrarily, a female participant also stated that:

*Like in my place we have steady light for 2-3 months now. They will take it for few hours and bring it back. NEPA is trying in my place, at least those of us who use light for our business are happy.*

### Test of research hypothesis

Electricity supply has no significant association with socio-economic well-being. The independent variable in this hypothesis is electricity supply while the dependent variable is socio-economic well-being. The results presented in Table 3 showed that since Chi-square p-value is less than 0.05, the null hypothesis was rejected. This implies that electricity supply is significantly associated with socio-economic well-being.

TABLE 3: Test of association between electricity infrastructure and socio-economic well-being of respondents

Variables	Electricity infrastructure and socio-economic well-being			$\chi^2$	p-value
	Yes	No	Total		
Existence of electricity infrastructure in communities				389.59	0.016*
Exist	253(96.9)	8(3.1)	261(100)		
Do not exist	0(0.0)	159(100)	159(100)		
Total	253(60.2)	167(39.8)	420(100)		

\*P<0.05

Source: Fieldwork

## Discussion of findings

The result of this hypothesis revealed that there was a significant association between electricity supply and socio-economic wellbeing. This finding is congruent with the work of Kembo (2013) and Pokhare (2007) who identified electricity supply as a critical component to socio-economic development. Out of 420 respondents, 253 (60.2%) respondents affirmed that electricity infrastructure has improved their socio-economic well-being in terms of increasing agricultural productivity, improving household security, expanding employment opportunities, enhance effective and efficient delivery of health care services, proliferation of home business and increasing household income.

Other sectors of the economy completely rely on constant power supply to increase their productivity and display expected performance and output. Because of the importance of electricity supply and the epileptic power supply, individuals and corporate bodies now own generator, inverter, solar power as alternative source of electricity supply to meet up with their day-to-day demand of power supply. However, it became worrisome because some communities in the study area still lack access to power supply which has reasonably hampered their economy growth. This implies that power supply *is* indispensable to improve the living condition of rural dwellers. This is substantiated in a study carried out by Gurung et al (2011) where they found that rural electrification presented a number of significant influences on rural economy in terms of expanding employment opportunities in areas of hair plaiting, tailoring as well as boost agricultural productivity. Therefore, it is pertinent that the government should be involved in improving access to electricity supply in rural areas by providing electricity infrastructure in all localities.

## Conclusion and recommendations

Electricity supply is one of the factors, which may have both a direct and indirect impact on living standards of rural dwellers. Access to efficient electricity supplies enables the provision of basic needs, which are essential indices of socio-economic development by improving agricultural methods, and businesses that are responsible for creating goods and services that sustain society. Substantial resources have been devoted to rural electrification in Nigeria for both economic and social reasons but overall, in most rural areas in the country the extension of electricity access struggles to keep the pace with a fast-growing population that outpaces the efforts in place. The study recommended that the government at all levels in collaboration with relevant stakeholders should ensure that basic electricity provisions are made to meet the needs and aspirations of the rural poor as this will create room for sustenance of the well-being of rural dwellers.

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