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Impact Of Electrification On Eradication Of Extreme Poverty And Hunger: Some Rural Communities Of Delta State, Nigeria Hub Example

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***Abstract*-The general belief that rural electrification enhances sustainable socio-economic development, which by extension, culminates into poverty eradication has been harped on by governments at various levels as well as other stakeholders, and international donors. Based on this strong perception, this study was initiated to evaluate the effects of rural electrification in relation to its ability to eradicate poverty among some relatively newly electrified rural communities in Delta state of Nigeria. 100 households were selected from 3 different rural communities that were electrified almost at the same period using Simple Random Sampling Method. Group discussions were held in order to get diverse perspectives of the stake holders on the subject for balanced deductions by the researcher. The data collected were analyzed with both quantitative and qualitative methods. The study revealed among other things that rural electrification has both positive and negative effects on the rural communities studied; and that rural electrification on its own does not guarantee socio-economic development neither does it have serious significant impact apropos eradication of extreme poverty among the rural poor people studied.**

Keywords—rural electrification, poverty eradication, rural communities, development, millennium development goals

I. INTRODUCTION

The United Nations General Assembly, in the year 2000, adopted some numerical targets that should be met by the year 2015. These targets are referred to as Millennium Development Goals (MDGs) [1]. Prominent among the eight goals is 'Eradication of Extreme Poverty and Hunger'. This is predicated upon the fact that poverty is a known serious impediment to sustainable development all over the world. In consonance with the goals, the United Nations' universal electricity access goal by 2030 was also proclaimed. This involves reaching population with limited incomes, often living in sparsely populated areas, mostly in developing and least developed countries [2]. The underlying assumption of this goal is that electrification contributes to poverty assuagement in many respects. Hence, in order to realize these goals, a number of international bodies like International Monetary Fund, World Bank, World Health Organization are partnering with these goals. [3]noted that while some countries are working hard to meet the objectives, others are not; and yet the issue of poverty is still a concern in those countries.

One of the ways of tackling poverty is to promote opportunity [4]; and one such opportunities is access to electricity [3]. Access to electricity at affordable prices is therefore one of the ways government and multilateral donors promote opportunities. The perceived benefits of rural electrification program can be broadly classified into two: Those which give rise to improved social and environmental conditions and those that results to economic development, hence, by extension, eradication of poverty [5].

Energy access, in particular electricity supply promotes economic and social development and thus, leads to improvements in the quality of life [6]. Lack of access to clean and affordable energy is considered as a core dimension of poverty [7].

The primary objective of this paper is to investigate the extent of poverty and hunger eradication as a result of electrification of some rural communities in Delta State, Nigeria.

It is no doubt that rural electrification has been beneficial to developed societies, hence, some policy planners felt that the same benefits could be achieved in developing societies [8]. [9] noted that questions have been raised recently as to whether the same benefits derived from rural electrification in developed society are duplicable in rural communities in developing countries. Nevertheless, it is important to acknowledge that access to electricity is a right and that electricity is essentially a public service [10]. Therefore economic viability of any area should not be a prerequisite or determinant for electrifying any area be it rural or not.

II. RURAL ELECTRIFICATION APROPOS ITS RAISONS D'ÉTRE

The purpose of rural electrification programs are hinged on a series of ostensible rural developmental benefits. These benefits ranges from social, environmental and economic development. One of the less unequivocally stated objectives of rural electrification programs is for political reasons, by which politicians win the hearts of the electorates in the rural communities. [11] noted that the overall realistic goals for rural electrification is to bring about increased economic development and higher incomes to the people living in the regions to be electrified.

From literature, most frequently stated economic rationales for rural electrification initiative are synopsized as follows:

i. For improvement of the standard of living of the rural poor
ii. Stimulation and encouragement of diversity of agricultural, industrial and commercial development among the rural populace
iii. To supplant more costly energy sources, such as kerosene for lighting and cooking, diesel for individual drives, irrigation pumps and generators.
iv. The above stated summary of the economic objectives are without to social, environmental and political objectives which also provide motivations for the provision of funds to rural electrification programs.

III. STUDY AREA

The study area covers three rural communities in Aniocha South local government area of Delta State in Nigeria. They are namely Ejeme Unor, Ejeme Aniogor and Nsukwa respectively. These communities are located in Delta North senatorial district.

The study takes samples from 30 households from each of two of the three selected villages and 40 households from the largest of them. This makes a total of 100 households which were selected randomly for the study.

IV. METHODOLOGY

The choice of the selected communities which had been electrified 2-3 years back as the pre-qualification era data had to be collected from memory of the community members. If the area that was electrified a longtime ago was picked, then the accuracy of the data to be collected through surveying would be lesser as people tend to forget the history. Again, if the electrification had taken place before a reasonable longer period of less than 2 years for instance, then people would not have been inclined to the effects of electrification. Thus selecting areas with the above criterion and comparing the set up before electrification and after electrification, the differential impact/effect of electrification is thus determined.

V. RESEARCH DESIGN

The design used was non experimental because it was carried out in uncontrolled environment and natural setting. The design looked at the frequency of answers and focused on answers given by all respondents. That is, it is chiefly based on quantitative data. Nevertheless, some qualitative approach was also employed to add to the integrity of the results, provide better understanding and possibly enable a better and more insightful interpretation of the results from the quantitative study.

To identify who were the poor and who were rich, a Proxy Mean Test (PMT) and the occupation of the household head were used during data analysis. A proxy mean test predicts a household's income by collecting simple information about the assets they own [12]. It is basically to identify a set of durables easy to observe, and if you own any of them or any five (5) of them for example, then you are not poor. That is, to identify that if you own a car, a big brick house or a motorcycle, you are not poor. It is the most effective method so far, to the knowledge of this researcher in identifying who is poor and who is rich in a particular setting. Thus, the (PMT) has the lower error rate as compared to other common methods of identifying who is poor. In this research therefore, any household owning a house, a shop or a car and any household with its head employed was considered and categorized as rich.

VI. TARGET UNIT

The main target units in the research or study were the households that were sampled from the communities that was selected. A total of 100 households were selected using a random sampling method. This method gives each item in the population an equal chance of being included in the sample and each one of the possible samples, in case of finite universe, has the same probability of being selected or picked [13].The procedure gives each item an equal probability of being selected. Two (2) focused group discussions were also held in order to get diverse views and also to allow for researcher observation. Discussion with the focused groups are used in order to triangulate the information obtained so that more complete picture of the scenario can be obtained [14].

VII. DATA COLLECTION

Both secondary and primary data were collected in this study. While the secondary data was used in developing and coming up with the literature review as well as the basis for confirmation of the research findings from the primary data sources. The secondary data was collected from published materials. The primary data was collected from the field. The major sources of primary data were the heads of each household picked from the selected area.

VIII. RESEARCH INSTRUMENTS

The major instrument of data collection was the questionnaire. There were two sets of questionnaires; the first set was administered to respondents from the households and the second set was for focused group discussions. The questionnaire included both open and closed type items developed by the researcher.

IX. DATA ANALYSIS

The data collected was analyzed using quantitative and qualitative approaches. Responses to closed questions and open ended questions were analyzed normally to bring out frequencies of responses on the variable that guided the study.

The responses that come from open ended questions were grouped according to similarities. The responses then were captured and analyzed.

X. FINDINGS AND DISCUSSION OF RESULTS

A. Effects of Rural Electrification Programs

On the analysis of the effects of rural electrification program, it was established that whenever an area is electrified or benefits from rural electrification program, both positive and negative effects are experienced in the benefiting area as illustrated in Table 1.

Table1: Distribution of respondents according to what effects they thought rural electrification comes with.

Sample size	Type of Response	Frequency	Percentage (%)
100	Both positive & negative	52	52
	Only negative	2	2
	Only positive	37	37
	I don't know	5	5
Not indicating option		3	3
Total		100	100

The analysis also established that there are more positive (benefits) effects as compared to negative (costs) effects of rural electrification. Table 1 depicts this point. The analysis therefore revealed that there are other negative effects apart from economic and social benefits (positive effects) that are noted by other scholars.

B. Benefit by the Poor to Rural Electrification

It was found that the poor, especially the very poor do not benefit from rural electrification as illustrated in Table 1. This is to say, the rich benefit more from rural electrification than the poor that the program is meant to benefit. This is also supported by Table 2, which shows that, of the sampled respondents, the categories with the highest percentage of "not connected" are those that can be grouped as poor, example are those doing nothing and those doing farming which was found to be dominant in the area as illustrated in Figure 2.

Table 2: Distribution of Respondents According to opinion on Whether the Poor had benefited from Electrification

Sample size	Type of Response	Frequency	Percentage (%)
100	Positive (yes)	94	94
	Negative (no)	6	6
Not indicating option		0	0
Total		100	100

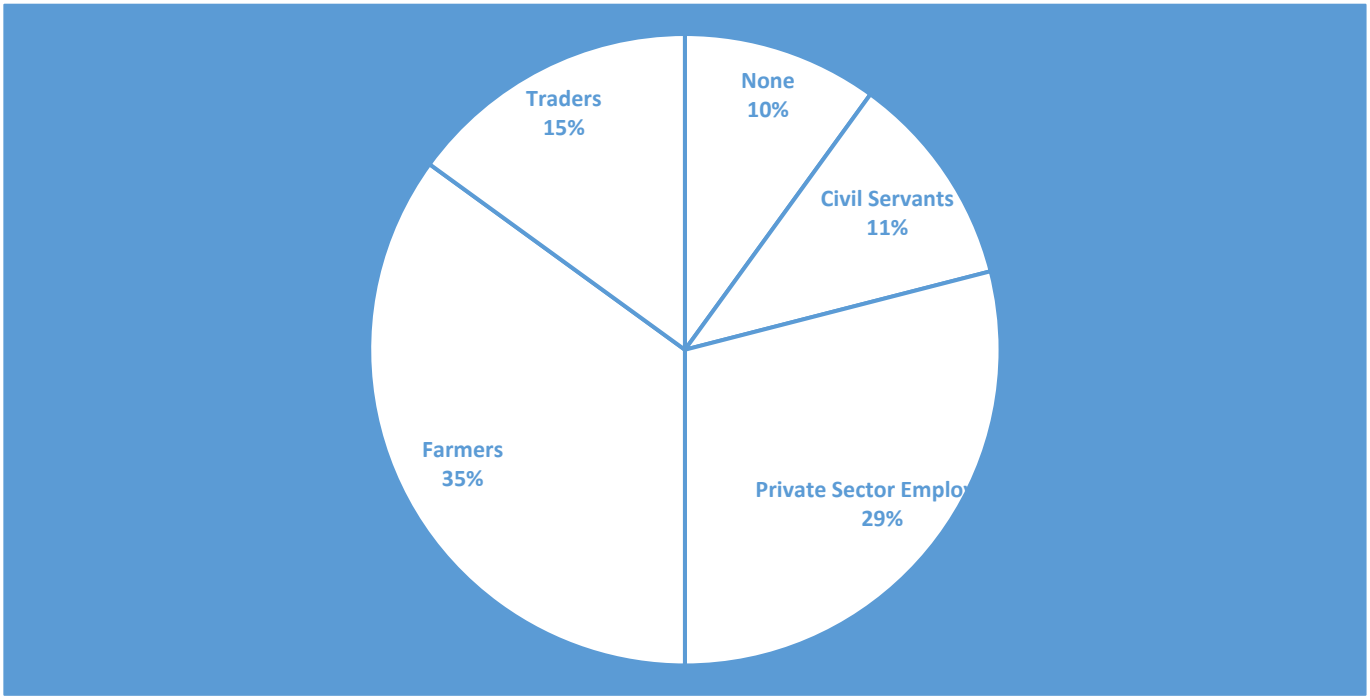

Figure 2: Distribution According to Occupation of Respondents

Table 3: Occupation against Connection to Electricity

Type of Response	Total	Connected	Not connected	Percentage of connected	Percentage of not connected
Civil servant	11	4	7	35	63
Private sector Employee	29	21	8	72	28
Farmers	35	10	25	29	71
Traders	15	5	10	33	67
None	10	1	9	10	90
Total	100	41	59	59	41

This is further supported by Table 3. The table shows that more than half of the households that were categorized as rich (households that owned at least one of the selected items- house, car or shop) were connected indicating that more rich households benefited from the program. This explains why only a few households were connected to electricity and many not connected.

C. Most Significant Changes Brought by Electrification

The analysis also found that the most significant changes brought by rural electrification include new/more good houses, people using electrical appliances, high population, more businesses, lighting in the area, reduced cutting of trees, improved life status, reduced crime, and reduced charcoal sales and high house rentals in the area. It was therefore established that the two major changes are high population in the area and new/more good houses being built in the area.

D. Effect on Poverty Reduction

It was established that rural electrification by itself does not directly lead to sustainable development or economic growth. Firstly, the productive uses are mainly constituted by low-load uses. It was found that the main uses of electricity were concentrated in house purposes. Figure 3 illustrates this scenario. Productive uses of electricity were constituted by uses such as lighting for extension of working hours for shops and bars.

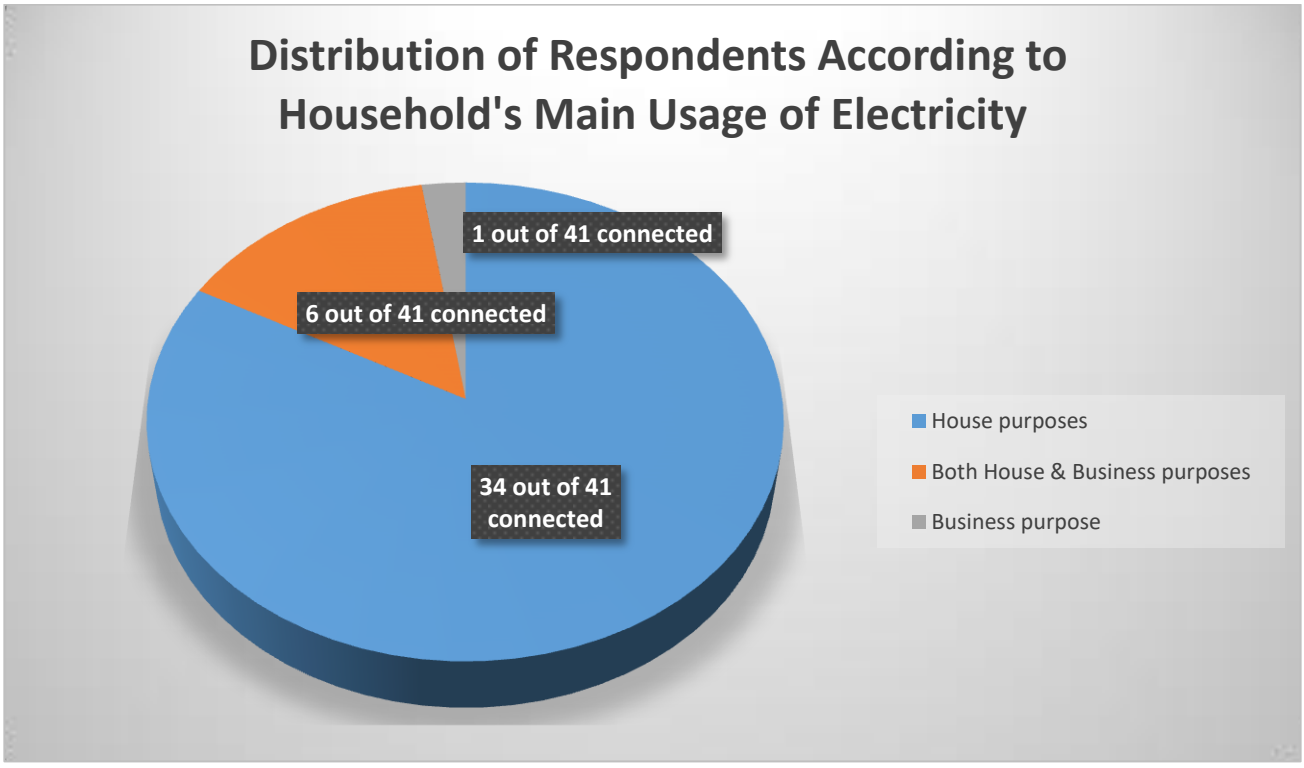

Figure 3: Distribution of respondents According to Household's Main Usage of Electricity

Secondly, it was revealed that most households were not involved in any economic activities enabled by power or electricity. This is confirmed in table 4. It was observed that where there some forms of income generating activities were undertaken such as ice blocks making, popcorn popping, and so on, which in view of the researcher cannot directly lead to sustainable development or economic growth of the communities.

Table 4: Distribution of Respondents According to Household Involvement in Economic Activity Enabled by Electricity

Sample size	Type of Response	Frequency	Percentage (%)
100 (41 connected)	Yes	8	20
	No	33	80
Total		41	100

I was also revealed that rural electrification in the area of research did not contribute positively to income generation of households. This can be confirmed in table 5. It was established that introduction of electricity resulted in loss of income for some individuals that were in the business of selling charcoal, candle, firewood etc. Many other people, especially the poor were faced with the problem of paying for electricity connection charges and other related costs such as wiring, and afterwards had to contend with the issue of paying for consumption charges.

Table 5: Distribution of Respondents According to Electrification's contribution to income Generation of Household.

Sample size	**Type of Response**	**Frequency**	**Percentage (%)**
100	Contributed positively	20	20
	Contributed negatively	44	44
Not indicating option		36	36
		100	100

XI. CONCLUSIONS

Rural electrification is a very important process to provide access to modern energy, especially to the poor people in developing countries like Nigeria. This program is meant to address the disturbing issue of extreme poverty which is prevalent in such rural communities. However, as these initiatives usually do not start with an assessment of the needs of the poor that they were meant to serve, they end up not being responsive to the poor rural people they are meant to benefit. In other words, there are important development benefits that can be gained from rural electrification, but in order to achieve these benefits (rural development and poverty eradication objectives) there needs to be an integrated approach and combined efforts from all stakeholders.

This study further revealed that there are other effects (negative effects) of rural electrification apart from the common economic and social benefits (positive effects) that are already noted by other scholars. Hence, despite the importance of electricity to economic growth and social development as noted in literature review, the electrification of rural communities that have been lacking electricity supply results in some unfavourable effects on the rural people. More notably, introduction of electricity results in loss of income for individuals that are in the business of selling charcoal, candle, firewood etc. and loss of income for households that need to pay for connection charges and other related costs such as wiring and consumption charges.

It was found that the poor, especially the very poor do not benefit from rural electrification. This implies that the rich benefit more from rural electrification than the poor in the studied rural communities of Delta State, Nigeria.

The extent of benefit by the poor was insignificant. The benefit by the poor is mainly/ only ends at being employed general workers (unskilled labour force) during the project implementation phase.

Rural economic development, and by extension, eradication of poverty needs more than just household electrification. Firstly, constraints on the availability of energy and its affordability affect economic development, especially in rural communities. Secondly, other measures including complementary economic development programs alongside the provision of electricity are also very critical in boosting business development, economic growth, and on the long run, eradication of extreme poverty.

Finally, in promoting rural electrification to lead to sustainable development, government at different levels should introduce incentives to encourage production and effective uses that are constituted by low-load uses to enable heavy form of income generating activities in rural areas. In other words, there is need for incentives to encourage rural industrialization and the setting up of industries in rural areas that electricity can enable as electrification on its own cannot eradicate poverty, but its productive use. The inclusion of complementary services for example, advocacy to take-up and use electricity including training is another important element for creating the change in attitude. The services should be made up of sensitization campaigns to raise awareness amongst households, enterprises and social institutions of both the advantages and disadvantages of electricity for example.

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