
THE IMPLICATION OF UNSTABLE ELECTRICITY POWER SUPPLY ON THE SOCIO-ECONOMIC ACTIVITIES IN NIGERIA: A CASE OF KOGI STATE

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Abstract

The study x-rayed the implication of unstable electricity power supply on the socio-economic activities in Nigeria. In an attempt to obtain the results justifying the objectives of the study necessitate the gathering of necessary data from the business operators and households segments of the society. This was done through the adoption of a well structured questionnaire. The data obtained was subjected to statistical analysis using inferential statistics owing to the nature of the data. It was established from the findings that the lack of stable electricity supply in the country with reference to the focus state, Kogi State has created a scenario whereby overhead cost of businesses has been unnecessarily heightened due to extra cost of privately generated alternative energy supply leading to unabated inflation. It has also been established that the households are enmeshed in energy poverty as they often resort to unclean and unsafe alternative domestic fuel such as firewood and wood charcoal which have both health and environmental concern. The study therefore advocates amongst others that the government should provide rural communities with solar or wind energy to boost overall energy supply in the country and that power distribution companies should immediately stop direct electric billing to customers and ensure that provision of electricity meters becomes their prime responsibility in order to improve the efficiency in the power sector.

Keywords: Unstable electricity, power supply, socio-economic activities, Nigeria

Introduction

Energy is a critical factor for economic growth of any nation as energy commodities facilitate economic development by increasing productivity and income as well as creating employment (Rapu, Adenuga, Kanya, Abeng, Golit, Hilili, Uba and Ochu, 2015). Energy underpins all of the social and economic activities in our daily life (Anam, Muhammad, Muhammad and Jiahai, 2020). UNIDO (2008); Akubo and Maduagwu (2021) energy is important in supporting productive activities in both the formal and informal sectors. Energy is central to sustainable development and poverty reduction as it affects all aspects of development which include social, economic, environmental, livelihoods such as access to water, agricultural productivity, health population levels, education and gender issues (Oyedepo, 2012).

The unstable, poor, unreliable and cost-effective attributes of Nigeria energy supply particularly the electricity cannot be divorced from the poor low level of investment (both domestic private and foreign direct investments). This can be further linked to unemployment, poverty and other macroeconomic challenges which Nigeria is currently enmeshed. According to Nwakwu and Njogo (2013) it has been observed that the citizens of many poor nations of the world have less access to electricity while the richer countries have more access to electricity and consume far more than the poor countries.

Nigeria has been able to trace the collapse of her industrial sector and small and medium-scale businesses as well economic downturn to the inadequate and erratic state of the country's electricity market (Olugbenga, Jumah and Phillips 2013; Rapu *et al*, 2015).

The majority of Nigerians have resorted to using privately supplied energy sources to generate electricity for both domestic use and business purposes. Without these alternative arrangements the activities of artisans, hoteliers, restaurant businesses, hospitals, bakeries and the entire productive sector of the Nigerian economy would have come to near zero performance due to poor electricity supply from the National grid. The power supply has failed to provide electricity to 40% of Nigerians in the last 10 years and over 80 million of its citizens are without access to electricity (Bamisile, Huang, Dagbasi, Alowolodu and Williams, 2020).

Nigeria has what it takes to generate steady electricity due to the presence of energy resources across the country but hardly has it translated to that. Considering the factors that are cardinal in the ease of doing business, the World Bank (2020) ranked Nigeria 169th with reference to getting electricity among 190 countries.

The global economies are advocating for energy efficiency with emphasis on cleaner energy which favours renewable energy sources but Nigeria's energy supply has continued to negate that global trend whereby diesel or petrol energy supply plants are used by households and businesses for privately supplied energy sources. This has serious implication on environmental pollution and health concern as well as global warming.

Electricity demand in Nigeria is estimated at 24,380 MW as at 2015 (Ley, Gaines, Ghatikar, 2015; Onyekwena, Ishaku and Akanonu, 2017) which is estimated to grow to 45,490 MW in 2020; 115, 674MW in 2030 and 213, 122MW in 2040 but the total available generating capacity is averaged at 7,139.6 MW (Onyekwena *et al*, 2017). The implication here is the huge gap existing between energy supply and demand indicating a deficit in energy product in Nigeria. This leads to energy poverty which manifests through high prices of goods and services due to extra cost of production transmitted through additional cost of privately

generated energy source. On the side of households, kerosene and firewood and its by-products such as sawdust are used for cooking, while hydrocarbon products are used to generate electricity for household use which is known for both noise and air pollution which constitute health hazards. This is an aspect of energy inefficiency which affects human and ecological balance adversely.

According to Oyedepo (2012) energy inefficiency manifests in Nigeria whereby 70 to 80% of households depend on fire wood for cooking in remote villages and towns as well. According to him, the consequences of the practice is the unchecked practices of felling trees which has negative impact on desert encroachment, soil erosion and loss of soil fertility.

The unstable supply of electricity creates uncertainty for business activities and constitutes energy insecurity which constrains business operations. According to Scott *et al* (2014), electricity insecurity can affect several aspects of business operations such as forced and unexpected halt in manufacturing processes including running assembly lines, using machines tools or producing textiles and generally affecting routine operation of businesses and their ability to ensure delivery times. To this end Iwayemi, (2008) maintained that Nigeria's persistent energy crisis has weakened the industrialization process and significantly undermined the efforts to achieve sustained economic growth, increased competitiveness of domestic industries in domestic, regional and global markets and employment generation

Literature Review

Access to affordable and reliable energy and clean cooking facilities is indispensable for social and economic welfare which is integral to eradicating poverty, combating inequality and improving health (United Nations, 2020). According to the report, delivering adequate standards of living across the globe clearly demands for more rapid progress towards the provision of clean reliable and affordable energy for all. Electricity infrastructure in particular has been found to facilitate rising standard of living (Stern, Burke and Bruns, 2019).

Greater access to electricity can create a positive spillover effect by increasing incomes and spur the poor segment to invest in education and poor productive resources that are central to sustainable development (Practical Action Consulting 2015; Momoh, Anuga and Obidi, 2018). As it is spelt in UN Sustainable Development Goal (SDG) 7, for the realisation of SDGs in the year 2030, there should be a universal access to affordable, reliable and modern energy services. Lack of access to modern energy services disproportionately affects women and girls who are often the primary household energy managers (International Energy Renewable Agency, 2021). In developing countries which Nigeria belongs the women spend hours looking for wood for domestic cooking and availability of electricity will save them the time and energy for other productive activities including human capital development. Lack of electricity access represents a fundamental barrier to progress; the consequences are particularly grave for women and girls (IRENA, 2021). At the individual level, increased energy consumption is likely to be one of the major causes of improvement in welfare of other people (Aremu, 2014).

Energy infrastructure constitutes economic overhead capital which influences investment decisions as it goes a long way to facilitating the ease at which economic activities are carried out. Modern industries cannot operate without steady electricity power supply. This study considers that neoclassical growth model will be adapted for the work.

According to use Stern (2010) the neoclassical production function assumes that an infinite number of efficient techniques coexist at any point in time and substitution occurs among

these techniques. The neoclassical growth model of Solow (1956) established that differences in per capita income between countries are principally hinged on differences in technology across countries. It shows that countries with better energy technology which of course confer energy output and cost efficiency tend to grow more through affordability of energy products and utilization.

Electricity power supply need of the countries continue to grow but the rate at which some countries are investing on the energy infrastructure may not be commensurate with the requirement of the populations need in terms of domestic and economic energy supply requirements. According to Marin, Alokshandra and Pawel (2021) electricity is an important driving force for economic growth and social development in countries. Access to stable electricity is key to the smooth operation of almost all economic activities within any given economic unreliable supply of private households but also public institutions such as schools and hospitals (Hanfer, Strasser and Tangliapietra, 2018). High frequencies and durations of power outages tend to increase the cost of living, deteriorate the well-beings of individuals and retard their job performances (Fakih, Ghazalian and Ghazzawi, 2020). Lack of reliable electricity in the Sub-Saharan Africa has resulted in economic losses of about 2% of the region's GDP and about 5% of annual sales of its firms (Castelano, et al, 2015; Avila, et al, 2017). The firms resorted to self-sources of energy supply which automatically increases overhead cost of business firms. This is evidenced in Nigeria whereby firms use a back-up generator costing more than 300% of the electricity from the national grid (Avila, Carvallo, Shaw and Kammen, 2017).

The low level of electricity supply to most Sub-Saharan African countries has led to the unclean and environmentally hazardous alternative energy sources particularly the biomass. According to Hafner, et al (2018), over 50% of the population in Sub-Saharan Africa rely on biomass with five of the countries (Nigeria, Ethiopia, Democratic Republic of Congo, Tanzania and Kenya) bearing the heaviest burden in terms of total biomass consumption.

The use of biomass which grew the level of poverty is not without the associated consequences. According to Marcin, et al (2021), the use of traditional energy mass is associated with loss of manpower arising from time wasted for wood collection by women and children, indoor air pollution, deforestation and soil degradation. The indoor air pollution caused by the inefficient use of solid biomass kills about 600 thousand people every year which is projected to increase with the increasing population (Hafner et al, 2018).

Despite the arable land and high proportion of the population that engage in agriculture in Nigeria, hunger and food prices seem increasing. This may not be far from poor access to electricity power supply for agricultural activities. According to Hafner et al (2018), energy is a key input at all stages of food value chain (production, processing, storage and transportation) and as such, low energy consumption in agriculture translates to low resilience of the sector to vacancies of weather and high vulnerability to climate change.

Theoretical Framework

Neoclassical economic setting is mostly concerned about what determines accelerated economic growth which in turns influences the welfare of the citizens. The neoclassical growth models were credited to Solow (1956), Swan (1956), Cass (1965), Koopmans (1965). The long term growth is determined by accumulation of capital, labour and technical progress (Foughet and Hippe, 2015). It is believed that convergence in electricity consumption between Nigeria and more advanced economies will enable Nigeria to catch-up.

The basic Solow model postulates that the diminishing marginal returns to capital guide the growth process within an economy towards achieving a steady state. According to Jannky (2008), at the steady state where output per capita, capital stock and consumption growth at exogenous rate of technical progress entails that the levels of per capita income and growth rate will be equalized for countries with common preferences and level of technology.

This justifies the facts that the level of electricity infrastructures, supply and consumption will go a long way to affecting the prosperity by which Nigeria can achieve sustainable growth and development. Electricity is cardinal to the 21st Century world economic space for efficient utilization of resources and information and communication technology which drives the economic activities. It is an essential factor to FDI inward into the host economy as countries with stable and reliable electricity supply will be attracted to the foreign investors.

Empirical Literature Review

Empirical reports exist on the inconsistency in energy supply in the form of power outages, intermittent interruption, or load shedding on the socio-economic activities in the affected areas. Akinlo (2008) examined causal relationship between energy consumption and economic growth for eleven countries in Sub-Saharan African countries and found that positive and significant relationship was established between electricity consumption and economic growth in eleven countries of Sub-Saharan Africa. Aleba, Prinslov and Gawlik (2019) employed descriptive and Bivariate statistics to examine relationship between electricity supply and industrial growth in South Africa (Gauteng and North-West Provinces) to establish some findings such as that fluctuation in electricity supply negatively affects employees motivation to work, delay product line deadline, affect telecommunication and profit margins of firms.

Fakih et al (2020) who empirically established consequences of power outages on firms on middle East and North Africa that an increase in power outages more than 10 hours will lead to decrease in annual sales growth by 0.30 percentage points, decrease annual employment rate by 0.10 percentage points and reduction in annual labour productivity rates by 0.14 percentage points.

Yusuf, Olalekan and Wille (2013) investigated the relationship between electricity consumption and real GDP growth in Nigeria between 1970 and 2015 where they established a unidirectional causality from real GDP to electricity consumption without any feedback effect. They came to the conclusion that the electricity consumption within the period was so unintentional which could not cause economic growth.

Adegbemi and Babatunde (2013) employed econometric model to investigate the nexus between energy consumption and economic growth between 1975 and 2010 and established that 1 percent increase in total energy consumption in Nigeria will bring about 28% increase in real GDP. On the overhead, Abner, Izuchukwu, Eneoli and Udo (2021) established bidirectional causality from natural gas and electricity consumption to economic growth and from economic growth to natural gas and electricity consumption between 2000 and 2018. This result implies that a decrease in energy consumption in Nigeria will lead to decrease in the economic growth in Nigeria as well. Positive relationship also established by Umeh, Ochuba and Ugwo (2019) from the empirical findings of the effect of energy consumption on economic growth between 1980 and 2018.

Methodology

A survey design will be adopted in the process of data collection. This is because where all members of target population cannot be reached and a survey design makes it possible to make judgment on the people to be drawn

The population for the study comprised residential owners and business operators that are either connected with national electricity grid or those who power their houses/business outfits across the three senatorial districts of Kogi State. The sample population is 400 business owners and instrument of analysis are adequate and suitable for the study

The questionnaires which constitute the instrument of data collection were used to gather information from respondents. The questionnaire titled ‘socio economic effect of electricity questionnaire. To analyse the statistical properties of the data, inferential statistics was used and the result plotted in bar chart for clarity.

Data Presentation and Discussion

Section A: Business Directed

(i). Business Line

1A. What is the nature of your business?

Table 1A

Options	Responses	Percent (%)
(a) Hotels & Restaurants	60	15%
(b) furniture/welding	85	21.25%
(c) supermarkets/business centres	150	37.5%
(d) filling stations	80	20%
(e) Pharmaceutical clinics	25	6.25%
Total	400	100%

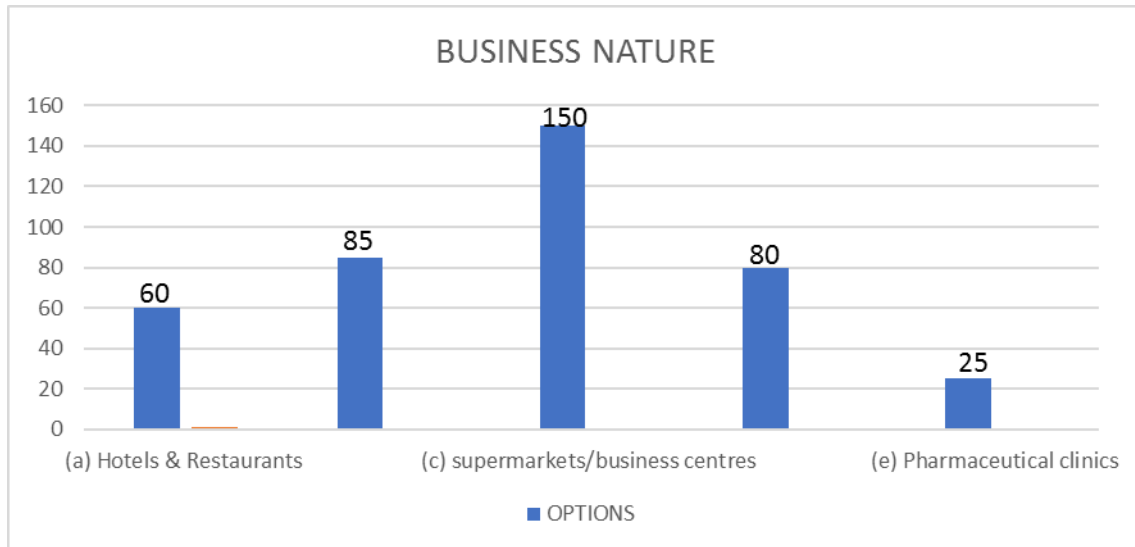


FIG 1A: Business Nature

This section sought to find out how different business activities are affected by unstable electricity power supply in Nigeria. In table 1A, the nature of business engaged by the respondents are outlined with hostels/restaurants having 60 respondent (15%), 85 respondents (21.21%) are into either furniture or welding, 150 respondents representing 35.5% are into supermarket or business centres. 80 respondents (20%) engage in filling station while 25 respondents (6.25%) are into pharmaceuticals/clinics.

ii. Energy Utility Supply

2A. The purchase of our transformer was by

Table 2

Options	Responses	Percent (%)
(a) community efforts	190	47.5%
(b) individual efforts	30	7.5%
(c) government agencies, political office holders	90	22.5%
(d) power holding companies	90	22.5%
Total	400	100%

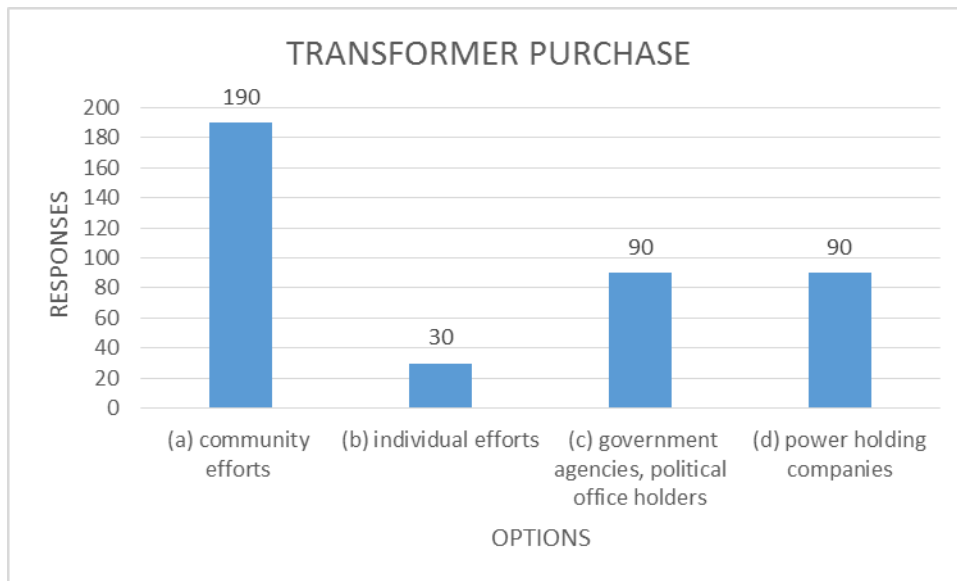


FIG 2A: Purchase of Transformer

From the table 2A above, it shows that the purchase of transformers which constitute basic utility in electricity supply and utilization is mostly by the end users efforts. From the findings, 190 respondents (47.5%) maintained that the transformers used to step down power supply in their business location were purchased through the community efforts, 30 respondents (7.5) believed that it came through individual efforts, 90 respondents (22.5%) asserted that some government agencies/political office holders provided their transformers while another 90 respondents representing 22.5% believe that the power holding company provided their transformers.

3. The metering of your house is by

Table 3A

Options	Responses	Percent (%)
(a) PHCN without charges	60	15%
(b) self-purchase	320	80%
(c) Donor agencies	20	5%
(d) Philanthropist gestures.	NILL	0
Total	400	100%

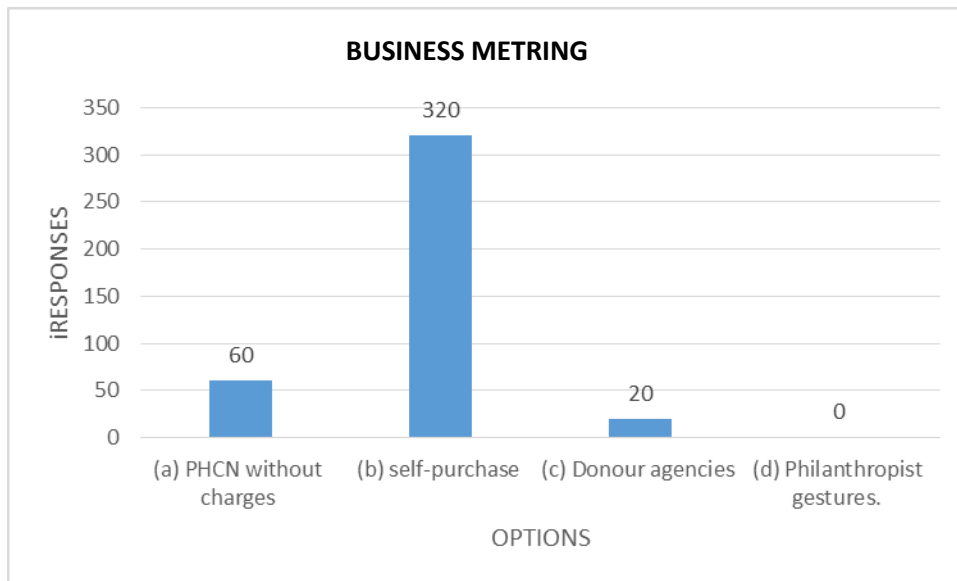


FIG 3A: Housing Metering

The table 3A shows the analysis of the research item which sought to establish how the metering of their business premises were provided. From the analysis, 60 respondents (15%) maintained that electricity meters used in their business shops were provided by PHCN on free of charge, 320 respondents (80%) opined that they purchased the electricity meters and 20 respondents (5%) said that the meters were supplied by donor agencies. In a situation, whereby the people buy the meters themselves, the level of excludability will be high and is creates avenue for the electricity distribution to give arbitrary charges to those on direct pay billing. The major objective of electricity distribution companies is to meet up with the target income from the target areas or zones. This is achieved not without certain segment of the population at the receiving end, whereby they will have to bear the burden of payment which does not commensurate with the quantum of energy consumed.

4A. The power installation to your business outfit such as electricity poles and wiring is mostly through

Table 4A

Options	Responses	Percent (%)
(a) individual	180	45%
(b) government	40	100%
(c) community efforts	160	40%
(d) philanthropist	NILL	0
(e) PHCN	20	5%
Total	400	100%

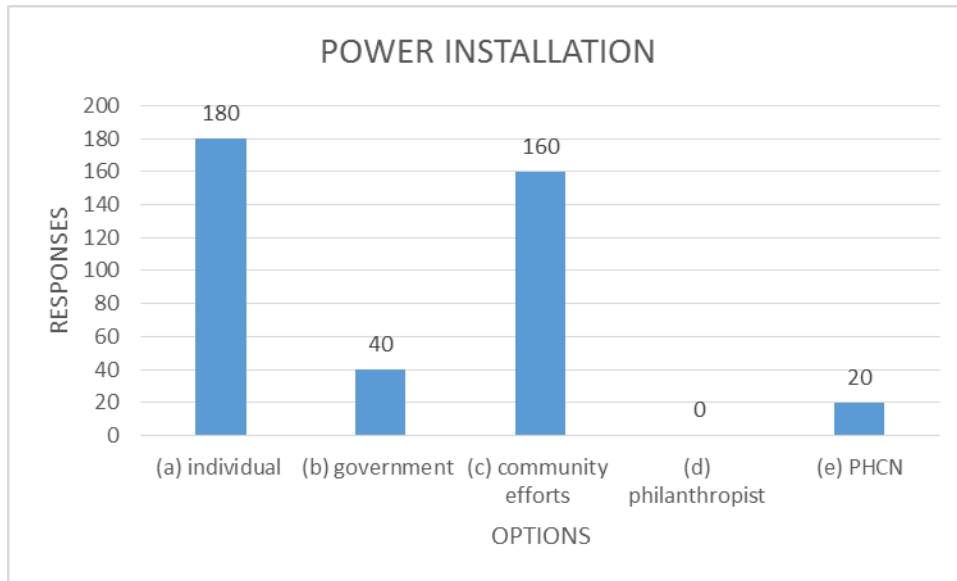


FIG 4A: Power Installation.

From table 4A, the research item is about establishing the power installation to their business areas like electricity poles/wiring. From the analysis, 180 respondents (45%) said it was by the individual, 40 respondents (10%) said it was installed by the government, 160 respondents (40%) it was through the community efforts the government and 20 respondents (5%) believed that is through the PHCN. The energy distribution is not incurring cost of installation but will not give a rebate to the consumers which have installed the energy infrastructures to their houses or business unit.

iii. Energy Use Mix

5A. Energy Sources:

Table 5A

Options	Responses	Percent (%)
(a) Electricity supply from national power grid	160	40%
(b) National power grid and private power supply using generating plant (generator)	220	55%
(c) solar supply by the government	NILL	0
(d) solar supply by self	20	5%
Total	400	100%

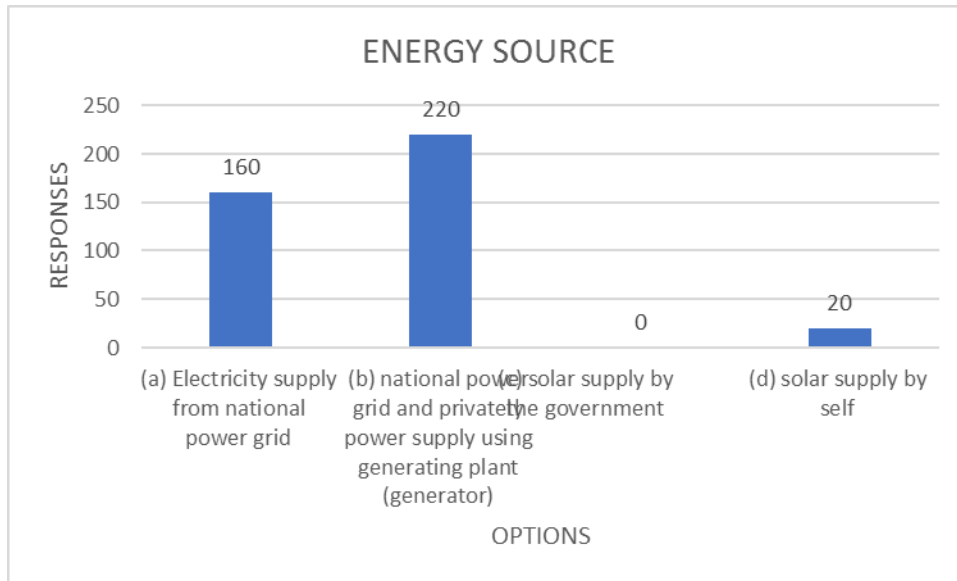


FIG 5A: Energy Source

Table 5A shows energy mix available to the business operators sampled for the study. 160 representing (40%) are powered by the electricity supply from the national power grid, 220 respondents (55%) alternate power generating plant with national power grid while 20 respondents (5%) use solar power system purchased by self but none had government access to publicity provided solar energy. The lack of commitment by the government to provide solar power to small or rural communities affect energy efficiency in the country since the energy supply from the national grid is below the optimal energy consumption need, the electrification of rural communities with other solar energy installation would have served to augment the deficit in energy supply requirement in the country.

6A. Cost impact of electricity on business profit position:

Table 6A

Options	Responses	Percent (%)
(a) 50% - 60%	160	40%
(b) 40% - 50%	80	20%
(c) 30% - 40%	100	25%
(d) 20% - 30%	20	10%
(e) 10% - 20%	40	10%
(f) 1 – 10%	NILL	0
Total	400	100%

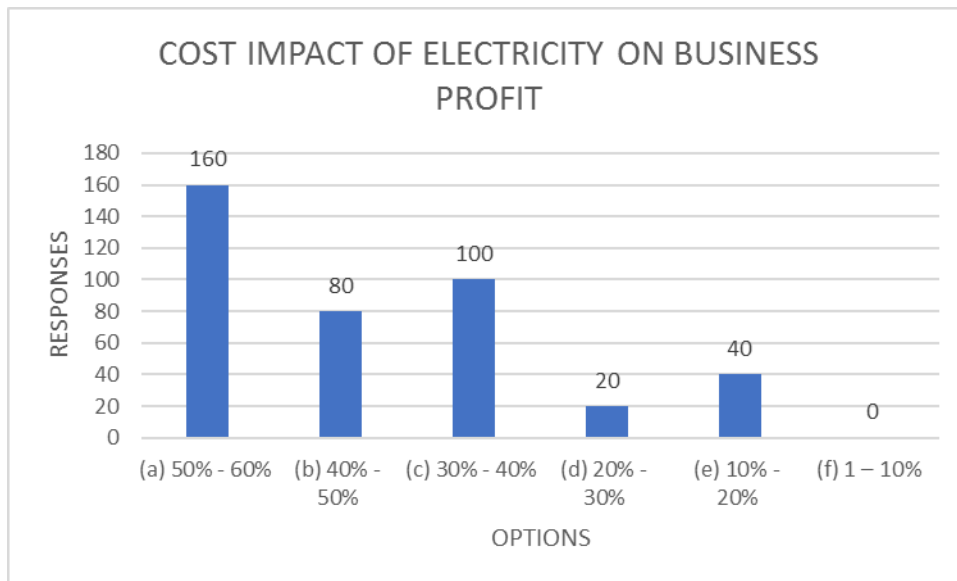


FIG 6A: Cost impact of electricity on business profit

The research question item sought to establish the cost of unsteady electricity supply burden and from the respondent 160 (40%) maintained that the effect has led to 50%-60% reduction of their profit margin, 80 respondents (20%) said that profit margin down by 40%-50% as a result of the problem of unstable energy supply, 100 (25%) believe that their profit margin has been affected to the tune of 30% - 40%, 20 respondents (5%) maintained 20%-30% of their profit margin been eroded by the power failure while 40 respondents (10%) said their profit position has been affected by 10% to 20%. This could explain the underdeveloped nature of most businesses in Nigeria especially the SMEs which is believed to be engine of growth in developing countries like Nigeria.

Discussion of Results

Section B: House Hold Directed

(i) Nature of Settlement

1B. Description of the dwelling

Table 1B

Options	Responses	Percent (%)
(a) rural/farming community	140	35%
(b) sub-urban	240	60%
(c) urban/city	20	5%
Total	400	100%

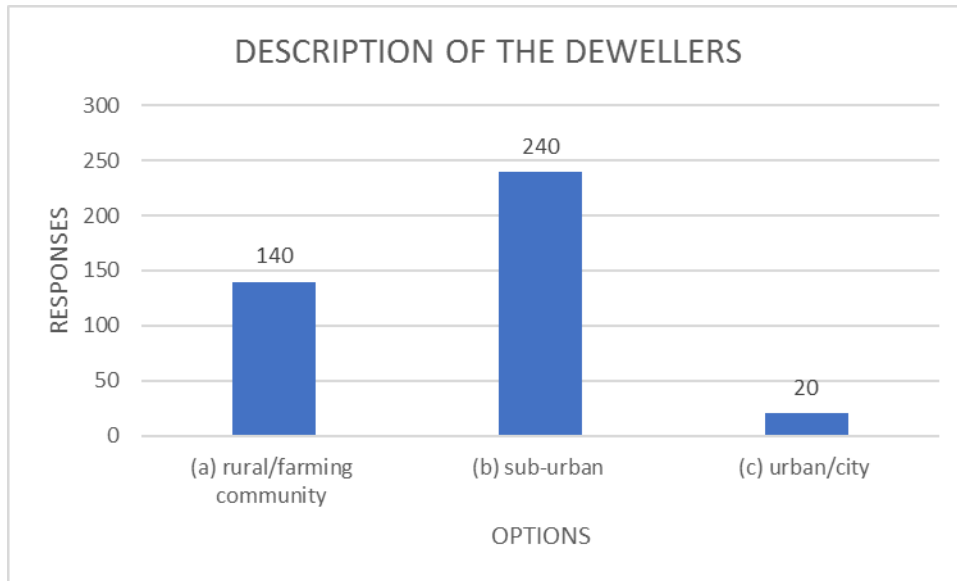


FIG 1B: Description of the Dwellers

The Items in the table 1B is directed to the household section which sought to know the nature of settlement which the respondents live. It shows that 140 respondents (35%) reside in rural/farming communities, 240 respondents (60%) live in sub-urban areas, while 20 respondents (5%) are in the urban/cities

(ii) Utility Supply

2B.The purchase of the transformer was by

Table 2B

Options	Responses	Percent (%)
(a) community efforts	270	67.5%
(b) individual efforts	30	7.5%
(c) government agencies	70	17.5%
(d) political office holders	30	7.5%
(e) power holding companies.	NILL	0
Total	400	100%

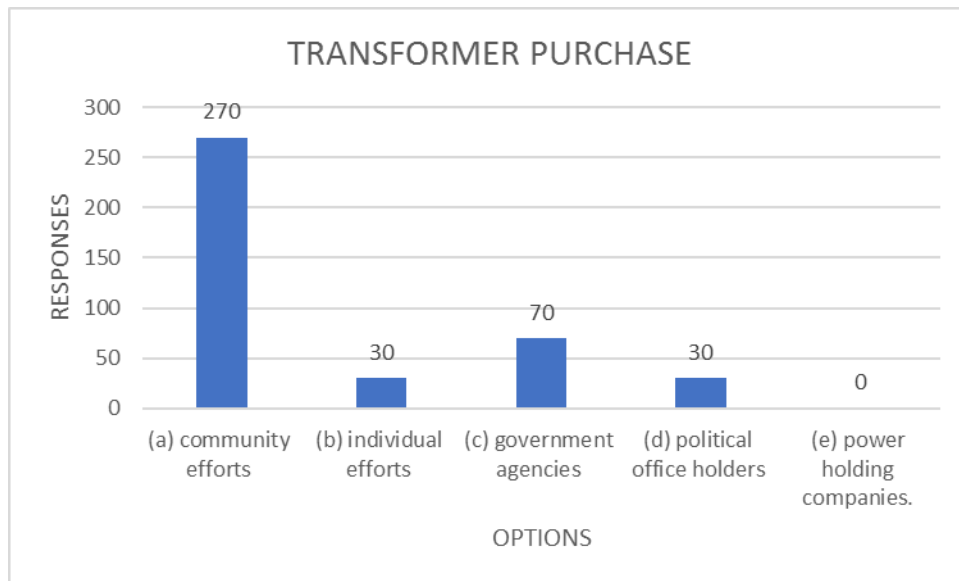


FIG 2B: Transformer Purchase.

The questionnaire item in the table 2B above is directed at establishing channels at which the step down electricity transformers are purchased in their various communities. From the findings, 270 respondents (67.5%) said that they were procured through the community efforts, 30 respondents (7.5%) believed that they were purchased by the individuals, 70 respondents (17.5%) maintained that they were supplied by the government agencies. In addition, 30 respondents (7.5%) claimed that the political office holders provided their communities with the transformers and none of the respondents claimed that the power holding company provided step down transformer for their communities. This explains how ineffective the electricity energy sector in Nigeria seems to be.

3B. The metering of your house is by

Table 3B

Options	Responses	Percent (%)
(a) PHCN without charges	103	25.75%
(b) self-purchase	275	68.75%
(c) Donor agencies	22	5.5%
(d) Philanthropist gestures.	NILL	0
Total	400	100%

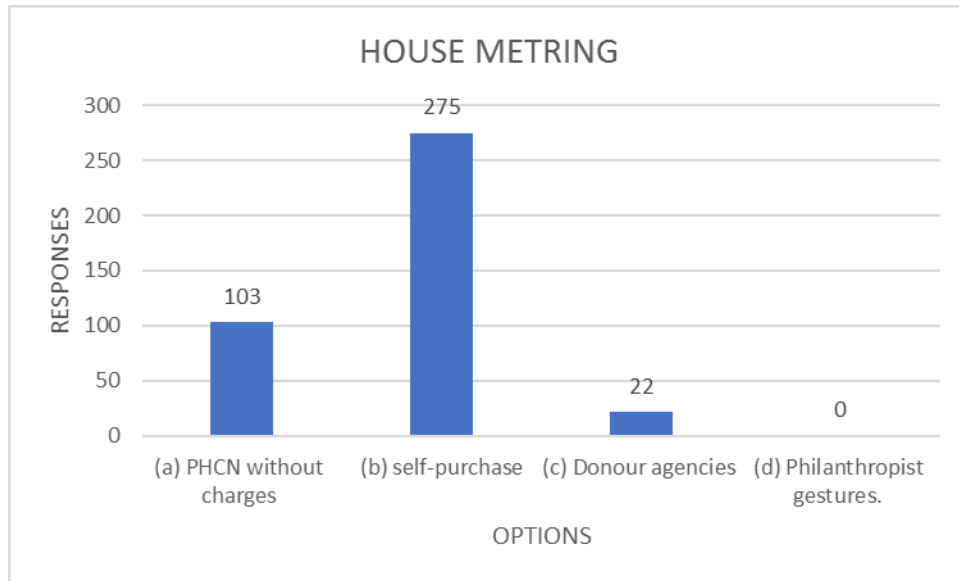


FIG 3B: House Metering

The item in table 3B is about the metering of the people’s houses. From the analysis, 103 respondents (25.7%) said that the meters were supplied to them by the PHCN free of charges, 275 respondents which represent 65.75% purchased their meters themselves and 22 respondents (5.5%) claimed some donor agencies helped to provide them with the meters while none claimed that their homes were provided with meters by the philanthropists. This structure has made customers to be billed higher than their electricity consumption per month because estimated billing does not take into cognisance the hours lost due to power supply failure. The cost implication of the inefficiency of power sector management is being bore by the consumers and this is responsible for their poor responses to the repositioning of the electricity power sector.

4B.The power installation to your house such as electricity poles and wiring is mostly through

Table 4B

Options	Responses	Percent (%)
(a) individual	80	20%
(b) government	25	6.25%
(c) community efforts	270	65.5%
(d) philanthropist	NILL	0
(e) PHCN	25	6.25%
Total	400	100%

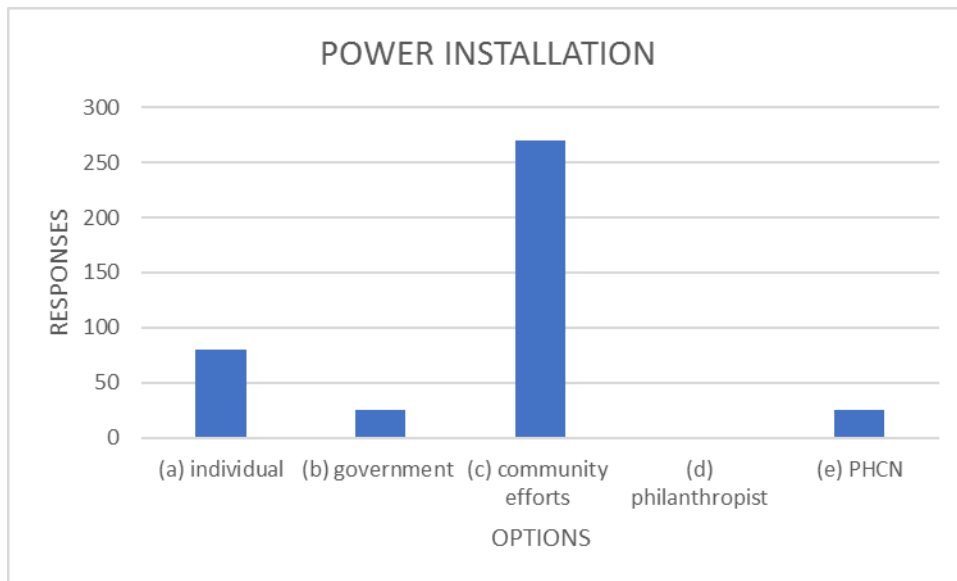


FIG4 B: Power Installation

The figure 4B above is the analysis of power installation in all the locality surveyed from the study in Kogi State revealed that 80 respondents representing (20%) are responsible for the installation of electricity to their houses, 25 respondents (6.25%) ascribed it to the government, 270 respondents (65.5%) believe it is through community efforts and 25 respondents (6.25%) believe that it the PHCN that installed the electricity poles and wires to their areas.

(C) Cost Implication

5B The current electricity bills takes the household income of about :

Table 5B

Options	Responses	Percent (%)
(a) 1-10%	25	6.25%
(b) 10 – 20%	105	26.25%
(c) 20– 30%	65	16.25%
(d) 30-40%	NILL	0
(e) 50% and above	205	51.25%
Total	400	100%

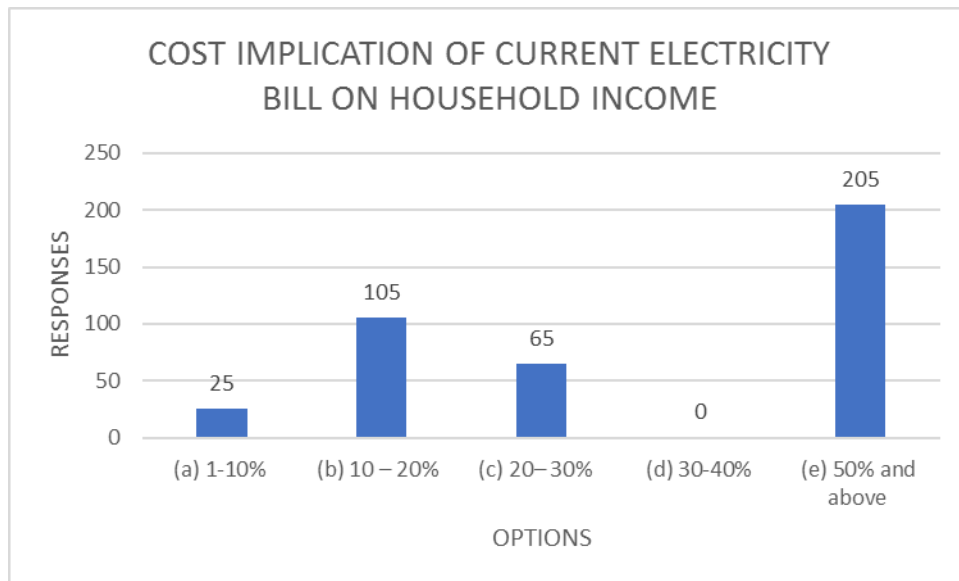


FIG 5B: Cost implication of current electricity bill on household income.

The figure 5B above reveals that cost impact of electricity bill to the household in reference to the household into the. Based on the analysis, 25 respondents (6.25%) said that 1-10% of their income is going into electricity bills, 105 respondents (20.25%) opined that 10-20% of their income is consumed by electricity bills, 65 respondents (16.25%) 205 respondents (51.25%) revealed that 50% and above portion of their income is being consumed by electricity bills. This explains the unabated level of poverty in Nigeria because, most household have income streams far below the national minimum wage of N30,000 per month and in a situation whereby individual residential houses are billed between N5,000 to N15,000 per month will further erode the welfare position of the people. The electricity bills are not in tandem with consumption due to inability of many households to purchase pre-paid meters. The people pay far above actual consumption since, that billing does not reflect hours lost due to power outages.

6B. How can you describe the condition at which you are paying energy bills

Table 6B

Options	Responses	Percent (%)
(a) very difficult	185	46.25%
(b) difficult	62	15.5%
(c) moderately difficult	122	30.5%
(d) affordable	21	5.25%
(e) very affordable.	NILL	0
Total	400	100%

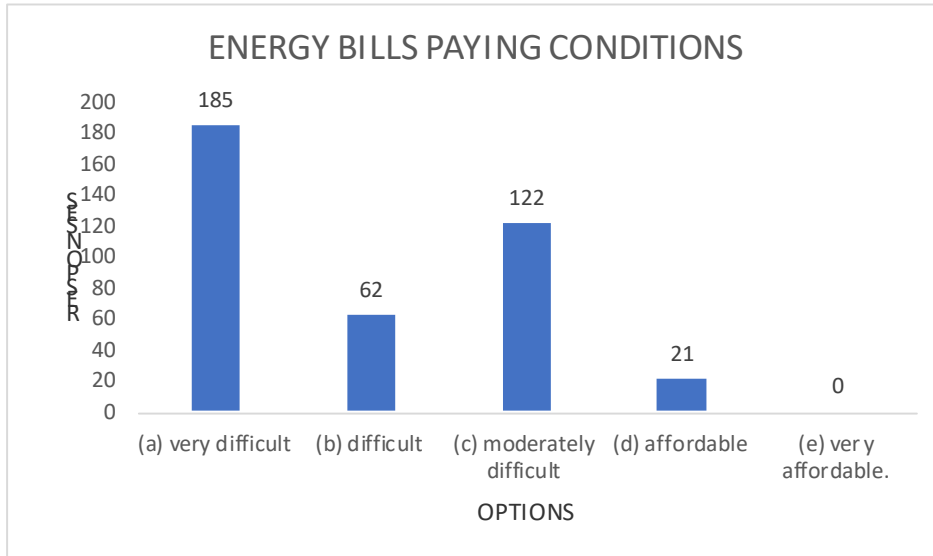


FIG. 6B: Energy bills paying conditions.

The research item on table 6B above is to ascertain the easy or the difficulty at which households are paying the electricity bills due to them. From the findings, 185 respondents (46.25%) find it very difficult to pay electricity bills, 62 respondents (15.5%) said they find it difficult to pay the bills, 122 respondents (30.5%) said it is moderately difficult to pay electricity bills while 21 respondents (5.25%) asserted that they could afford their electricity bills a ease while no respondent claimed that the payment of electricity is very affordable. It has been established therefore that condition of paying the bills is difficult for the people and hence affect the living condition negatively.

7B.What is the major challenge to your footing of electricity bills

Table 7B

Options	Responses	Percent (%)
(a) overrated electricity bills	240	60%
(b) hoarding of pre-paid meter	80	20%
(c) cost of purchasing pre-paid meter	20	5%
(d) poor income stream	20	5%
(e) because of additional cost of fueling power generating plant (generator)	40	10%
Total	400	100%

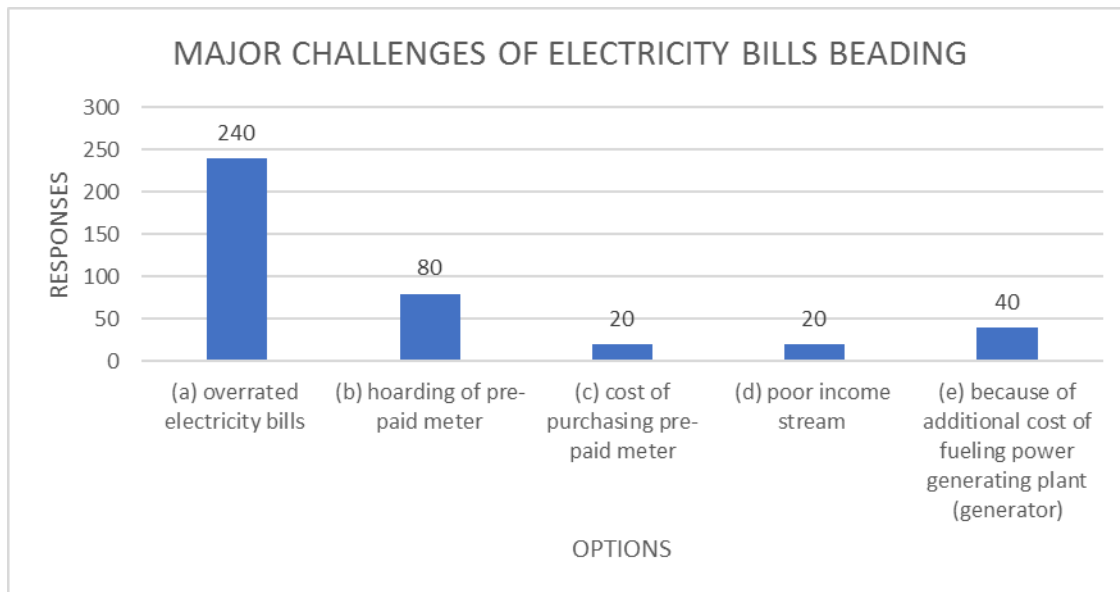


FIG 7B: Major challenges of Electricity Bills Reading

The item on table 7B is aimed at investigating the major challenge which the respondents are confronted with in relation to payment of electricity bills. From the findings, 240 respondents (60%) associated it with the problem of overrated electricity bills, 80 respondents (20%) maintained that hoarding of the pre-paid meter machine makes the field billing method to persist and hence its attendant challenge, 20 respondents (5%) alluded it to cost implication of purchasing pre-paid meter by the household; also, 20 respondents (5%) opined that the income streams of the household is even small that it may not be easy to find the current electricity bills while 40 respondents (10%) said that the major challenge is not just the electricity bills from the energy distribution companies but that, there additional cost of fueling power generators since power supply from the national grid is always unstable and erratic. This can explain various factors fueling poverty prevalence in the country. The burden of the publicly supplied utilities failures are being borne by the populace and this is seen to precipitate the poor lighting condition of the people.

(D) Energy Supply Source

8B. What is the major source of your cooking energy?

Table 8B

Options	Responses	Percent (%)
(a) Direct firewood	120	30%
(b) wood-charcoal	20	5%
(c) kerosene	NILL	0
(d) gas	220	55%
(e) Electricity.	40	10%
Total	400	100%

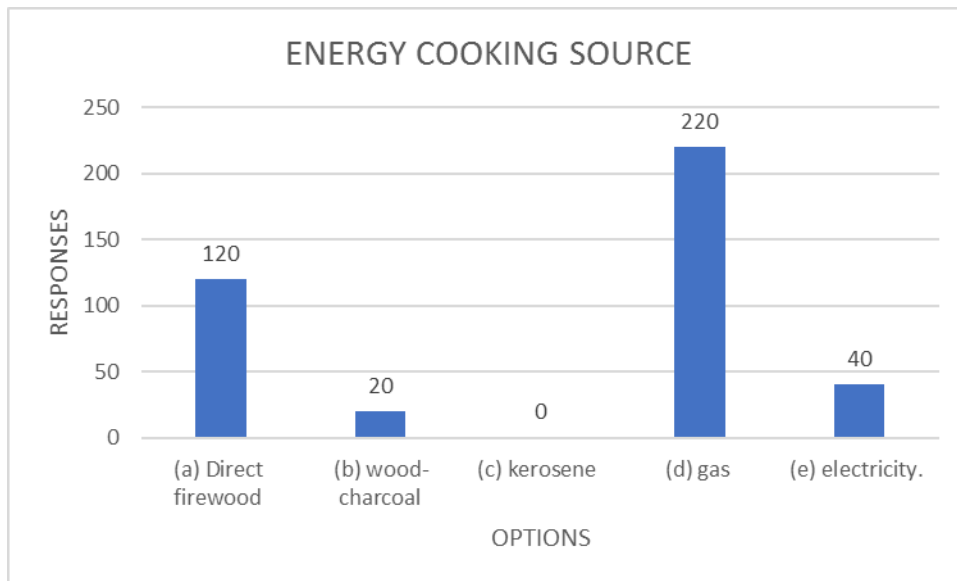


FIG 8B: Energy Cooking Source.

The analysis in table 8B shows the major source of cooking energy to the sampled population and it reveals that 120 respondents (30%) used direct firewood as cooking fuel, 20 respondents which represents 5% use wood charcoal for cooking, 22 respondents (55%) use gas as cooking energy while 40 respondents which constitute 10% use electricity for cooking and none of the respondents use kerosene. The scenario whereby those who are using electricity are just 10 percent of the sampled population creates a serious energy imbalance whereby the use of direct firewood or by-products of wood have been heightened. This has serious implications on environmental sustainability and poverty as well as health challenges to those who use unclean energy sources for cooking. The use of firewood and wood charcoal as cooking fuel has resulted in indiscriminate felling of trees which increases the tendencies of desert encroachment and constitutes a negative implication to the ecosystem. All these practices affect the quest for realization of the Sustainable Development Goals (SDG, 2030).

Discussion of the Findings

From the major findings from the study, it has been established that both the household and business units have been affected adversely by unstable electricity energy supply. This is because of the additional cost imposed either through alternative sources of energy use which are privately provided to argue the non-steady electricity supply. The major alternative energy products available to businesses and households have both economic, social, and health and environmental implications on the end users and social costs on the society in general.

With the above, the Nigerian business environment is not considered as robust enough in terms of social overhead capital which electricity infrastructure is critical. This can explain the retardation of the general investment in the country especially in the small and medium-scale enterprise which ought to constitute the engine of growth in the economy. The resultant effect of this is an unabated level of rising unemployment as well as poverty prevalence in Nigeria which according to NBS (2022), 66% of Nigerians are multidimensionally poor.

Households are directly further made worse off in their welfare position resulting from energy poverty. Energy poverty is defined as lack of access to electricity leading to dependency on biomass for cooking and heating needs (Monyei, Adnumi, Obolo and Sajau, n.d.). Households waste their productive hours fetching for firewood and as such deprive them

of the useful hour which would have been put in other production economic life. The pollution activities of wood or its bi-product constitute health concern for the users in the long run. This pollution is more with the petrol or diesel electricity generating plants used to power residential and business outfits as this produce both noise and air pollution which is very hazardous to health and environment as well undermine to quest for sustainable environment clause of the SDGS 2030.

Conclusion

The economic prosperity of any national can hardly be attained without sustainable energy supply for individual household activities, transportation, commerce, banking, education and effective information dissemination. The nature of Nigeria electricity supply and use has to be changed to meet the need of the Nigeria's economy. There is need to diversify energy products to renewable energy resources to free the national grid from overload by the adoption of wind and solar energy.

Recommendations

Based on the findings, the following recommendations are advocated for efficient energy supply and utilization in Nigeria:

- (1) The energy source has to be diversified away from the overdependence hydroelectricity to solar system and wind power such that local communities can have independent energy source.
- (2) Pre-paid meter: should be supplied to customers not on the basis of ability and hoarding. This will bring about sanity in energy billing system.
- (3) Petroleum products should be made available and at cheaper rate in the short run to reduce cost burden of privately generated energy source with the use of petroleum and disease plants.
- (4) Estimated electricity billing price regime should be stopped and criminalized as it gives room for extortion from the public and lack of drive to stabilize energy supply by the relevant stakeholders.
- (5) This will go a long way to reducing the burden of being bone by the society and hence welfare game on the society.

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