ENABLING URBAN POOR LIVELIHOOD POLICY MAKING: UNDERSTANDING THE ROLE OF ENERGY SERVICES

KaR 8348

COUNTRY STUDY REPORT
NIGERIA

Friends of the Environment
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CONTENTS

EXECUTIVE SUMMARY

'The Enabling Urban Poor Livelihood Policy Making: the Role of Energy Services' project intends to provide a holistic understanding of the role of energy in sustainable urban livelihoods, as well as form a basis for making policies that address these issues. Recent concerns about the urban poor are the result of the realization that majority of the world population in the next two decades would be living in urban areas. This rapid rate of urbanization will generate a large percentage of urban poor whose quality of life will depend on many factors including access to cheap, affordable and efficient energy services. Unless efforts are made to put in place policies that would stem the negative impact of energy on the urban poor, the world faces a major challenge of attaining the Millennium Development Goals (MDGs)

Primary data collected from the field during the study was used to test the validity of the four hypotheses namely: Clean and affordable energy services are important for good physical well being and productivity of household members; Social networks and relationships facilitate access to energy services; Clean and affordable energy services are a key factor in sustainability of livelihoods by increasing viability of existing enterprises and enabling establishment of new ones; Energy sector reforms lead to improved access to clean and affordable energy services by enterprises.

Four communities in two cities were chosen for this study through a multi stage sampling technique. Two of the communities, Ilaje and Amukoko are located in Lagos, an old urban settlement, while the other two, Kwali and Karmo are located in Abuja, a new and merging urban settlement. In all, 451 households and 147 enterprises were surveyed and interviewed in a three-stage sampling method. The first stage involved using systematic sampling design to select streets proportionately to their numbers in each community. At the second stage, simple random technique was used to take sample of enumerated housing units in the selected streets. Finally, systematic sampling method was used to select households

from the selected housing units taking into cognisance the sample size for household and enterprise respectively.

Clean forms of energy that could be available to Nigerians are electricity, gas, and kerosene plus renewable energy sources such as solar power, wind power, hydropower and biomass. Despite the country's high potential to generate and make these energy services available to the people, government's incapacity to do so has generated great pessimism among the populace. Most households depend on electricity as a major source of energy because it is mainly used for lighting and most of the women in the surveyed communities (being food processors and petty traders) spend a substantial amount of time outside of their homes. Nigerians in the sampled communities acknowledged electricity as their preferred energy form and this is used mainly for lighting. The availability and access to electricity supply is acknowledged to play an important role in facilitating household activities like lighting, washing, bathing, ironing, grinding and entertainment etc. For cooking, however, kerosene which is more expensive than fuelwood is widely used because of the compact nature of their dwellings and the dangers associated with cooking with fuelwood inside the dormitory type of housing where they live and cook. In enterprises of the surveyed communities, energy forms such as fuelwood and kerosene are the important forms of energy used. The use of kerosene for cooking by a majority of respondents in Lagos may be attributed to this factor. The people sampled however acknowledged that kerosene stove usage constitutes a health hazard to users, particularly when used indoors and with a daily exposure of 1 to 3hours daily. Their preference for cleaner burning fuels such as LPG and electricity revealed the level of awareness of the community members on the environmental and health benefits of cleaner burning fuels. In addition, clean and affordable energy services are recognized by the people as important for their well being and productivity of their household members.

An analysis of the social characteristics of the people sampled in the study shows that about 52 percent of respondents belong to either a Christian or Muslim organization. In addition, they belong to Cooperative Societies (9 percent), Social Clubs (8 percent) and Business Association (4.5 percent). In general, it was discovered that some respondents membership of these organizations facilitate access to energy services either in terms of supply or repair and/or maintenance. It is acknowledged that membership in these organizations extend to technicians/electricians who provide their services at discounts when their members desire their services. In this regard, we concluded that social networks and relationships to a certain extent facilitate access to energy services.

With respect to the third hypothesis of the study, it could be stated that different enterprises depend on different combinations of energy services. Pottery involves the use of various energy technologies and utilizes kerosene and fuel wood as major sources of energy. Potters do not use gas which, although is a cleaner fuel, is not affordable. Fish processing has been affected by the increase in fuel price, particularly as it relates to income and growth in business size. Because of the inability of fish harvesters to move their engine boats to filling stations for fuel due to government's policy, fisher folks have to buy petrol in jerry cans at usually higher than normal prices, while fish smokers use fuelwood. Fuel wood is the major source of energy for frying bean cake (*akara*). Increase in wood price has negatively affected the growth of these enterprises as more money is spent on fuel. Fuel wood and kerosene are major sources of energy for cassava meal (*fufu*) making. Increase in kerosene prices has affected this enterprise adversely but entrepreneurs are willing to endure the hardship this has placed on their living conditions. The entrepreneurs believe that government's help in accessing credit can promote the profitability and growth of their businesses. Also, reduction in the prices of petroleum products and electricity tariff will enhance the growth of their businesses. Our findings from the study established a strong link between energy services and the viability of enterprises, as well as the establishment of new ones.

The Nigerian government is currently implementing public sector reform programmes geared towards reducing poverty, eradicating corruption, and empowering the private sector to become the engine for economic growth in Nigeria. This reform initiative called the National Economic Empowerment and Development Strategy (NEEDS) has identified the deregulation of the downstream oil sector a key aspect of the reform programme. This is to allow market forces to determine the prices of petroleum products which government has consistently claimed to be heavily subsidized, even though critics refer to it as opportunity cost since the government is not losing money from either sales of crude oil or sales of locally refined products. For instance, a comparison of petroleum products prices with other OPEC countries revealed that in 2003, Nigeria has the highest prices for petroleum products among this club of oil producing nations. While most of the countries have maintained their prices, prices in Nigeria have increased substantially between 2003 and 2005. The impact is increased dependence of the poor on less efficient energy sources such as fuel wood that are cheaper and that the poor can afford.

An important thrust of reforms enunciated in NEEDS is the commercialisation and privatisation of the energy sector. This will make energy products more readily available to enterprises, albeit at a higher price, at least in the short run. The consequence of this for the poor in terms of access to energy services is most likely to be negative. Nevertheless, our findings revealed that energy sector reforms should lead to improved access to clean and affordable energy services by enterprises if transparently implemented. All that is needed is to initiate pro-poor initiatives that would enable the poor to improve their lot by having access to these cleaner and more efficient energy sources than hitherto available to them. In addition, focused educational programmes would need to be implemented to raise people's awareness about the comparative advantages of more efficient energy sources than fuel wood and create opportunities for their wide adoption.

Acronyms and Abbreviations

DFID	Department For International Development, UK
ENERGIA	International Network for Gender and Sustainable Energy
GDP	Gross Domestic Product
GHG	Greenhouse Gas
KaR	Knowledge and Research
LPG	Liquefied Petroleum Gas
NGO	Non Governmental Organisation
NLC	Nigeria Labour Congress
NAPEP	National Poverty Eradication Programme
NEEDS	National Economic Empowerment and Development Strategy
NNPC	Nigeria National Petroleum Corporation
OPEC	Organization of Petroleum Exporting Countries
PMS	Premium Motor Spirit (Petrol)
PPPRA	Petroleum Products Prices Regulatory Agency
SLF	Sustainable Livelihood Framework
TDG	Technology and Development Group, University of Twente
TOE	Tonnes of Energy Equivalent
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

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We therefore wish to thank DFID and ENERGIA for providing the funding required for carrying out this project. We acknowledge the role of Dr. Joy Clancy of TDG for nominating Friends of the Environment as the lead organization and Coordinator of the project in Nigeria. Our appreciation goes to our colleagues, Ms. Feri G. Lumampoao and Ms. Tanya Andrade, the study leaders in the Philippines and Brazil respectively for their contribution to the success of this project. We also wish to thank our researchers and experts who worked tirelessly to see to the success of this project.

Finally, we acknowledge with thanks the support of our local collaborators. The Energy Commission of Nigeria (ECN) provided us with technical support during our primary data collection. The statisticians of the Lagos State Central Office of Statistics, Ministry of Economic Planning and Budget also assisted us in the analysis. There are other individuals and organizations too numerous to mention here that gave us support. We thank you all.

CHAPTER ONE: INTRODUCTION

1.1 The socio-economic context

Nigeria's current population is estimated to be about 130 million. This is based on the 1991 figure of 89 million with an annual growth rate of 2.8%. Women constitute about 51% of the population total, but they generally have lower social status than their male counterparts. The country's gender development index was below 0.425 in 1998, which was lower than the average for the Sub-Saharan Africa (0.459).

The Nigerian economy is unwholesomely dependent on oil, earning the country up to 98 percent of foreign exchange receipts. This has rendered the economy highly vulnerable to external influences. In particular, the high revenue receipts from crude oil export in the late 1970s and early 1980s induced an unsustainable spending profile which proved catastrophic when international petroleum price crashed in 1986. This induced massive dislocation in the economy and, coupled with massive mismanagement, External debt currently stands at about US$35 billion despite the fact that over a period of 35 years, the country has earned about US$350 billion from oil resources. Because much of the resources earned from oil was not used for meaningful development, poverty continues to be pervasive, and the access of people to efficient energy services and sustainable livelihoods remains poor. Nigeria has low socio-economic indicators. It ranked 151st out of 187 countries surveyed in 2004 by the United Nations Development Programme with a low human development index of 0.43. In the Human Development Index just released by UNDP, life expectancy has reduced from 51 years to 43!

To improve the lot of the people government is currently implementing public sector reform programmes geared towards reducing poverty, eradicating corruption, and enabling the private sector to become the engine for economic growth. The reform initiative is elaborated in the National Economic Empowerment and Development Strategy (NEEDS), which is the country's home-grown equivalent of the Poverty Reduction Strategy Paper (PRSP). Privatization is a key aspect of the reform programme and will be strengthened by the Fiscal Responsibility Act and the Public Procurement Act. The expected outcome will be greater efficiency in the real sector and improved service delivery by the public sector.

1.2 Nigeria's energy mix

Nigeria is well endowed with energy resources. The main energy resources are crude oil, natural gas, coal, tar sand, biomass and other renewable energy resources such as solar energy, tidal and wind power, as well

as large hydroelectric potential. Proven crude oil reserves stand at about 40 billion barrels, and this is expected to reach about 55 million barrels in the very near future. There is also an abundant natural gas resource, which currently stands at about 2.7 billion cubic metres. The estimate for tar sand deposits stands at about 31 billion tons, while coal resource estimates are estimated to be between 2 and 10 billion tons.

The combined micro, mini, small and large hydroelectricity potential of Nigeria is estimated at 10,000 MW. The potential annual sustainable yield of wood in Nigeria is estimated to be about 22 million cubic metres, while total biomass potentials consisting of animal and agricultural wastes, as well as wood residues has been estimated to be about 1931 million tons in 1990. The biomass energy potential is capable of generating 1.2 PJ of energy. In addition, about 1,500 PJ (about 258 million barrels of oil equivalent) could be available to Nigeria annually from solar energy if solar appliances with 5% conversion efficiency were used over only 1% of the total land area of the country for about six months of the year. In a similar vein, there are indications that annual wind energy potential ranges between 1,000 and 97,000 kWh in the country while the potential for geothermal energy is also high.

Despite the abundance of oil and gas and high potential for hydro-electricity, Nigeria still depends to a large extent on traditional energy sources such as fuel wood, bagasse and crop residue for its domestic energy needs. Nigeria's fuel wood consumption is estimated at about 80 million cubic meters (about 25 million tonnes). Fuel wood is widely used for heating and cooking, cottage industrial applications and food processing. Currently, these traditional energy sources account for about 55 percent of Nigeria's primary energy requirements (Figure 1.1), even though they are usually not included in a country's commercial energy consumption calculations. This is because their importance decreases as the country's economy transforms. Commercial energy sources in Nigeria include oil and gas, electricity and coal. Their relative importance in the national economy is now discussed.

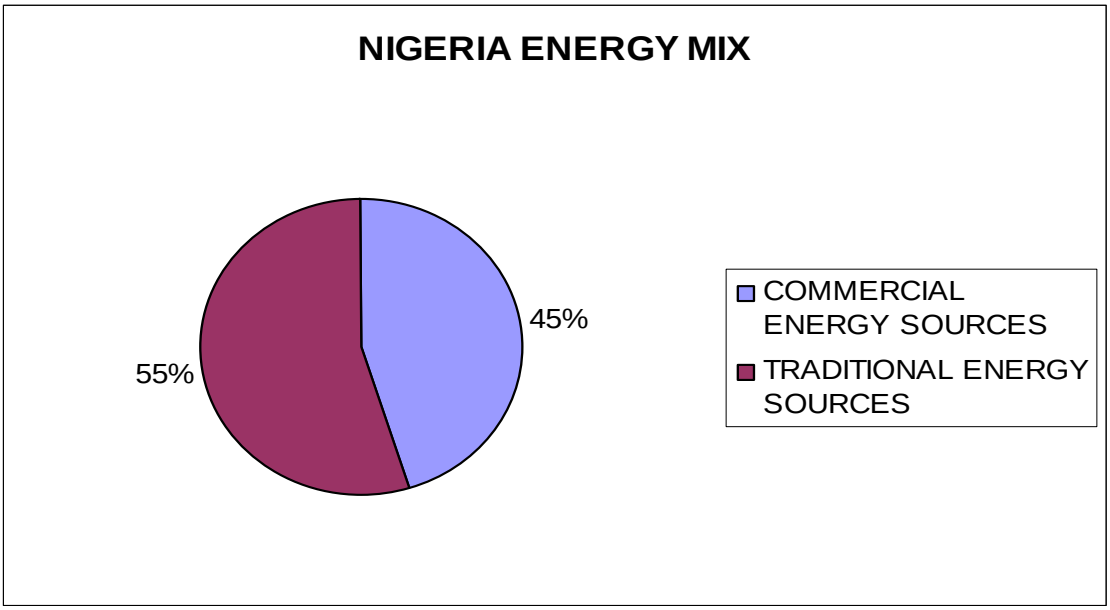


Fig. 1.1: Nigeria Energy Mix (Source: Energy Commission of Nigeria (ECN) 2001)

1.2.1 Oil and Gas

Currently, Nigeria has a proven reserve estimate of about 40 billion barrels of oil and about 180 trillion standard cubic feet of natural gas (scf). Nigeria's proven and probable crude oil reserve is about 55 billion barrels (World Bank 2004 Report). Daily oil production is about 2.4 million barrels while natural gas production is about 4 billion standard cubic feet. It is estimated that daily total natural gas production will increase to 6 billion standard cubic feet (scf/d) in 2009, while gas sales will increase from 200 million scf/d to 3.5billion scf/d over the same period. Natural gas is utilized in many ways in Nigeria. About 45 percent of daily production is flared, while the balance is exported by the Nigeria Liquefied Natural Gas Company (NLNG) and sold to thermal power stations and other industrial users as fuel. The National Electric Power Authority (NEPA), the country's sole power company, utilizes about 70 percent of natural gas consumed in the country for power generation. Government controls the price of Natural Gas sold for use as fuel and feedstock in the domestic market. These prices are often set on a discretionary, non-transparent basis and do not reflect the component element of end-user pricing. NEPA purchases gas from the Nigerian Gas Company (NGC), which is a subsidiary of the Nigerian National Petroleum Corporation (NNPC) at about N15/mscf while other commercial and industrial users like West African Cement Company pay as much as N400-N500 for the same unit of natural gas. Therefore, the power sector does not provide encouraging signals for private investment for the supply of gas to other optimal sites for power plants. The NGC has been threatening for years to remove this price dichotomy and NEPA on its part has threatened that any increase in the price of natural gas will result in substantial increase in its

regulated tariff structure. The current gas pricing arrangements have therefore resulted in difficulties in establishing potential returns from investment in different activities in the gas supply chain. This poses a major challenge to Nigeria's privatization drive.

1.2.2 Petroleum Products

Nigeria has four refineries with a total installed capacity of about 445,000 barrels per day. The product yields from these refineries are petrol (PMS), diesel, kerosene, LPG, asphalt etc. Since the early 1990s, capacity utilization at these refineries has declined considerably due to ageing facilities, vandalisation of oil pipelines, corruption in the management of these refineries among others. For example, in 2002 the NNPC supplied 79 million barrels of crude (160 million barrels at full capacity) to the refineries to process the following products shown in Table 1.2.

Table 1.2: Petroleum Products Production in Nigeria (2002)

Product	**Production (tonnes)**
LPG	199,359
Petrol (PMS)	2,626,916
Kerosene (DPK)	1,532,408
Diesel (AGO)	2,513,521
Fuel Oil	2,580,284
Intermediate Stock	489,330

Source: NNPC

PMS production in 2002 translates to 3.9 billion litres against the annual demand of about 10.95 billion litres (30 million litres per day). Nigeria therefore suffers a shortfall of about 7 billion litres that has to be met from imports. Since the mid 1990s, Nigeria has resorted to imported refined petroleum products to meet local demands. However, fluctuating international prices of petroleum products as well as the devaluation of the Naira has made it difficult to sell at politically correct prices at the pump.

Liquefied Petroleum Gas (LPG) is a cleaner burning fuel than PMS, but its production in Nigeria is also refinery dependent. Thus problems affecting the refineries also effect LPG production. The combined annual LPG capacity of the four refineries is 488,000 tonnes. However, in 2002, the refineries cumulatively produced at an average of 40 percent and thus supplied only 199,359 tonnes of LPG. This has been the trend in the past decade. Nigeria's consumption of LPG has been increasing since 1980. This can be attributed to the convenience and attractiveness that LPG has over the other energy sources to the

middle to upper class urban dwellers. LPG production, which equals consumption in 1981, was 48,000 tonnes. This increased to 91,000 tonnes in 1987 and with the campaign by government to popularise gas usage, consumption rose to 156,000 tonnes in 1990. In 1991 consumption was estimated at about 175,000 tonnes while 199,359 tonnes was consumed in 2002. Actual LPG demand in Nigeria is suppressed due to supply problems, ranging from the poor state of the local refineries to lack of logistics to move products stocked at the off-shore natural gas plants. More than 80% of the national consumption is sourced from imports. Nigeria's consumption per capita (1.66kg in 2002) is still low when compared with those of some African countries not to mention developed Western countries. According to a recent World Bank Report, the target for the revitalization of the domestic LPG market in Nigeria is to achieve a per capita consumption of 3.7 kg/annum. This would result in an annual consumption of about 462,500 tonnes. Government, in response to the World Bank report on the need to divert some export bound products for domestic consumption, recently approved about 350,000 tonnes of Butane per annum from the Exxon/Mobil facility be allocated to the domestic market.

The reason for the low demand of LPG is that traditional fuels are still widely used in the rural areas while in the urban areas, demand is hampered by scarcity and irregular supplies. The market regularly experienced scarcity of products when refineries breakdown or stopped production for any reason. The popular 12.5-kilogram cylinder currently sells for over N3, 000 (US$23) which is double its 2004 price.

1.2.3 Electricity

Grid electricity in Nigeria is over 100 years old, and started in 1846 when two 30 kilowatt generating units were installed in Lagos. In 1973, NEPA was formed from the merger of the Niger Dam Authority (NDA) and the Electricity Corporation of Nigeria (ECN). Currently, NEPA has an installed capacity of about 6,000 MW (compare this with South Africa's installed capacity of 42,011MW in 2003) from which only about 4,000 MW are available for distribution, even then not on a continuous basis. Another 33 percent of electricity capacity are lost to ageing and broken down equipment, vandalization of NEPA equipment and poor management associated with public enterprises in Nigeria. The current per-capita availability of electricity to Nigerians is only 0.33kw (20kwh). This is quite low and thus explains the agony Nigerians who depend on NEPA have to go through. In late 2004, a proposal was made by the Federal Executive Council to the legislature for NEPA to be broken into 18 semi-independent units responsible for generation, transmission and distribution. The Power Sector Reform Act was passed in 2005.

1.3 Nigeria's energy crisis: The epitome of inappropriate petroleum pricing and inefficient electricity sector

The Nigerian upstream and downstream petroleum industry is faced with a myriad of problems. While operators in the upstream sector like Shell, Mobil-Exxon, Chevron-Texaco, are faced with community unrest in their operational areas mainly in the Niger Delta, the downstream sector is faced with problems of strikes and protest associated with issues concerning appropriate pricing, subsidy (real or imagined), international fuel price vagaries, declining value of the Naira, and local logistic problems. In particular, the pricing of petroleum products plays a prominent role in the energy crisis that has engulfed the country.

Appropriate pricing for petroleum products has been the refrain of the Nigerian government since 1998. The aim of deregulation in the downstream sector according to government is to forestall smuggling of products across the borders by achieving price parity with neighbouring countries and save funds currently applied in subsidizing imports. In the first deregulation wave in December 1998, PMS price rose from N11 to N25 per litre, diesel from N9 to N23 per litre and kerosene from N6 to N23 per litre. But after strong protestations by the Nigerian Labour Congress (NLC), the prices were on January 6, 1999 reduced to N20, N19 and N17 for PMS, diesel and kerosene respectively. Deregulation of the downstream petroleum sector has been a major policy objective of this government where petroleum marketers will be allowed to import and sell refined products based on import parity. Because it will be free entry and exit, it is believed competition will eventually drive the prices of the imported commodity down. Hence, in October 2003, the government petroleum product price regulator, the Petroleum Products Prices Regulatory Agency (PPPRA), announced the full deregulation of the downstream sector.

While marketers imported and sold diesel and kerosene at international price parity which currently translates to about N69 and N64 respectively, they have been unable to do so for PMS for which the government fixed a price band which does not match the international price regime. Government has been unable to fully deregulate the price of PMS due to the agitation of labour. Nevertheless, the sector has witnessed frequent price adjustments between 1991 and 2004, as indicated in Table 1.3. The overall effect is a price increase of over 450% in 10 years (see Table 1.3), as a result of poor performance of local refineries and heavy dependence on imported PMS.

The unit price of kerosene a favourable fuel of the poor took a quantum leap from N17 in 1998 to N64 per litre in 2003. This has made the price of kerosene to be higher than that of petrol, an abnormality which was observed by the president who in October 2004 ordered a price reduction for kerosene. This directive is yet to be complied with by the NNPC and the oil marketers. The high price of kerosene has made many women to crave for lower and cheaper sources of energy like fuel wood for their domestic needs despite the associated health implications, but the living condition in most of the households does not encourage the use of fuel wood because of space problem associated with the dense population in the communities.

Diesel is used in industries to power their generators and run other equipment. NEPA has fed Nigerians with unstable and unreliable power over the years. Power supply has gone so bad that lately, power supply could be as little as 4 hours a day. The high price of diesel has driven many industries out of business and the ones that strive to continue are forced to operate at fractions of their installed capacities.

Table 1.3: Price Changes for PMS in Nigeria (1989 – 2004)

Date	Price/Litre	% Change
March 6, 1991	N.70	-
November 8, 1993	N5.00	+614
November 22, 1993	N3.25	-35
October 2, 1994	N15.00	+361
October 4,1994	N11.00	- 26
December 20, 1998	N25.00	+127
January 6, 1999	N20.00	-20
June 1, 2000	N30.00	+50
June 8, 2000	N25.00	-16
June13,2000	N22.00	-12
January 1,2002	N26.00	+18
June 20,2003	N40.00	+53
July 9, 2003	N34.00	-15
October 1, 2003	N42.00	+24
May 29, 2004	N49.90	+19
October 2004	N52.00	+6

Source: Adapted from a submission by a national activist lawyer Gani Fawehimni

A major determinant factor for the consistent increase in the price of PMS in the last decade is government's desperate attempt to achieve price equilibrium between Nigeria and her neighbours in order

to discourage the illegal smuggling of the products across the borders. More than 60 percent of crude oil production in sub-Saharan Africa is concentrated in Nigeria and the country's refining capacity is more than half for the West African sub-region. Nigeria is thus the largest producer and refiner of crude oil in the sub-region. In addition, as shown in Fig. 1.2, there is a large price differential between Nigeria and her neighbours. For example as shown in Fig. 1.2, while a litre of PMS costs N52 per litre in Nigeria, it sells for about twice the amount in Cameroon and Niger, while it is about one and half times in Benin Republic and Togo. This has encouraged large-scale illegal product export from Nigeria to her neighbours. This has also been responsible for the price distortion within the sub-region and the major cause of regional inefficiencies as refineries in other neighbouring countries are forced to close down due to low patronage. The Nigerian Government's attempts to curb smuggling of petroleum products has met with limited success due to massive corruption among the Nigerian security agencies who are reputed to abate in these smuggling activities. The major option for government was to use price instrument.

The Nigerian government always claims petroleum products prices are subsidized. Critics on the other hand claim that what the government calls subsidy should appropriately be referred to as opportunity cost since the government is not losing money from either crude oil sales or locally refined products sales. The lack of recourse to facts and data when speaking of oil subsidy in Nigeria has made governments position weak and untenable. Comparison of petroleum products prices with other OPEC countries (Figure 1.3-1.5) revealed that in 2003, Nigeria has the highest prices for petroleum products among this club of oil producing nations. While most of the countries have maintained their prices in Nigeria have increased substantially between 2003 and 2005.

In the short- to medium term, Nigeria's petroleum products prices would remain high with respect to the OPEC nation's price regime. This could be seen from the government policy that seems to favour the importation of finished product instead of refurbishing the local refineries and expanding local production capability. The planned privatization of the refineries has not materialized after three years in the works and the planned involvement in the building and operation of refineries by the private sector has also failed to materialize. About 18 approvals/licenses were granted private companies by government since 2000 to establish private refineries, but to date, none has taken off. Reasons for this range from frequent government policy changes, instability in the Niger Delta and inability to raise the huge funds required for such capital intensive venture. Meanwhile the problems in the industry continue and Nigerians are the worse for it.

Figure 1.2: PMS retail prices in some selected African countries

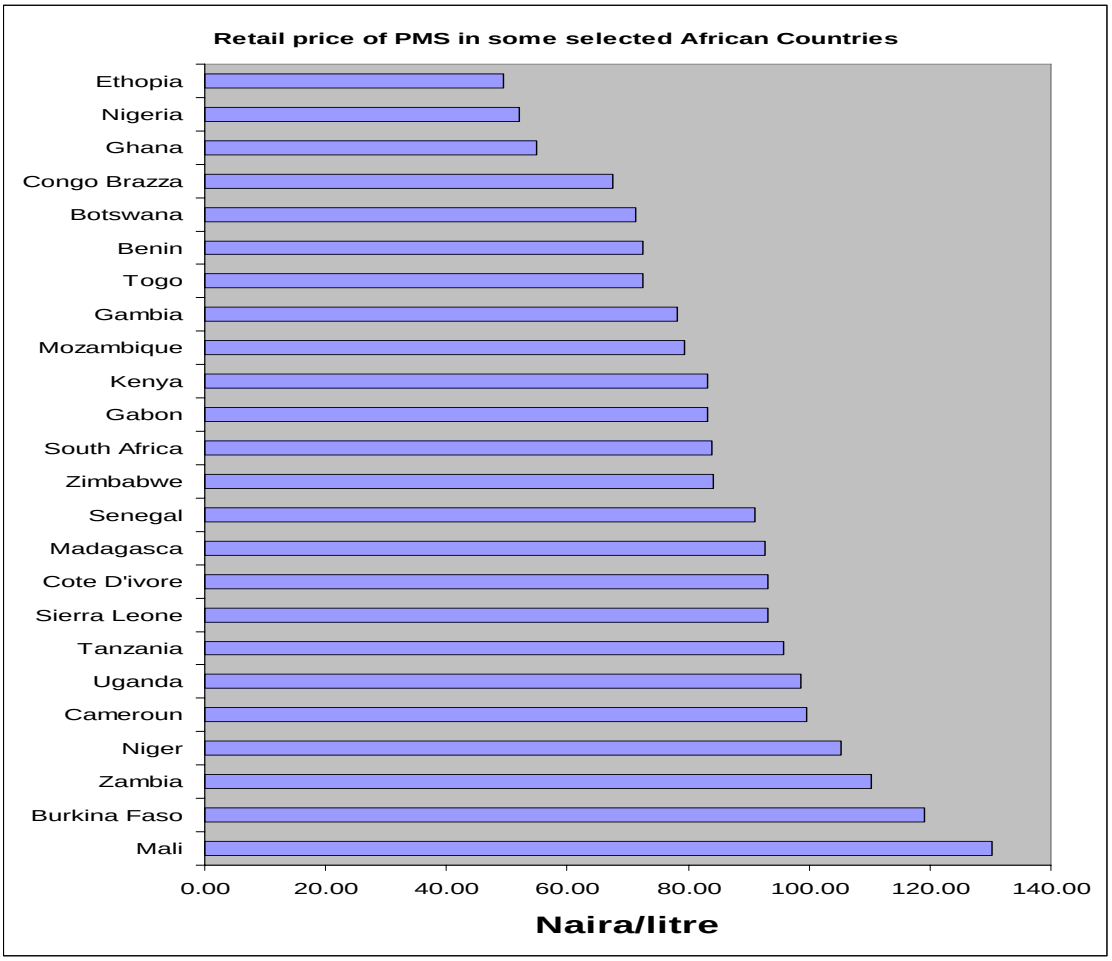
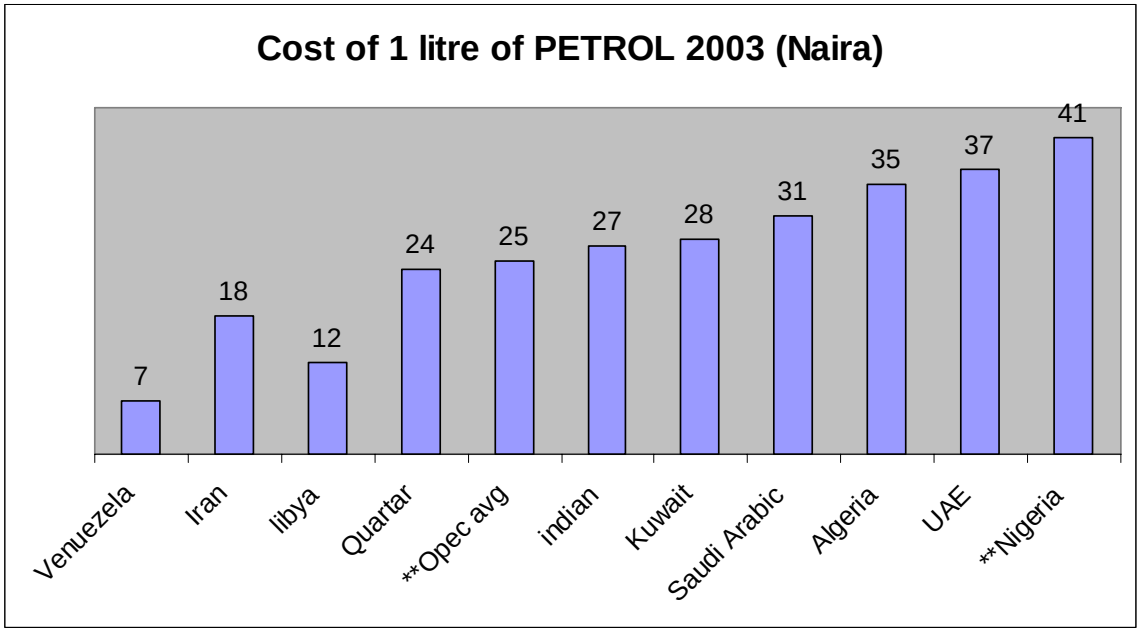
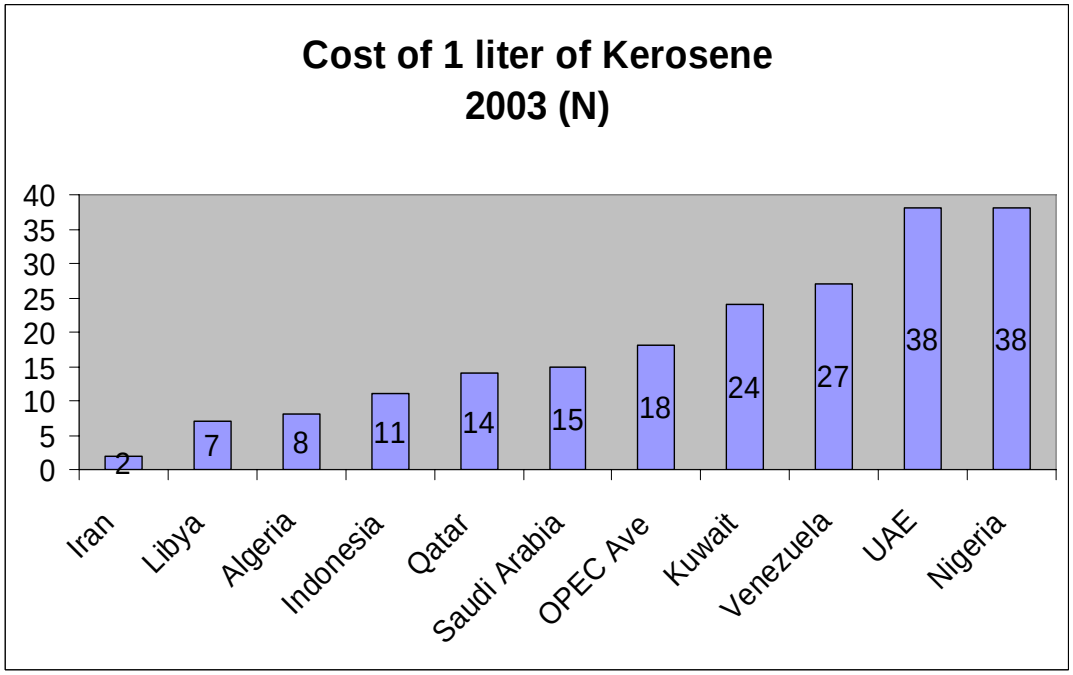


Figure 1.3: Cost per litre of PMS for some selected countries



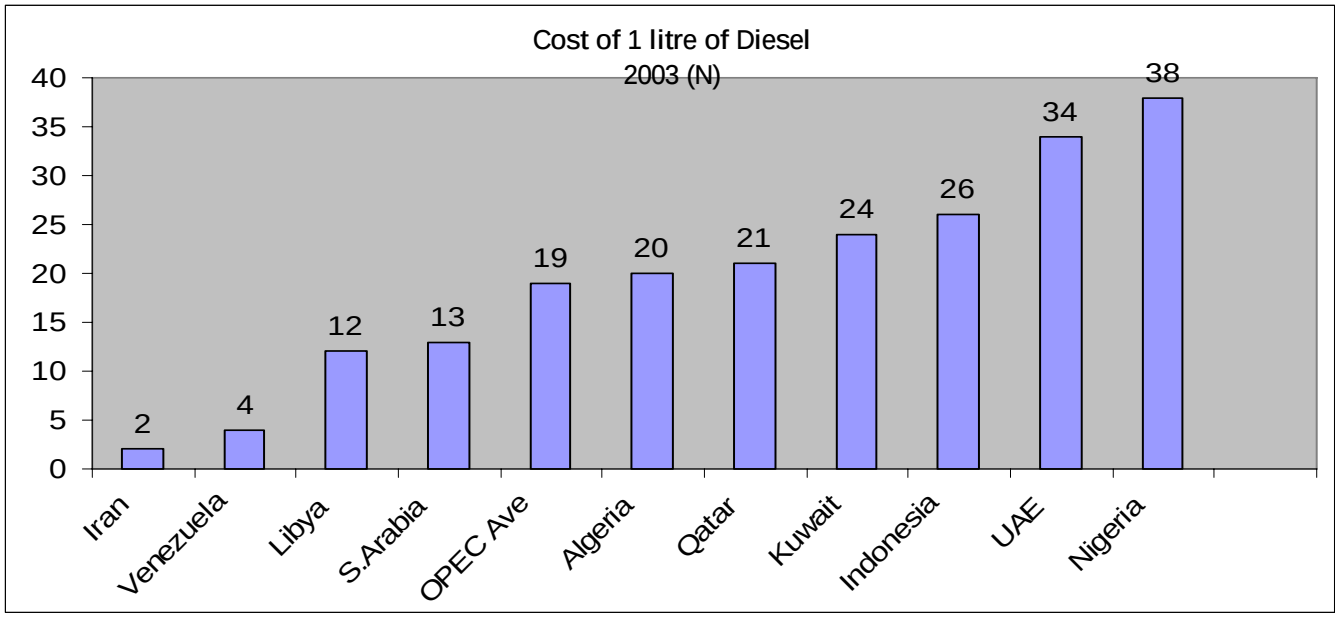
**In 2005 a litre of Petrol sells for an average of about N52

Figure 1.4: Cost per litre of Kerosene for some selected countries



** In 2005 a litre of Kerosene sells for an average of N65

Figure 1.5: Cost per litre of diesel in some selected countries



**In 2005, a litre of Diesel sells for an average of N69

The energy crisis in Nigeria is further reflected in the performance of its electricity sector. NEPA's current generation capacity is just 4000 megawatts while government's target is 10,000 MW by 2007. But this seem a tall order, given NEPA's antecedents and as it has so far defied all stimuli to improve on its efficiency. Power supply is so epileptic that some industrial concerns have been forced to generate all their power, while less than one percent of Nigerians use electricity for cooking. NEPA tariff band is currently between N4 – N6.50 per kilowatt-hour for domestic and commercial rates. Industrial tariffs are much higher. A proposal for substantial increases in its tariff structure has been with government since 2003, but government has been hedging on this proposal until NEPA improves on its service delivery. NEPA as currently structured is not sensitive to the market and its service delivery is among the worst amongst government agencies. What may salvage NEPA is its total deregulation that will allow full participation of the private sector. However, there is no way the private sector can be involved without serious restructuring of the sector. As the situation currently stands it appears that government has the

belief that once NEPA is unbundled, the problem will be solved. Nothing can be farther from the truth. The approach has to be more radical since no investor will invest hard earned funds into the present uncertainty. Even the cost of natural gas to utilities is yet to be decided. It is certain that private investors will desire a more conducive operating environment before investing their funds. This will have to do with both the legal environment and the political will of government to sustain policies that will guarantee stability in the system. The question now is how far can government go to meet these demands?

1.4 National Energy Policy Thrust

The Nigerian National Energy Policy was finally approved in 2004 after about 20 years in the works. The first draft Energy Policy was produced by the Federal Ministry of Science and Technology in 1984. The then newly established Energy Commission of Nigeria (ECN) in furtherance of its mandate produced a draft National Energy Policy in 1993. An eleven-man inter-ministerial committee reviewed the draft policy in 1996 and again in 2001 to incorporate major energy-related national development trends.

The National Energy Policy recognized the need for energy security and called for the diversification of the country's energy supply mix. It recommended that the development of alternative fuels from locally available energy resources should be pursued. The policy recognized the role of private sector participation in the areas of building, maintenance, and refurbishment of energy supply infrastructure. It believes that increased private sector participation will attract new investments, and solve much of the management problems associated and experienced under public ownership. It thus called for both deregulation and privatization of the vital energy sectors. The National Energy Policy appreciates the need for effective coordination of the various energy sub-sectors. In this respect, the establishment of the ECN for the coordination of energy sector activities is a major development. A nine-point objective of the energy policy was enumerated and these range from the development of the nation's energy resources to guaranteed adequate, reliable, and sustainable supply of energy, to the process of acquisition and diffusion of technology and management expertise.

The Nigerian National Energy Policy recognizes the multi-dimensional nature of energy and addresses diverse issues for the optimal utilization of the nation's resources for sustainable development. However, issues about the present and the future energy needs of the urban poor, **women and children**, the rural population and other vulnerable groups need to be properly addressed.

During the preparation of the policy, FOTE submitted a memo to ECN on gender issues, but unfortunately, nothing was included from the memo. We still continue to pressurise ECN to make sure future versions are engendered. As Annecke (1999)[1] pointed out, the energy sector has been slower than other development sectors, such as water, land and health, to understand the necessity of involving women in project and policy design and implementation in order to achieve maximum benefit and ensure the sustainability of development goals.

As already pointed out, biomass, consisting mainly of fuel wood, dominates the structure of energy consumption in Nigeria. It accounts for over 65 per cent of the total final energy consumption. The present pattern of energy demand structure has a serious implication for efficiency. Biomass conversion for cooking and heating is generally inefficient in terms of energy conversion. Energy consumption per capita in Nigeria stood at a low 138 kg of oil equivalent with an energy intensity of 0.476 in 1990. This is a low figure even by the developing world standard, and demonstrates that the pattern of energy use over the years in Nigeria has been economically wasteful. Thus although Nigeria is endowed with rich oil, gas and hydro resources, access to electricity is low, and where available, supply inefficient. The national utility, National Electric Power Authority (NEPA), is unable to meet the demand for electricity. This results in high economic burden on firms and households. To address the long-standing problems of the energy sector, government has given prominence to the role and importance of energy in the economic development of the country. To this end, a number of reforms in the energy sector have been elaborated in the National Economic Empowerment and Development Strategy (NEEDS).

A comprehensive programme of reforms and investment has been launched. A new Electric Power Sector Reform law has been enacted under which NEPA is being transformed into several companies. A newly established National Electricity Regulatory Commission will regulate these companies. The overall goal of the reform in the energy sector is to improve power availability, enhance efficiency of supply and improve people's access to electricity.

1.5 The imperative of energy for poverty reduction

Energy is of little interest in itself. But energy facilitates all human endeavours, and it is essential to life. It is used for a number of activities that are dear to humanity. It is used for heating and cooling, illumination,

[1] Annecke, (1999) --reference to be provided.

health, food, education, industrial production and transportation. In all ramifications, the development of human society and civilization has been shaped by energy.

The use of energy is a necessary and vital ingredient of socio-economic development and economic growth. In general, energy can contribute to widening opportunities and empowering people to exercise choices. On the other hand, its absence can constrain both men and women from contributing to development. Thus, relationships have been established between energy and major socio-economic global issues such as poverty, gender disparity, population, food security, health, environment, economy, and security.

The energy-poverty nexus is obvious. People living in poverty primarily use wood, dung and other biomasses for their energy services, and tend to use less electricity and liquefied petroleum gas than those that are better off. Energy, poverty and social equity are intricately linked and intertwined. For instance, the lack of access to modern fuels and electricity emblemises poverty. Energy deprivation hampers people's prospects of escape from poverty trap. Conversely, improved energy services can help to increase incomes and create wealth to uplift the lives of people and reduce the number of people living below the poverty level.

Access, affordability and choice are the critical energy issues in poverty reduction. Poor people often have a limited choice of technologies that convert energy to useful services. Usually, the technology available to them are typically inefficient and/or of low quality, for example fuel wood. Access of the poor to electricity, which is the most sought after source of energy, is often limited because of high cost. The poor usually lack the purchasing power in the absence of financial support and alternatives. Thus, most poor people currently meet the bulk of their energy needs by collecting fuel wood, biomass and other less efficient energy sources, thereby foregoing the benefits of energy services that could have been used to promote income generation and poverty reduction. In general, therefore, the poor suffer from what is regarded as "a *vicious circle of energy poverty* whereby the inability to buy energy services results in low productivity, low quality of outputs and an inability to release labour for economic activity which, in turn, lead to low returns on investment and labour inputs, again limiting the capacity for energy investment"[2]

[2] K. V. Ramani, 2004. Energy for sustainable development: Challenges for Asia and Pacific and lessons from UNDP projects in the region in *Energy for Sustainable Development in Asia and the Pacific.* UNDP. p.6

But relationships between energy and poverty are not necessarily linear. They depend on a number of factors, including those related to the social and cultural milieu of the people, as well as their perceptions. Government policies also play a crucial role in determining the type of energy services that the poor could access. The complexities of the relationships can be understood and untwined through practical interactions with the poor. The present report is an attempt to examine the relationships between national energy policies and energy use among the poor and vulnerable in some selected urban and semi-urban slums of Nigeria. It uses the sustainable livelihood framework that has been well articulated by DFID.

Chapter two discusses the methodology of the study. In chapter three, the socio-economic characteristics of the four sampled communities are presented. The results of the tests of the research hypotheses are presented in chapter four. The main conclusions and recommendations of the study are presented in the last chapter of the report.

CHAPTER TWO: METHODOLOGY

2.1 Sustainable Livelihoods Framework

This project studies the energy consumption patterns of urban poor households in four selected communities in Nigeria. The objectives are to provide a holistic understanding of the role of energy in sustainable urban livelihoods, provide micro-level empirical evidence of the energy issues within urban households as well as form a basis for making policies that address these issues. Specifically, the study is intended to give insight into the poor urban livelihoods and the role which energy plays in sustaining them. It is based on the sustainable livelihoods framework which depicts livelihoods as being determined by the range of assets available to the household. These are basically of five types: human, financial, natural, physical and social.

Human capital represents the skills, knowledge, ability to labour and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives. Financial assets are financial resources that people use to achieve their livelihood objectives, including stocks (savings, convertible assets, including livestock) and flows of income. Natural resources are stocks from which resource flows and services useful for livelihoods are derived (e.g. lands, trees, water sources). On the other hand, physical capital comprises the basic infrastructure and producer goods needed to support livelihoods (e.g. buildings, roads/transport, water supply, and communications). Influencing the interactions among these assets are social resources upon which people draw in pursuit of their livelihood objectives, including networks, membership of formal and informal groups, and relationships of trust and reciprocity.

Two sets of factors external to the household but which exert a significant influence on their livelihoods, are “processes and structures” and the “vulnerability context”. Processes and structures include such factors as the legal environment, culture and institutions within society that affect the way the people can put their assets to use and also how they can accumulate assets. The vulnerability context refers to the ways that external shocks and trends affect asset levels. It could either be external (exposure to shocks or hazards) or internal (resilience or capacity to cope with or withstand shocks). In the Sustainable Livelihood framework, the emphasis is on the external aspect. These factors determine the livelihood strategies that people pursue, and ultimately their livelihood outcomes (including income levels and food security). Their interactions are depicted in Figure 2.1

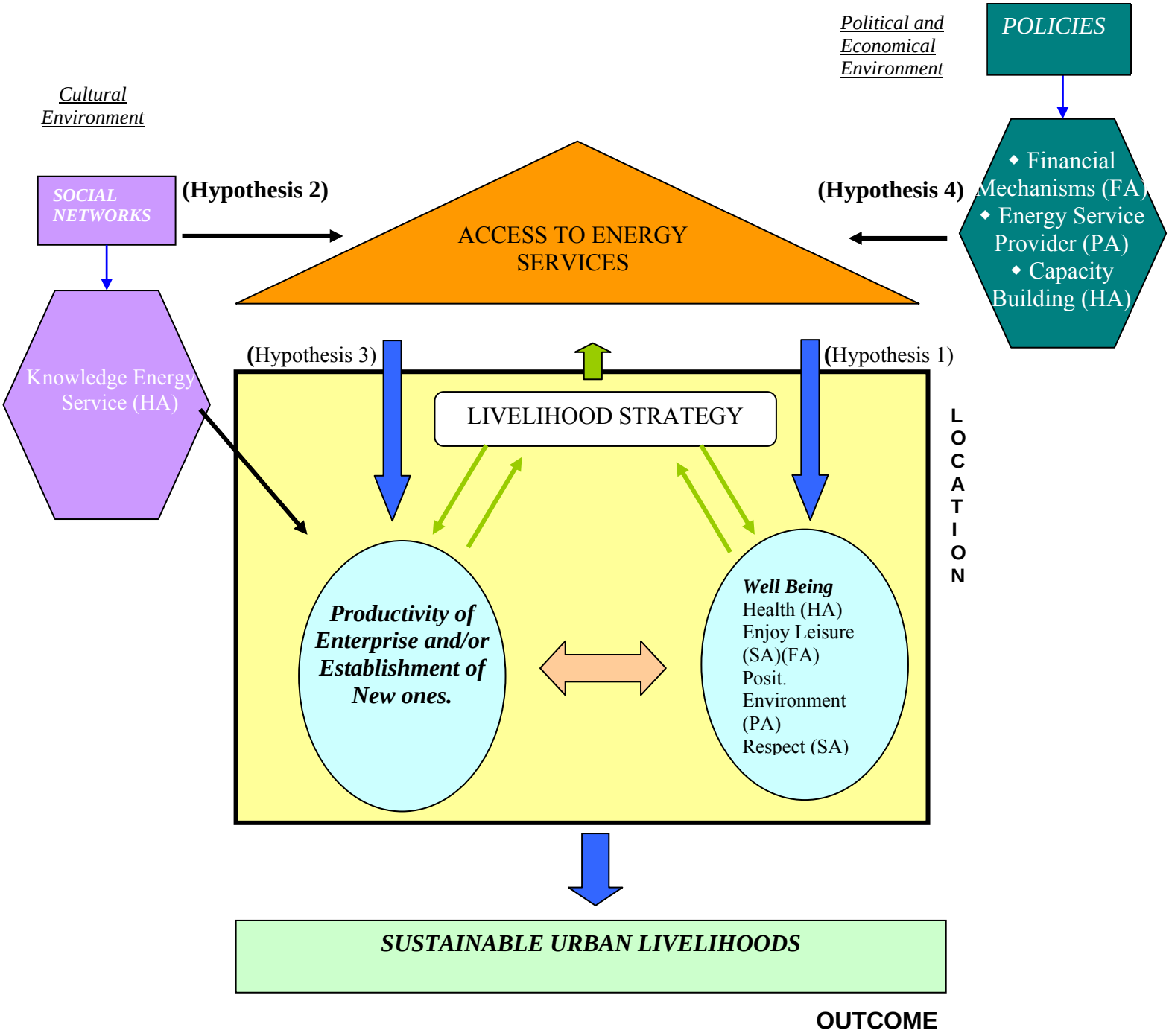


Figure 2.1: Sustainable Livelihoods Framework (DFID)

2.2 Research Hypotheses

The general data gathered during the implementation of this study will be used to test the validity of the following four hypotheses namely:

Hypothesis 1: Clean and affordable energy services are important for good physical well-being and productivity of household members.

It is generally assumed that poor people from rural areas migrate to cities for better livelihood opportunities. In particular, the urban poor compared to rural poor benefit more from increased access to modern forms of energy as they are nearer to the sources of supply. This increases their chances of moving out of poverty by reducing their energy budget and/or increasing their incomes through increased productivity. The validity of this assumption is tested in this study.

Hypothesis 2: Social networks and relationships facilitate access to energy services.

In view of the general notion that partnerships facilitate people's access to pooled resources, an aspect of the study focused on examining the relationship between social network and poor people's access to energy. The assumption is that networks and social relations are important determinant of individuals' access to resources and in particular access to knowledge and skills, funds, energy, conversion technology and information technical alternative. The role of associations such as cooperative and business associations in enhancing business access is, therefore, investigated in this study. Decision-making within the household about access and the use of energy services and technology is also explored in this study to determine the extent to which social networks and relationships have facilitated the poor people's access to energy services in the selected communities.

Hypothesis 3: Clean and affordable energy services are key factors in sustainability of livelihoods by increasing viability of existing enterprises and enabling establishment of new ones

Energy is one the most essential inputs into sustaining people's livelihoods. The urban poor are largely dependent on small-scale enterprises like fish smoking, food vending, etc.for income, all of which, one way or the other, depend on the availability of energy. These enterprises are thus vulnerable to shocks from energy price increases. The major energy shocks have been associated with the availability and prices of fuel. Women, as the main users of household energy, are particularly vulnerable to these shocks. Government commercialization and privatization policies can influence opportunities for poor people to become involve in energy services delivery. The hypothesis of the study in this regard is that there is a direct relationship between energy affordability and sustainability of the livelihoods of the poor.

Hypothesis 4: Energy sector reforms lead to improved access to clean and affordable energy services by enterprises.

Enabling policies, including energy sector reforms, can positively impact on small enterprises owned by poor people in urban areas, if it is transparent and well implemented. An important thrust of reform in the energy sector is commercialization and privatization which will make products more readily available to enterprises albeit at a higher price at least in the short run. Thus, the hypothesis is that pro-poor energy policies and reforms enhance the access of the poor to energy services.

For each hypothesis, a number of broad indicators have been formulated which will determine the data that need to be collected. These indicators are presented in Appendix II.

2.3 Data Collection Methodology and Analysis

The research approach adopted in the study entails the following steps:

- Literature review of energy policies (reported in Chapter 1);
- Adaptation of a globally prepared survey questionnaire to the Nigerian situation and its administration in the four communities using PRA techniques and Content Analysis; and
- Qualitative and quantitative analysis of collected data

2.3.1 Field Survey

Primary data

Research assistants and enumerators, under supervision by FOTE personnel collected data. The enumerators were undergraduates and fresh graduates from the universities and polytechnics. In Lagos, there were 12 enumerators with 8 supervisors while Abuja had 10 enumerators and 3 supervisors. The enumerators were trained in the principles of questionnaire administration and the need for validation of responses. Training methods included explanations, discussions, field trails etc. The training was for 2 days and it focused mainly on the administration of questionnaires and checklist to minimize interviewer's bias after which, they were evaluated on accuracy, efficiency and consistency to ensure standardized responses before they were allowed to commence the data collection.

Training of Enumerators and Research Assistants

A structured questionnaire that was globally prepared was analysed and adapted to the local conditions in Nigeria. The questionnaires were divided into different sections namely profile of respondents, profile of households and profile of enterprises, energy, well-being and productivity, social network, (Appendix I). The research team administered the questionnaire. Checklists and interviewer's guide were developed to facilitate the work of the researchers and obtain information from key informants (Community leaders, Energy Services providers and local government officials). Semi-structured interviewer's administered questionnaires were used to obtain information from the owners of the enterprises, their spouses and other household members. Transect walk around the four (4) communities and discussions with community groups were used to gather information on available resources, social networks that are related to energy services and flow of information.

The Research Team, comprising the FOTE research personnel and enumerators, were trained to take into consideration ethical issues and obtained permission from the various local government authorities and the community leaders. Objectives of the study were discussed with the leaders who offered full support and co-operation. To ensure confidentiality, no names were recorded on the questionnaire.

Field data were collected in October 2004 in both Lagos and Abuja simultaneously. This was facilitated by a sensitization visit to brief the various communities on the purpose of the survey and the potential

benefits to the enterprises/households in the communities. Prior to the administration of the questionnaire to all intended respondents, a pilot survey was carried out using sample size of 40; the main rationale behind the pilot was to test the reliability of the survey instrument and methodology planned for the actual survey. Based on the experience from the pilot survey, some modifications were made to the questionnaires to facilitate their administration.

Secondary data

Secondary data energy related documents at various policy making levels were reviewed. Some of the issues highlighted were energy sector reforms – deregulation, tariffs, pricing and available financial mechanism that facilitates access to cleaner energy such as subsidies, cheap loans and tax breaks.

Sample size

Data was collected through self-administered questionnaire from 4 poor urban communities in Lagos and Abuja (two communities were selected from each city). A total sample size of five hundred and ninety-eight (598) was covered instead of the planned six hundred (600) households/enterprises for the survey. To sample for representatives of energy users, focus was on fish harvesting/smoking and cassava processing in Lagos while pottery and akara (bean pastry) frying by street food vendors were the selected enterprises for Abuja. The study population has been selected using multi stage sampling design. Ilaje and Amukoko communities selected in Lagos while Kwali and Karmo communities in Abuja were selected for the study. Information was obtained from households and enterprises including their energy use, social network, well-being and productivity. Other information obtained included available resources in the community, using the Participatory Rural Appraisal (PRA) techniques.

Methods for data collection include the PRA techniques and Content Analysis. Checklists were developed in line with the Sustainable Livelihoods Framework and the indicators depending on the information required. The planned and actual households and Enterprises interviewed during the field survey are given in Table 2.1.

Table 2.1: Statistical distribution of sampled community household enterprises

Community	Households		Enterprises	
	Planned	**Actual**	**Planned**	**Actual**
Ilaje (Lagos State)	150	134	50	63
Amukoko (Lagos State)	150	120	50	35
Kwali (Abuja)	75	97	25	25
Karmo (Abuja)	75	100	25	24
Total	450	451	150	147

2.3.2 Data Analysis

Data collected (Qualitative and quantitative) were analyzed with the Statistical Package for Social Sciences (SPSS) and QSR Software. Analytical tools for this study are the Gender Analysis Matrix and the Sustainable Livelihoods Framework (SLF). Comparisons were made between the two urban cities and among the 4 communities using the relevant statistical analysis to establish the differences among the study population.

Data cleaning and editing were done manually and by computer to eliminate errors. Quantitative data was analyzed using the Statistical Package for Social Sciences (SPSS) and the qualitative data were analyzed with the QSR. The gender analytical tools and sustainable livelihoods framework were used to disaggregate and organize the data.

Results of the study are reported in matrices (health, gender and energy), diagrams (Venn, pie charts etc.), and maps (resource, social).

CHAPTER THREE: SOCIO-ECONOMIC PROFILES OF THE COMMUNITIES

Four communities were chosen for our survey. Two of the communities (Ilaje and Amukoko) were chosen from Lagos, the former capital of Nigeria and the largest urban centre in the country with a population of about 15 million people. Lagos is an old city with a high level of poverty, unemployment and social inequalities. Most of the poor areas are densely populated and lack most basic infrastructure and facilities. The capital of Nigeria was moved to Abuja in 1992. It is thus a new and growing urban centre with new settlements. The metropolitan area is well planned, but numerous satellite towns are springing up rapidly around the business and residential districts without any planning, thus developing into slums. These satellite towns are inhabited mainly by the poor and newly arrived migrants. The following is a summary of the socio-economic characteristics of the four communities that were studied.

3.1 The Ilaje Community – Lagos State

Ilaje community is an urban poor community in the Bariga Local Government Area of Lagos State. It is located by the Lagos lagoon and the soil type is muddy clay. It has an estimated population of about 25,000 persons spread into about 250 households with an average household size of 10 persons. The community is ethnically mixed, comprising Edo, Yoruba, Efik/Ibibio and Ibo, as well as some migrant Egun settlers from the Republic of Benin. The community is dominated by Christians and currently has about 15 churches.

The Ilaje community is dominated by male headed households, with female headed households constituting only 24 percent of the population (Table 3. 1 and Fig. 3.1). The population dynamics indicate that about 41 percent are youths within the age range of 25 – 44 years (Table 3.2 and Figure 3.2). About 72 percent of the people are married (Table 3.3 and Figure 3.3), with majority (43%) as traders (Table 3.4 and Figure 3.4) and 17 percent as civil servants. About 20.8% of the people have no formal education (Table 3.5 and Figure 3.5). Most of the people are Christians (66%) with Yoruba as the dominating language (Tables 3.6 and 3.7 and Figures 3.6 and 3.7 respectively). The mean household size is 4.2.

The men are predominantly fishermen while women are fish smokers and traders, although some process cassava into “fufu”. The community makes purchases from the nearby Asogbon market. The major access road which is St. Finbarrs Road leads from the Third Mainland Bridge to the University of Lagos. This

road is fairly good but occasional traffic hold-ups occur along the way due to the location of markets along the route. The Bariga Road, which branches off from St. Finbarrs Road towards the community, is tarred but it is inundated with potholes. Roads in the community are mainly earth road and during the wet season, the environment is flooded due to poor and blocked drainage systems. The community has two non-formal schools that are supported by UNICEF and one Primary Health Care Centre owned and managed by the Local Government Authorities. It provides antenatal, paediatrics services and treats minor ailments for the residents. At present, the traditional stool in Ilaje is vacant, but the Community Development Association (CDA), is very effective and provides political leadership in the community.

The main sources of water supply in the community are boreholes and from water vendors. The human resources available in the community include skilled and unskilled manpower. There are abundant sea resources like fish, shrimp and prawn. These fishery resources are surprisingly not cheap, as they are seen as products targeted by the rich who come to buy them through middle men. Poverty is therefore still the norm in this community with poor sanitation and infrastructure, like many unplanned areas of Lagos. Electricity supply is not stable and the people depend on other sources of energy for cooking and lighting. Kerosene is the main energy sources for cooking and lighting, while fuel wood is used for fish smoking. Petrol and diesel are used for powering fishing boat engines. Means of communication in the community is through circulars issued from the office of the Community Development Association. Radio also constitutes a main source of information in the Ilaje community.

3.2 The Amukoko Community – Lagos State

Amukoko community is one of the five low-income communities that make up the Ifelodun Local Government Area of Lagos State with a total population of 120,000. The others are the Alade, Ibaleye, Layene and the Oridilu communities. Amukoko is the largest with a land area of about 41 hectares and a population of about 50,000 people. It has a tribal mixture of Yoruba, Ibos, Ijaws, Hausas and some minority elements. The religious affiliation of the people is shared between Islam and Christianity but there are some traditional religious practitioners.

The Amukoko community is dominated by male headed households, with female headed households constituting only 22 percent of the population (Table 3. 1 and Fig. 3.1). The population dynamics indicate that about 33 percent are youths within the age range of 25 – 44 years (Table 3.2 and Figure 3.2). About 81 percent of the people sampled are married (Table 3.3 and Figure 3.3), with traders constituting 26

percent of the population (Table 3.4 and Figure 3.4) and 15 percent as civil servants. About 9% of the people have no formal education (Table 3.5 and Figure 3.5). Most of the people are Christians (72%) with Yoruba as the dominating language (Tables 3.6 and 3.7 and Figures 3.6 and 3.7 respectively).

The community has 8 markets, 5 primary schools, 2 secondary schools, and 11 private schools. There are two Primary Health Centres that attend to the health needs of the community. The major occupation for both men and women is trading, although some are engaged in white-collar jobs. Potable water is, however, scarce. Residents depend on boreholes, wells and water vendors for their water needs.

The available energy forms for cooking are ranked as kerosene, charcoal, fuel wood, electricity and LPG. There are three fuel stations selling mainly petrol. Kerosene vendors and wood dealers are usually small-scaled operators. Fuel wood is brought in from Epe in Lagos State and from the neighbouring Ogun State. Interestingly, the increasing cost of kerosene has not resulted in increased demand for fuel wood as would be expected. This is because the cost of fuel wood is also high, despite its inefficiency as a source of energy. Moreover, food vendors who depend on fuel wood for cooking have reduced their output due to their reducing purchasing power. Most households in the community are connected to the electricity grid, but supply is poor and erratic. Thus more and more people in the community depend on generators for electricity. However, because of the generally low income status of the community members, only about 10 percent of them could afford to purchase generators.

3.3 The Kwali Community – Abuja

Kwali has a population of about 80,000 and is located in the Kwali Area Council along the Abuja Lokoja Road. It is about 25 kilometers from Gwagwalada, a bigger urban settlement. Kwali is a linear and dispersed flat grassland settlement with a gentle slope to a river. The community has a central head called Sarki and district heads called Mai Angwuas for the different districts. Their role in the community is mainly advisory as the executive authority lies with the Local Area Council.

The Kwali community is dominated by male headed households, with women constituting about 37 percent of the population (Table 3. 1 and Fig. 3.1). The population dynamics indicate that about 67 percent are youths within the age range of 25 – 44 years (Table 3.2 and Figure 3.2). About 76 percent of the people are married (Table 3.3 and Figure 3.3), with 38 percent as traders (Table 3.4 and Figure 3.4) and 29 percent as civil servants. The major occupation of the men is farming while for the women it is

pot making, farming and fuel wood business. About 12.6% of the people have no formal education (Table 3.5 and Figure 3.5), and about half of the population are Christians and about 47 percent of Islamic faith. The major ethnic groups in the community are Gwari, Hausa and Yoruba.

There are 3 primary and 4 secondary schools with numerous informal schools in the community. The major health problem in the community is Malaria and the health care system is comprises of one general hospital, 2 rural clinics, 7 midwife homes and 5 Herbal homes. Only the General hospital is owned by the government while the rest are privately owned.

Although the community is connected to the national grid, the supply of electricity is very erratic, and the cost very high, often beyond the purchasing power of many residents. Fuel wood and kerosene, therefore, constitute the main sources of energy for cooking and lighting for the community members.

3.4 The Karmo Community – Abuja

Karmo has a population of about 101,000 and is located in the Abuja Area Council along the Abuja-Gwagwa-Suleja Road. It is about 5 kilometres from the Abuja city centre. Karmo is a dispersed flat grassland settlement with a valley leading to a river. The community has a central head called Sarki and district heads called Mai An
gwuas for the different districts. Their role in the community is mainly advisory as the executive authority lies with the Local Area Council.

Like in the other sampled communities, domination of male headed households is paramount feature of existence in the Karmo community. About 82 percent of the households sampled are male headed (Table 3.1 and Figure 3.1). The community is extremely youthful with about 81 per cent of the people between the ages of 25 and 44 (Table 3.2 and Figure 3.2). Despite their youthfulness, most (80%) are married (Table 3.3 and Figure 3.3). Trading and civil service employment constitute the main occupation of the community members (Table 3.4 and Figure 3.4), and unlike the other communities, the people are largely literate with over 71 percent of the people having completed secondary education or higher (Table 3.5 (Appendix III) and Figure 3.5). It is therefore not surprising that the major occupation of the men is white-collar job. Men also engage in farming and trading while the women participate in trading and in the frying of the traditional bean cakes (akara). The major ethnic groups in the community are Yoruba

and Ibos, who are settlers, while the indigenes are Gwari. Their religious affiliations are Islam and Christianity with some animists and so far they all coexist peacefully.

There are 7 primary and 5 secondary schools with numerous informal schools in the community. The major health problems in the community are Malaria and Tuberculoses and the health care system is comprises of one general hospital, 2 Maternity homes, 5 rural clinics, 8 midwife homes and 4 Herbal homes. Only the General hospital is owned by the government while the rest are privately owned.

Similar to the other three communities, electricity supply is erratic and costly. A few of the community members use LPG. Thus fuel wood and kerosene constitute the main sources of energy for cooking, lighting and entrepreneurship development.

Table 3.1: Gender statistics of the head of household of the sampled communities.

Gender	Name of Sampled Community				Total
	Ilaje	Amukoko	Kwali	Karmo	
Male	100	84	61	82	327
Female	32	24	36	18	110
Total	132	108	97	100	437

Figure 3.1: Gender statistics of the head of household of the sampled communities

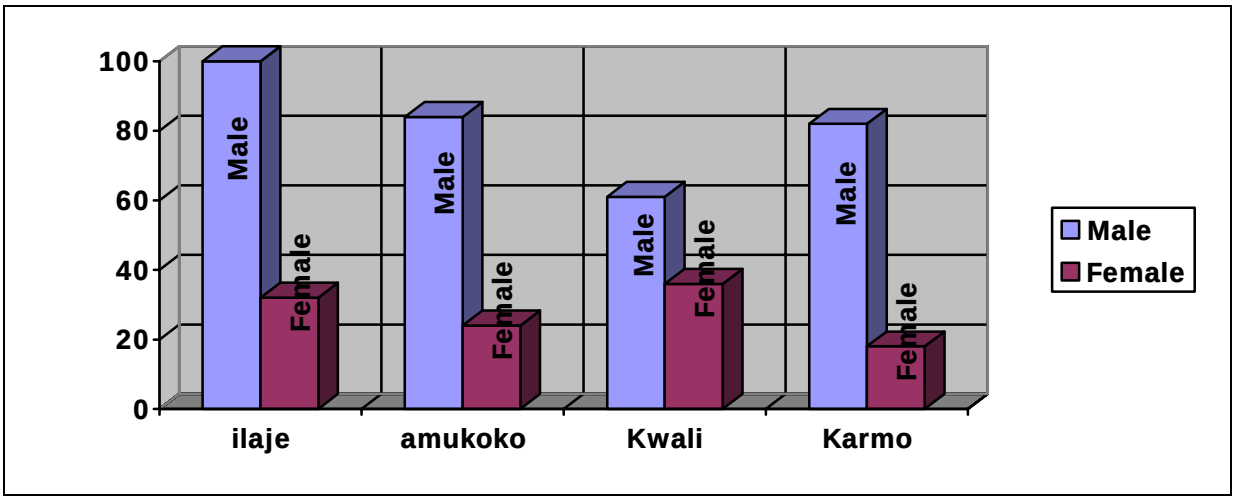


Table 3.2: Marital status of the Head of households sampled

MARITAL STATUS	Name of Community				Total
	Ilaje	Amukoko	Kwali	Karmo	
Married	92	88	72	80	332
Divorced	2	1	1	3	7
Separated	2	1	0	3	6
Widow	20	11	3	1	35
Single	11	8	19	12	50
Total	127	109	95	99	430

Table 3.3: Occupation status of Head of Household

OCCUPATION	Name of Community				Total
	Ilaje	Amukoko	Kwali	Karmo	
Trader	54	29	37	32	152
Transporters	7	10	5	7	29
Student	4	2	8	3	17
Fish smoker	3	8	1	0	12
Cassava processor	3	1	0	1	5
Civil Servant	22	16	28	36	102
Other	34	44	18	20	116
Total	127	110	97	99	433

Table 3.4: Educational status of Heads of households sampled

LEVEL OF EDUCATION	Name of Community				Total
	Ilaje	Amukoko	Kwali	Karmo	
None	27	10	12	3	52
Attended primary school	23	19	9	3	54
Completed primary school	15	22	18	8	63
Attended secondary school	10	14	9	8	41
Completed secondary school	30	24	18	46	118
Attended higher institution	7	6	21	7	41
Completed higher institution	17	17	7	25	66
Other	1	0	1	0	2
Total	130	112	95	100	437

Table 3.5: Religious affiliations of Heads of households sampled

RELIGION	Name of Community				Total
	Ilaje	Amukoko	Kwali	Karmo	
Islam	43	31	46	38	158
Christianity	88	83	49	62	282
Traditional	1	0	2	0	3
Other	1	1	0	0	2
Total	133	115	97	100	445

Table 3.6: Tribe of Heads of households sampled

LANGUAGE	Name of Community				Total
	Ilaje	Amukoko	Kwali	Karmo	
Yoruba	87	49	13	20	169
Hausa	2	4	22	11	39
Igbo	20	31	9	30	90
Egun	6	2	0	0	8
Gbagyi	0	0	22	9	31
Efik/Ibibio	10	2	2	0	14
Gwari	0	0	13	6	19
Other	7	27	16	24	74
Total	132	115	97	100	444

Table 3.7: Nationalities of Heads of households sampled

NATIONALITY	Name of Community				Total
	Ilaje	Amukoko	Kwali	Karmo	
Nigerian	131	114	97	97	439
Non Nigerian (West African)	1	0	0	2	3
Non Nigerian (Rest of Africa)	0	0	0	1	1
Total	132	114	97	100	443

Gender statistics of the heads of households

From the tables above, the domination of male headed households over female can be attributed to the cultural practices in these communities where widows are inherited by older members of the husbands' family. It is therefore, common for most households to have a male head even if the woman, a widow, is responsible for the family's upkeep. The inheritance is usually to remove the social stigma attached to women living alone.

From table 3.3 above, majority of the heads of households in the four communities (35%) are traders, 27% are civil servants while 3.4% are fish smokers and cassava processors.

The level of education and gender of heads of households may account for the low participation of men in fish smoking and cassava processing enterprises which are seen as women enterprises..

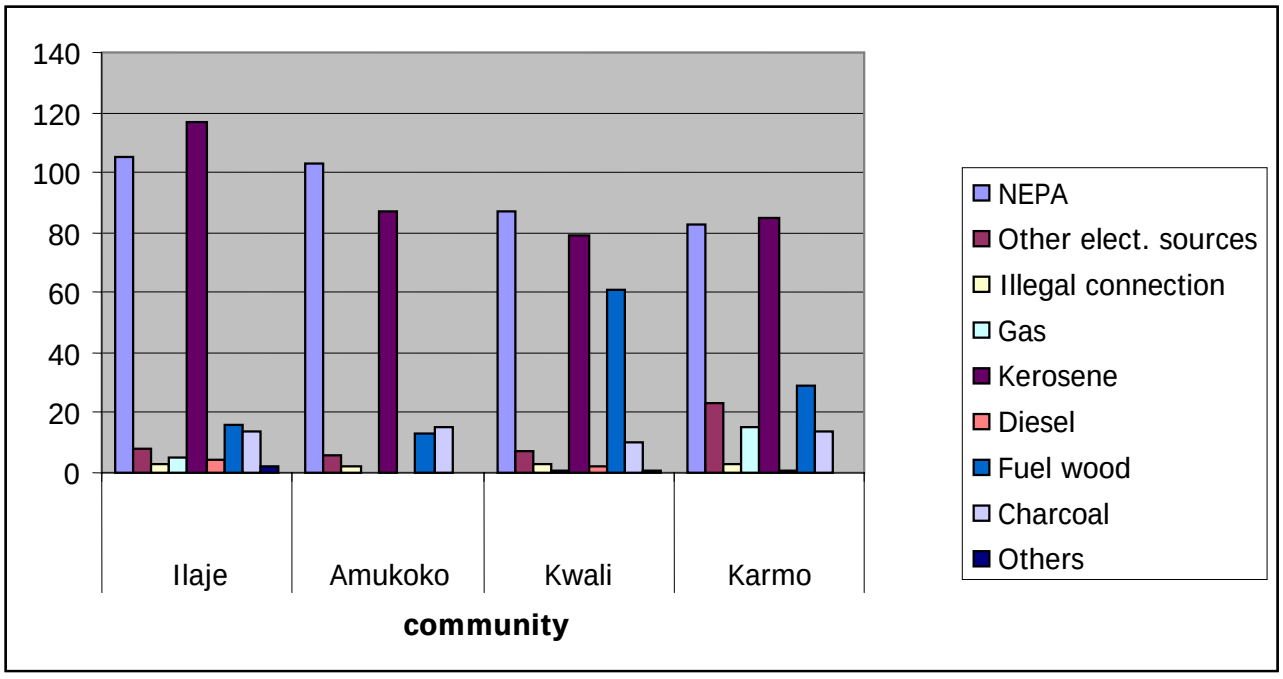
CHAPTER FOUR: FINDINGS

4.1 Elements of Energy and Households Well-being (Hypothesis 1)

4.1.1 Main forms of energy used in households

Six forms of energy services are mainly used in the households in the four communities. These are electricity, kerosene, LPG, diesel, fuel wood and charcoal. About 83.3 percent of the respondents use electricity mainly for lighting purposes, while kerosene is used by 81.6 percent for cooking. Fuel wood use accounted for 26.4 percent. Some respondents use charcoal, gas and diesel respectively. Our finding is that electricity is still the preferred energy service used for lighting purposes, while kerosene is mostly used for cooking. Fuel wood use in Lagos is limited because of difficulties in obtaining it and lack of storage spaces for it in the poor urban areas with high density housing as shown below (Figure 4.1) and Table A1.1 (Appendix III).

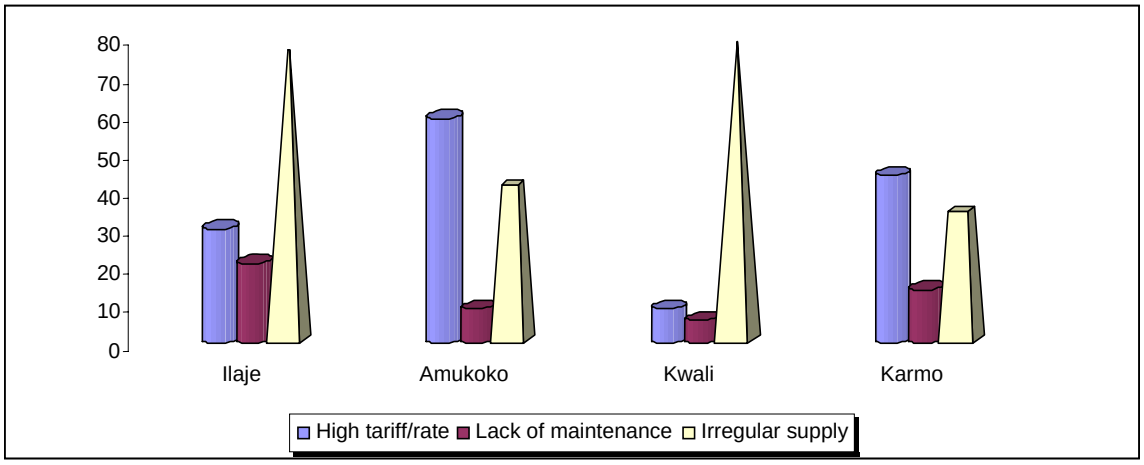
Figure 4.1: Forms of energy used by Households



4.1.2 Major problems with electricity

While electricity is the preferred form of energy use among the households, respondents expressed a lot of frustration with its usage. Erratic supply and high tariff are the two main constraints mentioned by respondents as shown below (Figure 4.2, Table A1.2). About 54.4 percent of the households listed irregular supply as the main problem, while 33.7 percent reported high tariff as the major problem associated with electricity usage in their communities. In particular, the Ilaje and Kwali communities listed irregular supply as their major constraint while the settlements of Amukoko and Karmo listed high tariff as their major constraint.

Figure 4.2: Main constraints to use of electricity in the communities

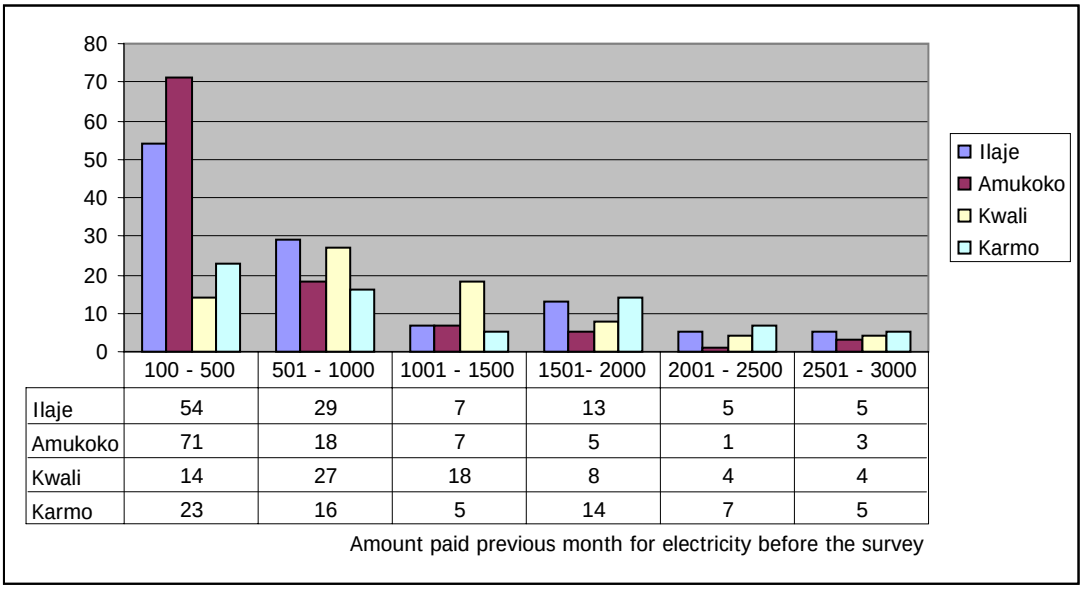


4.1.3 Cost of electricity

Despite the irregular supply, community members still have to settle high bills on monthly basis. This is because the National Electric Power Authority (NEPA) usually generates bills based on estimated rates than actual power consumption. Therefore, even though electricity supply may be erratic and consumers try to conserve energy by turning off their appliances when not in use, their bill stays the same. From our survey of 363 respondents, a majority (44.6%) of respondents pay between N100 – N500 per month, while 24.8 % pay between N501 – N1, 000 per month and about 10.3 percent of respondents pay as much as between N2, 000 – N3, 000 per month. The latter range of payment is considered high for low-income earners, particularly those that reside in Ilaje and Amukoko (Figure 4.3). It should be remembered that electricity is used mainly for only lighting.

There is no correlation between household size and the amount paid by respondents. This is because each tenement building is billed in bulk (shared electricity meter). The bills for each month are shared amongst the tenants based on the number and size of appliances owned by them. Therefore, the household size does not necessarily have an impact on the electricity consumption but the number of appliances owned by that household. Hence, most people in the four communities pay less as shown in fig 4.3 below and table A1.3 as a result of the high number of the predominant low income earners in the four communities. The more appliances (electricity) used, the higher the bill.

Fig 4.3: Cost of electricity among the communities (Naira)

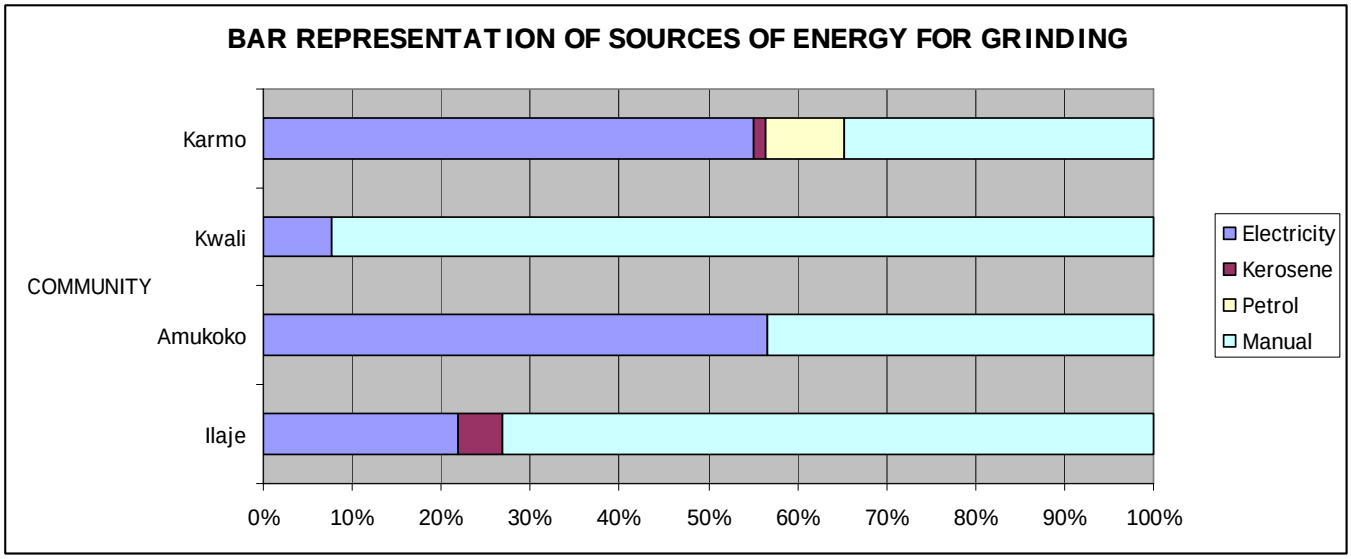


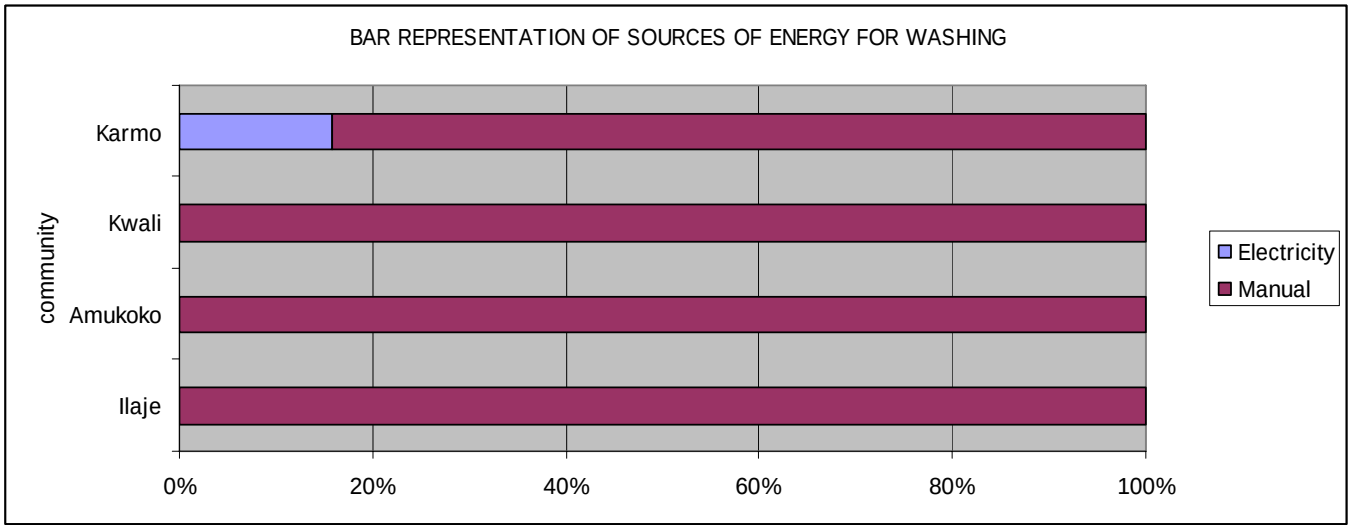
	100 - 500	501 - 1000	1001 - 1500	1501- 2000	2001 - 2500	2501 - 3000
Ilaje	54	29	7	13	5	5
Amukoko	71	18	7	5	1	3
Kwali	14	27	18	8	4	4
Karmo	23	16	5	14	7	5

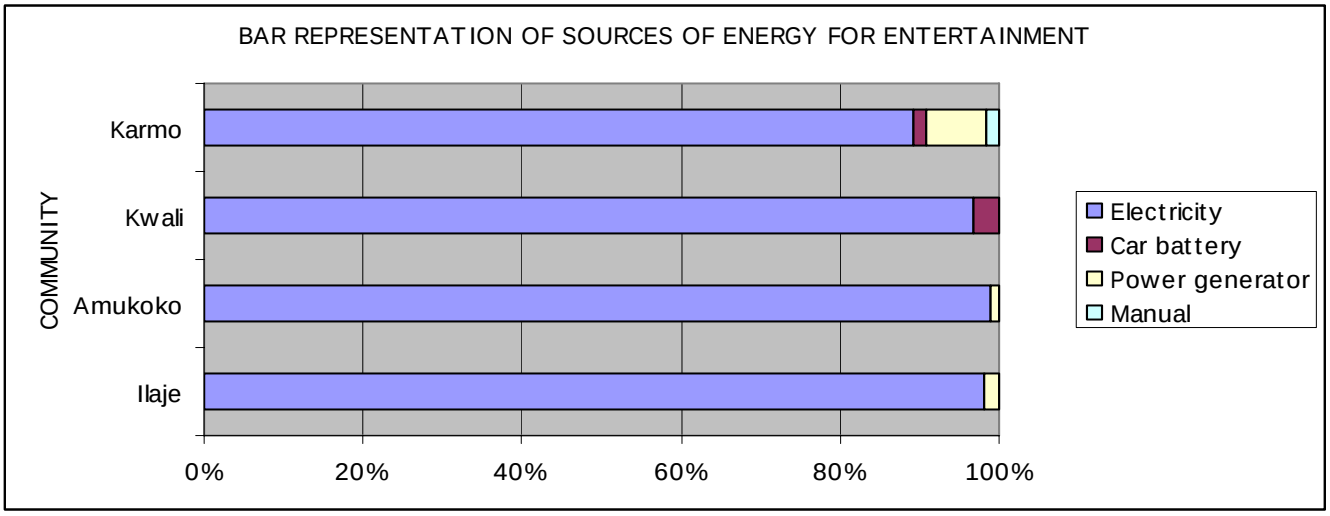
Amount paid previous month for electricity before the survey

4.1.4 Main sources of energy for end-use

The major end-uses of energy in the communities are grinding, washing and entertainment. The major source of energy used for grinding indicated that manual energy was mostly used in Ilaje and Kwali while electricity was used mostly in Amukoko and Karmo. In general, manual energy is commonly and frequently used for grinding (Figure 4.4a, Table A1.4a). Manual energy is also used for washing (Figure 4.4b, Table A1.4b) in the four communities. For entertainment, electricity from NEPA is the major source of energy (Figure 4.4c, Table A1.4b) followed by electricity derived from petrol generator sets owned by each household, while batteries are seldom used.


BAR REPRESENTATION OF SOURCES OF ENERGY FOR GRINDING
Karmo
Kwali
Amukoko
Ilaje
COMMUNITY
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Electricity
Kerosene
Petrol
Manual


BAR REPRESENTATION OF SOURCES OF ENERGY FOR WASHING
Karmo
Kwali
Amukoko
Ilaje
community
0%
20%
40%
60%
80%
100%
Electricity
Manual


BAR REPRESENTATION OF SOURCES OF ENERGY FOR ENTERTAINMENT
Karmo
Kwali
Amukoko
Ilaje
COMMUNITY
0%
20%
40%
60%
80%
100%
Electricity
Car battery
Power generator
Manual

4.1.5 Energy technology used for household activities

The analysis carried out on various energy technologies used for household activities showed that electric bulbs are mainly used for lighting in all the four communities (Figure 4.5a) while kerosene stoves are used for cooking, heating and boiling drinking water (Figures 4.5b &c)

Figure 4.5a Energy technology used for Lighting

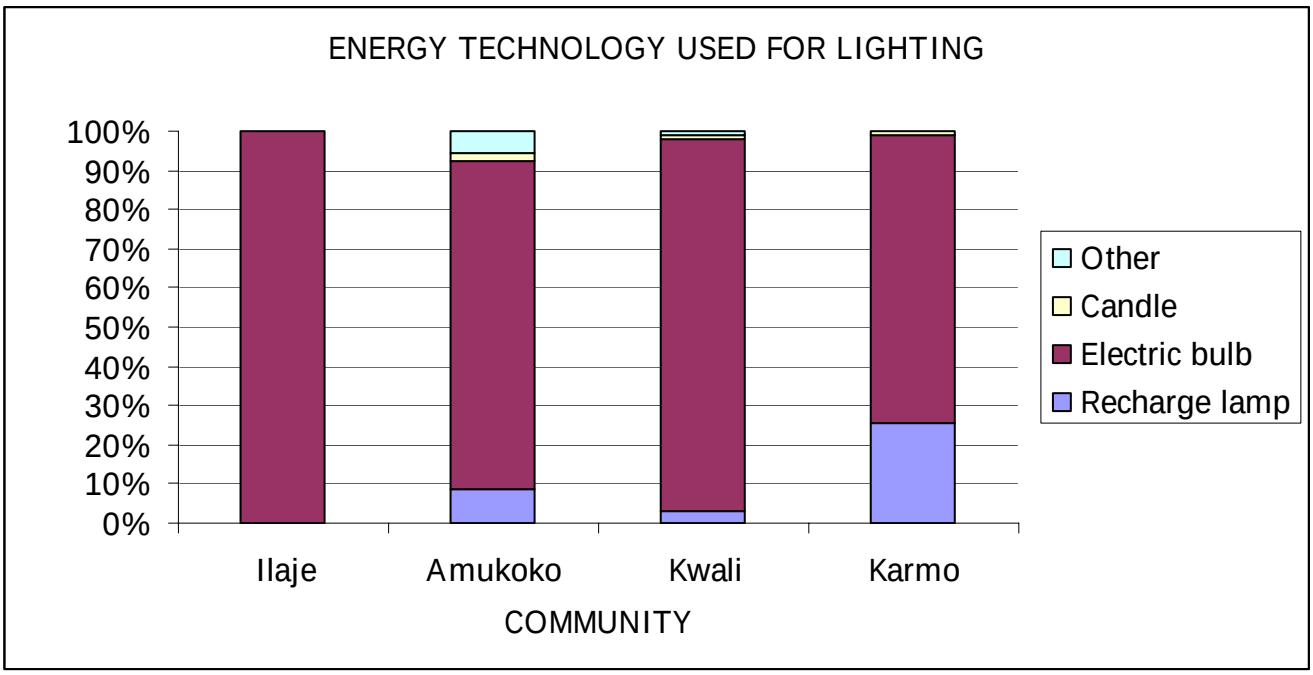


Figure 4.5b Energy technology used for cooking

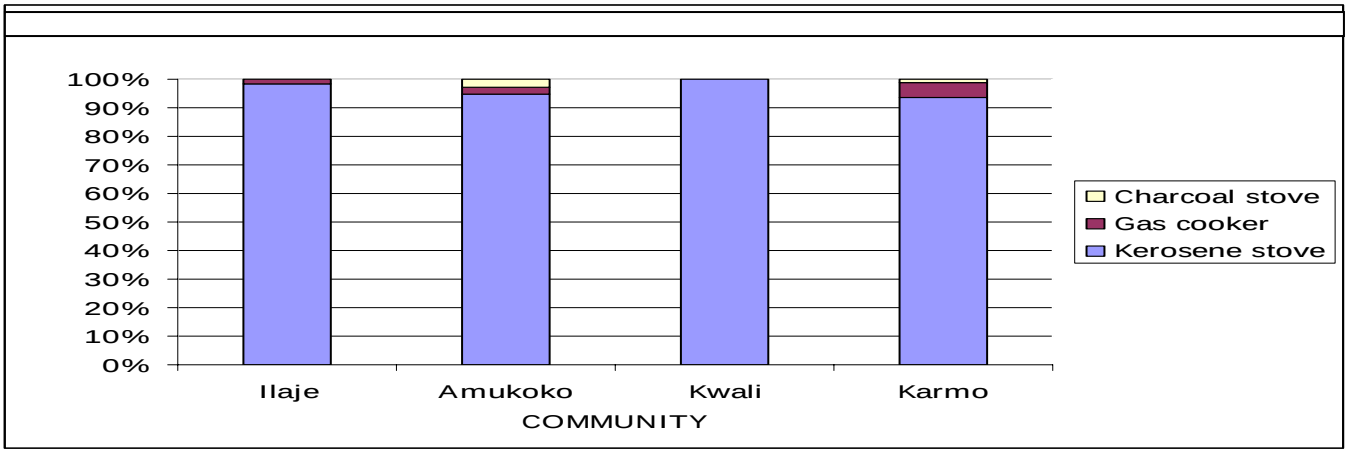
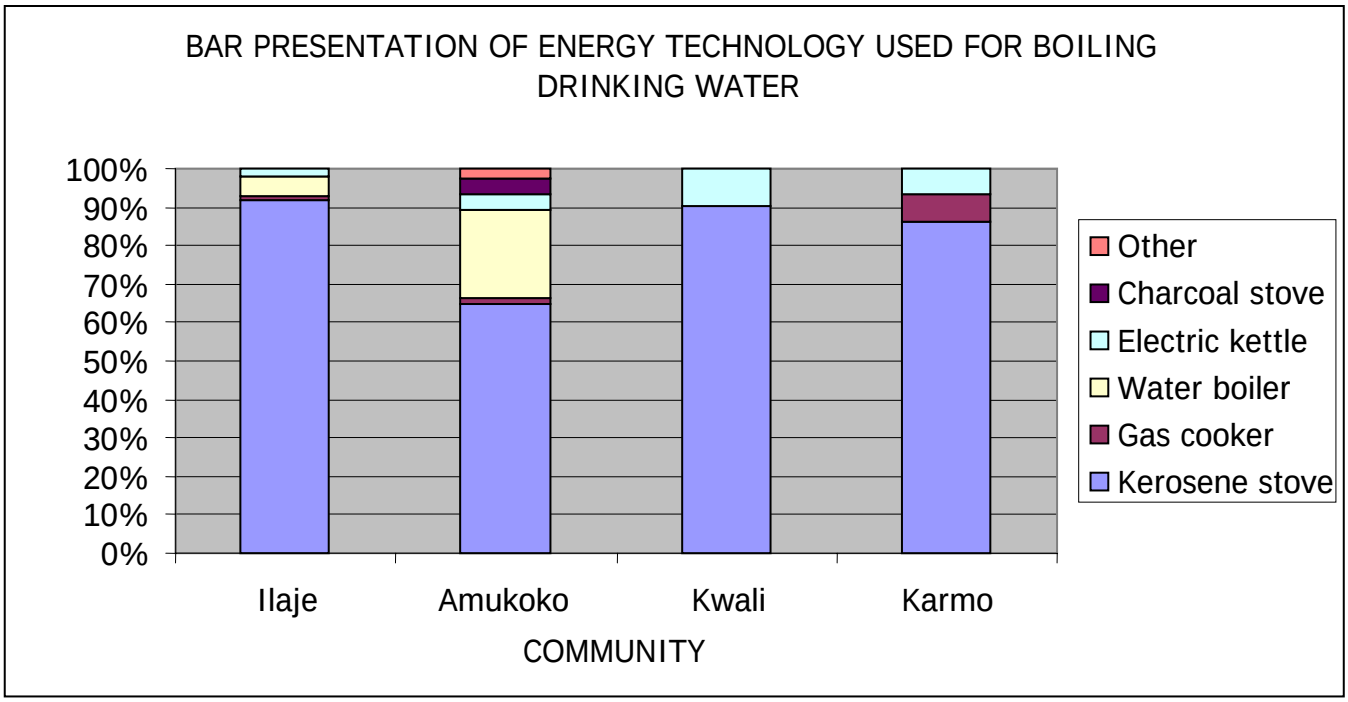


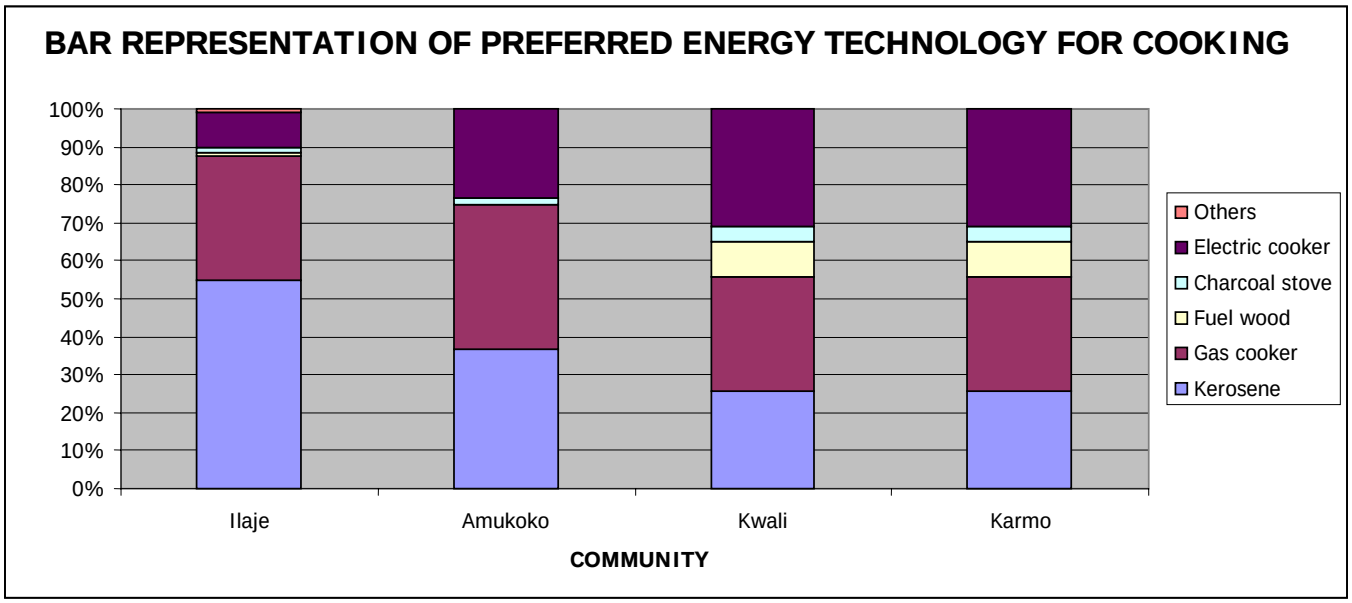
Figure 4.5c Energy technology used for boiling drinking water



4.1.6 Preferred energy technology

About 95.0 percent of the 445 respondents in the communities expressed their preference for cooking with cleaner burning appliances like kerosene, gas and electric cookers while only 5 percent expressed preferences for fuel wood and charcoal. Fuel wood is widely used in some communities in Abuja as wood ownership bestows a wealthy status on the owner (Figure 4.6). During the survey, it was found that the women usually accumulate fire wood by reserving some each time they cook for their children to inherit. The daughters inherit the accumulated fire wood after the demise of their mothers and the more the quantity of fire wood inherited the higher the status accorded the individual in the community.

Figure 4.6 Preferred energy technologies

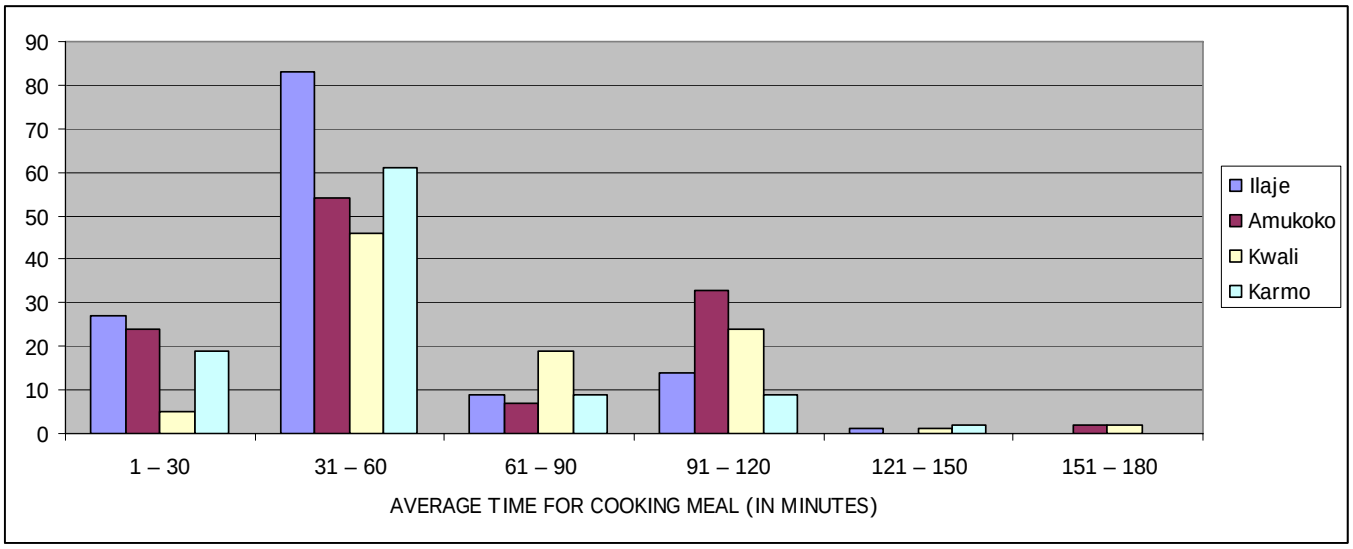


4.1.7 Average time for cooking meals

The length of time taken to cook a meal could be a measure of the drudgery involved in cooking with inefficient fuels. Cooking time's savings could be achieved by the introduction of more efficient fuels.

In the communities studied, time taken to cook a meal range from 1-30 minutes to 151-180 minutes. Majority of respondents (54%) reported averages cooking times of between 31-60 minutes, while about 16.6 percent reported average times of 1-30 minutes (Figure 4.7, Table A1.7) for light meals which are all they have a day.

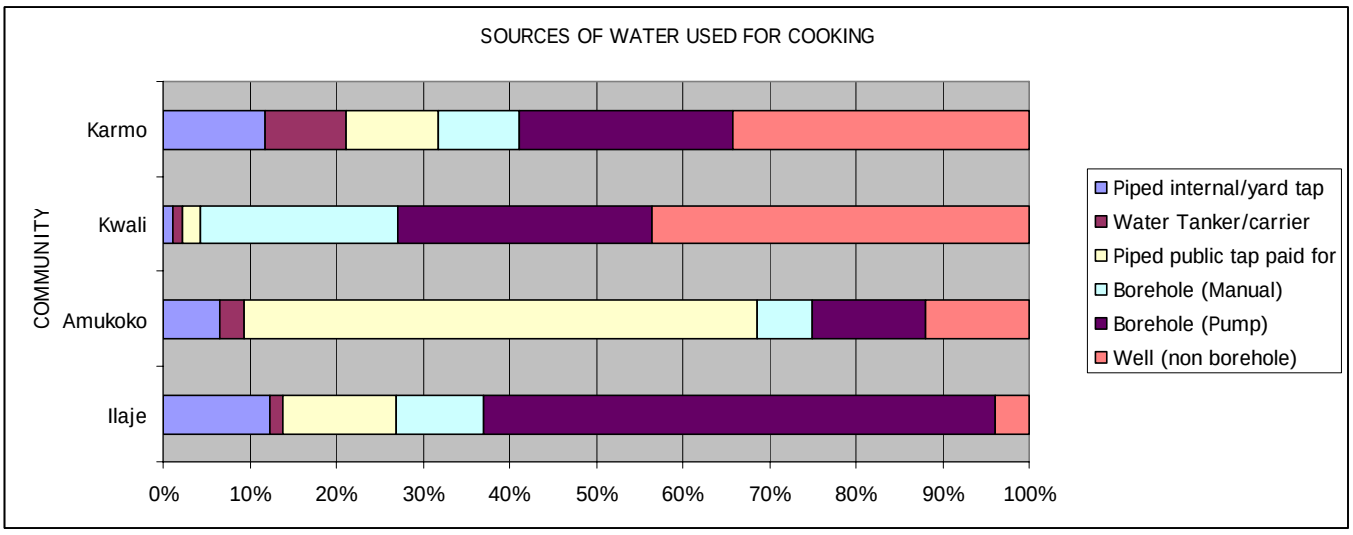
Figure 4.7 Average time for cooking meals



4.1.8 Sources of water use

The major sources of water used for cooking, washing, and drinking in the communities are pipe-borne water taps, tanks/carriers, borehole, and rain water (Figures 4.8a&b). The quality of most of these water sources cannot be assured. Poor water quality is the result of the sources of supply which include untreated water from boreholes and water vendors.

Figure 4.8a Major source of water used for cooking



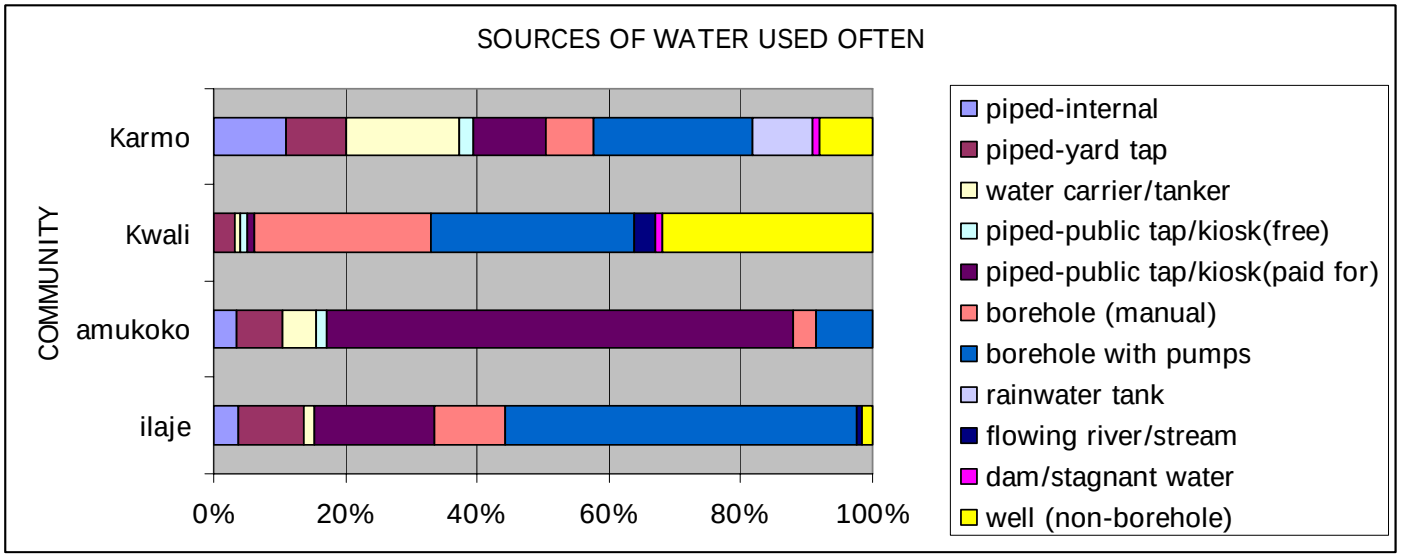
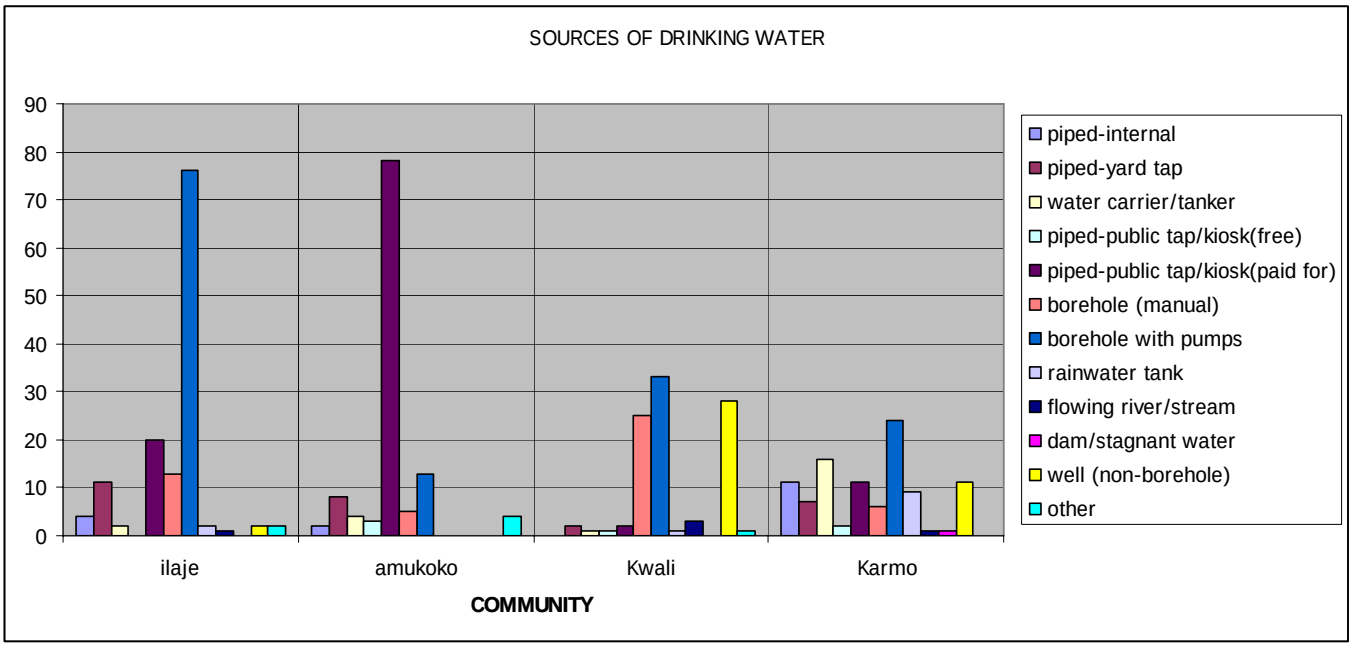


Figure 4.8b Major source of water used for drinking

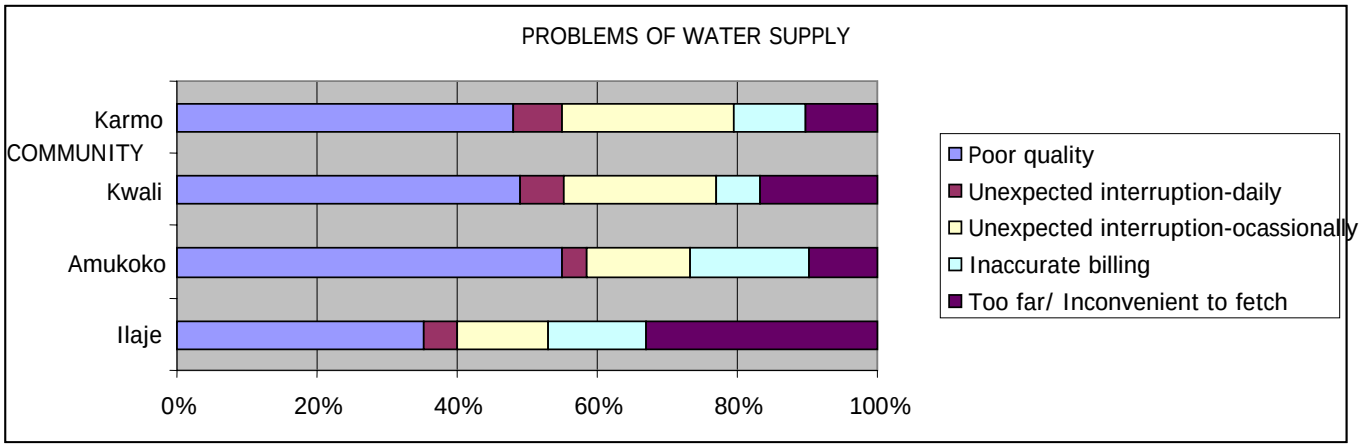


4.1.9 Problems encountered with water supply

The problems encountered with water supply in these communities include poor quality water, unexpected interruption, (daily/occasionally), inaccurate bills, and far/inconvenient location of water

point. About 46.8 percent of the respondents indicated that poor quality of water was their major problem. Unexpected interruptions (daily/occasionally) were identified as the major problem by 24.4 percent (Figure 4.9). This implies that respondents may not mind disruptions in water supply so far the quality of water is good.

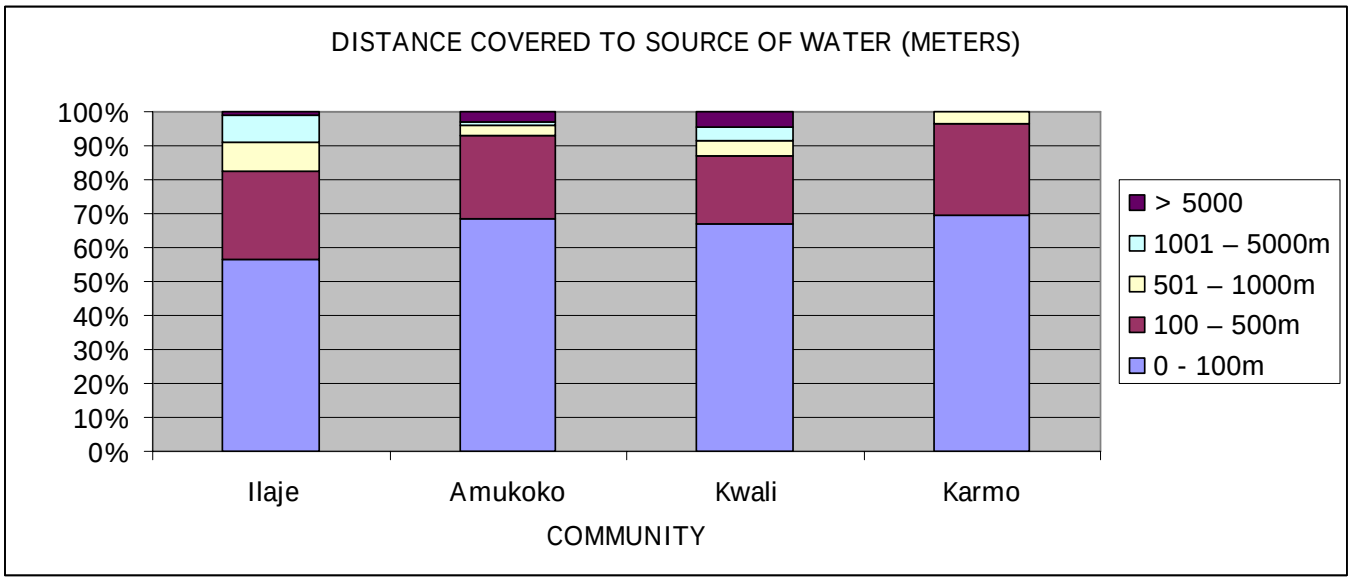
Figure 4.9 Problems of water supply among the communities



4.1.10 Distance from water point

Water point distance is not a major problem in the communities. 263 respondents out of 406 (64 percent) reported that the distance from their water source is less than 100 meters (Figure 4.10).

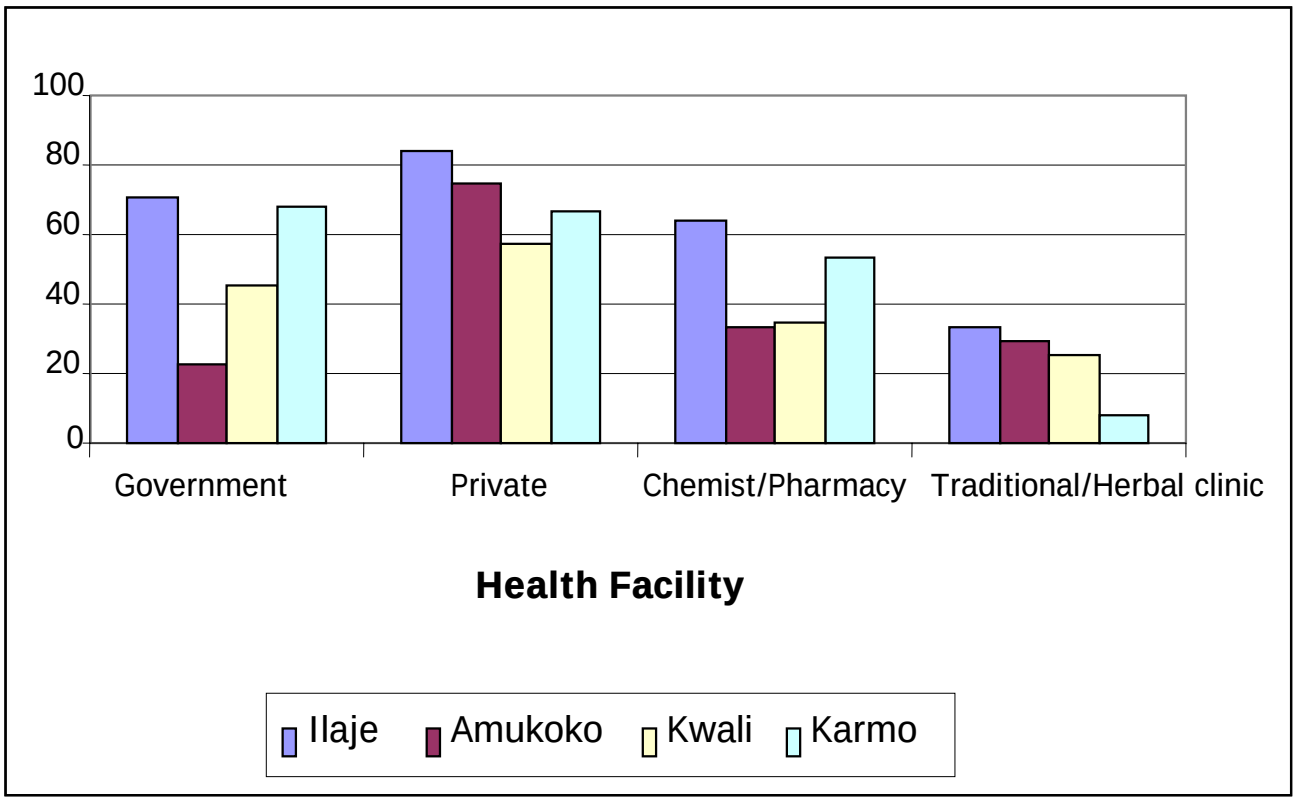
Figure 4.10 Distance covered to source water



4.1.11 Patronage of health facilities

Health facilities in the four communities include governmental hospitals, private hospitals, Pharmacy/Chemists, Traditional Herbal Clinics. Private hospitals are the most patronized in all the communities with level of patronage of about 63 percent of the respondents surveyed while that of government health institutions was 46 percent. Private hospitals attract the most patronage even while more expensive due to better facilities and services available there. Pharmacists and chemists also provide some health care delivery services as reported with level of patronage of 39 percent. Traditional healers still have a place in health care delivery in these communities (Figure 4.11)

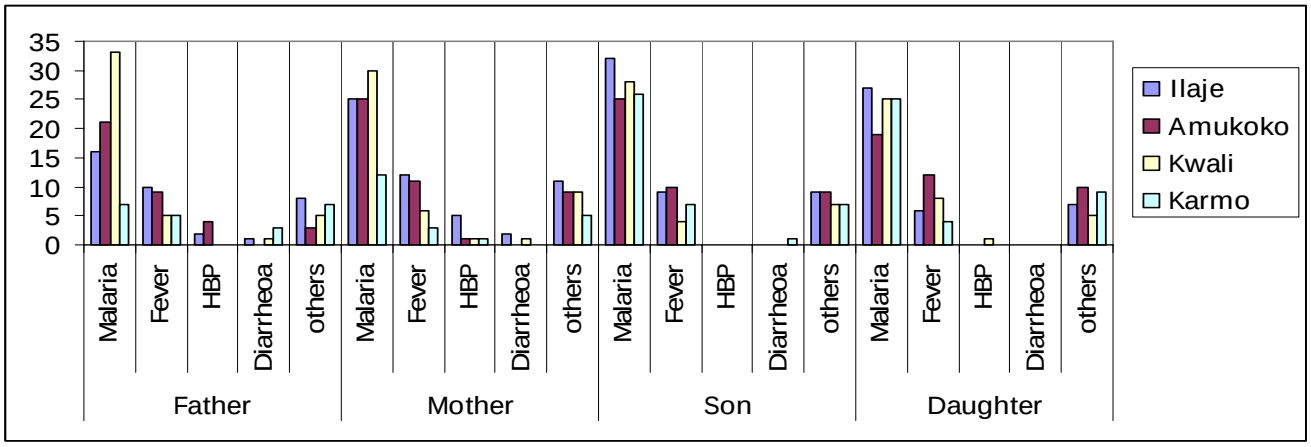
Figure 4.11 Use of health facilities by communities



4.1.12 Major health problems faced by household members

The study revealed the most prevalent health problem faced by the respondents was malaria which constituted more than 50 percent of diseases reported by the communities. Irrespective of the economic status of the household members, malaria fever was widely acclaimed as the major health problem faced by the communities (figure 4.12).

Figure 4.12 Frequently reported diseases among the communities



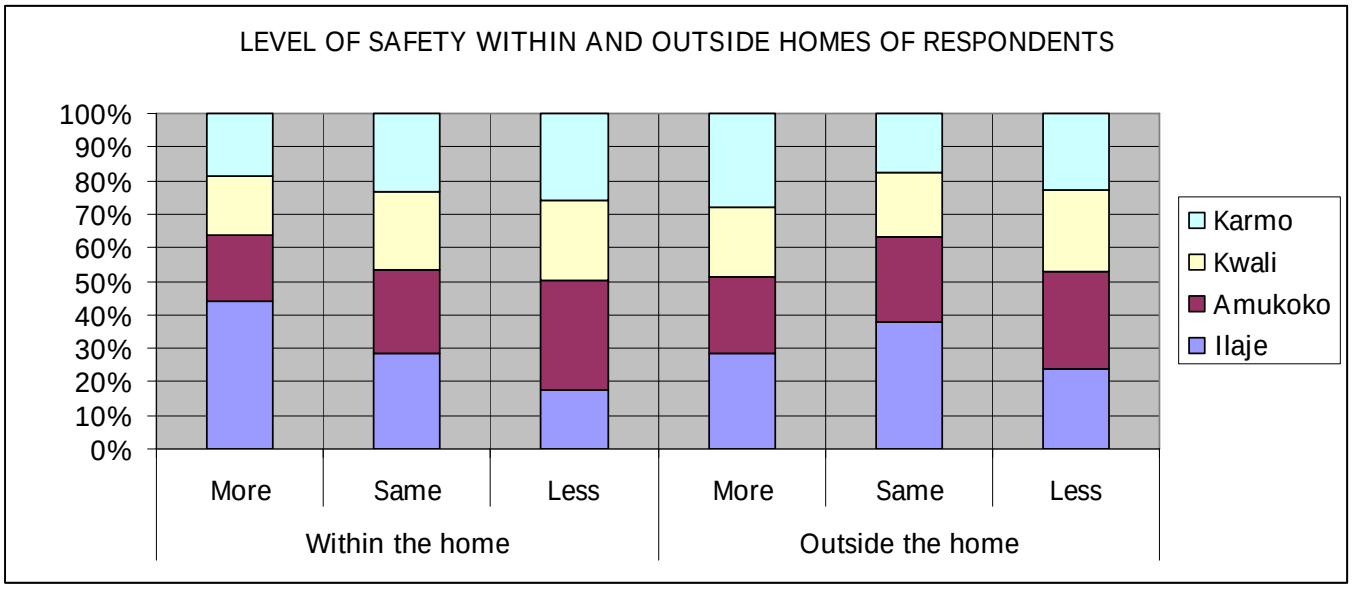
4.1.13 Leisure

Major leisure activities in the communities include watching television, visiting friends, reading newspapers, listening to music, staying at home etc. The most important leisure activity reported was watching television (reported by 58.3 percent of the respondents), followed by staying at home (49.9 percent) and visiting friends (45 percent). About 29.3 percent of the respondents took reading newspaper as leisure time. Interestingly, only 6.9 percent reported partying as a form of leisure. The poor economic situation of respondents could be responsible for the low social activities in the communities as 4.2 percent respondents actually reported they have no leisure time.

4.1.14 Physical safety

The level of security within home shows that in Ilaje, majority of the respondents are more secured while majority of respondents in Amukoko are less secured. The situation of security remained the same both in Kwali and Karmo. Conversely, the level of safety outside respondents' respective homes indicated that majority in Amukoko, Kwali and Karmo are not safe outside their homes while Ilaje people responded that they are safe outside their homes (Figure 4.13, Table A1.14). The respondents were not sure why they have these situations, since there are no streetlights in any of the areas, and no statistics available to support the respondents' assertions.

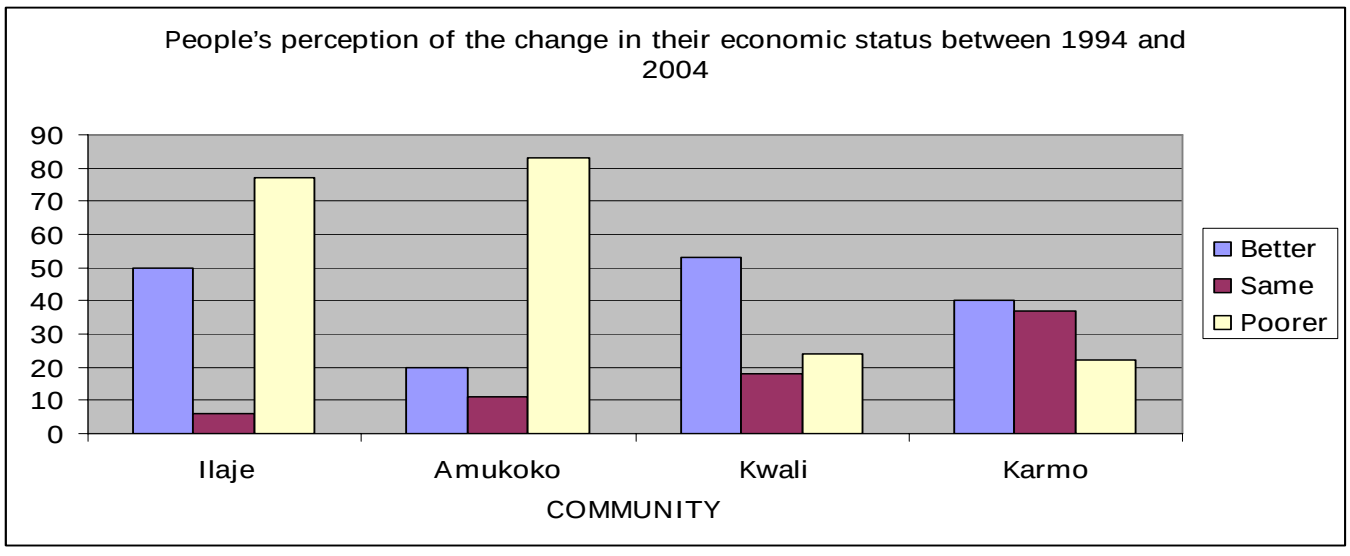
Figure 4.13 Perceptions of change in levels of safety within and outside respondents' homes during a five year period (2000 – 2005)



4.1.15 Economic opportunities

A 10 year comparison of economic opportunities in 1994 and 2004 revealed that in Lagos, more people were poorer in 2004 than in 1994 while the reverse is the case in Abuja where less poverty was reported in 2004 than in 1994. This can be linked to the shift in the seat of government from Lagos to Abuja with the corresponding mass movement of most government officials to Abuja (Figure 4.14,Table A1.15). The influx of civil servants to Abuja within this period created the enabling environment for more enterprises development and increased economic empowerment of the people in Abuja while the economic fortunes of Lagos declined.

Figure 4.14 People's perception of the change in their economic status between 1994 and 2004

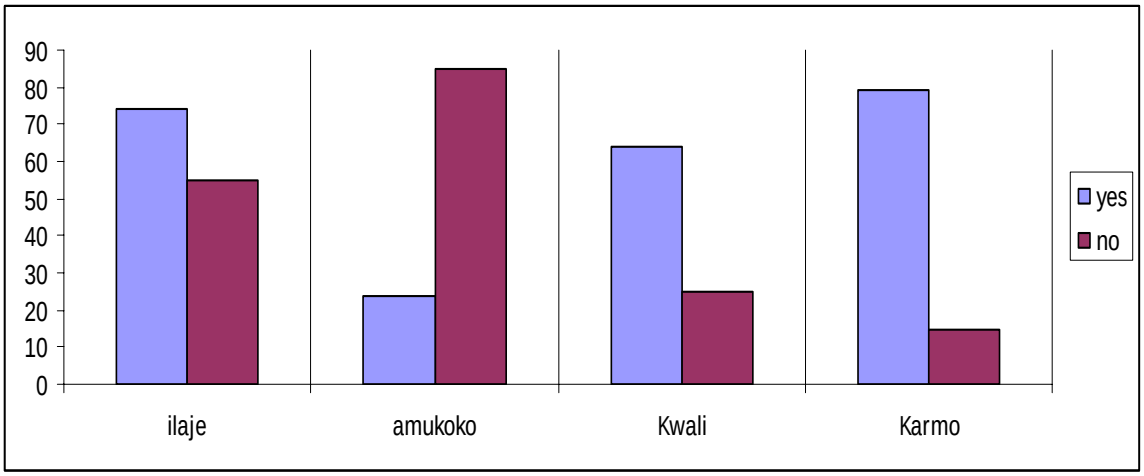


4.2 Elements of energy affordability and physical well-being and productivity of households (Hypothesis 2)

4.2.1 Membership of any organization

Of the 421 respondents 57% confirmed that they belong to one organization or the other. The largest number of respondents belonging to organizations lives in Karmo. Majority of the respondents in Ilaje, Kwali and Karmo belong to one organization, while Amukoko has the least (24%) number of community members that belong to organizations (Figure 4.15). Most of the Amukoko community members work for an average of 12 hours a day and six days in a week, which could be the reason for the lack of social activities.

Figure 4.15 Membership of organizations among respondents



4.2.2 Type of organizations

The main organizations in the communities are basically religious, social, business, traditional and cooperative. Figures 4.16a-d show the distribution of organizations to which the respondents needed to belong to get energy installed or connected and repaired or maintained. Most of the respondents belong to religious organizations. Of the 207 respondents who responded to the type of organization household members need to belong in order to get installation, 109 respondents (52%) belong to either a Christian or Muslim association. Other organizations to which respondents belong to are Cooperative Societies (9%), Social Clubs (8%) and Business Associations (4.5%).A cooperative society is a group of people who come together to improve their economic status through their activities. Sometimes the members raise

loans jointly and the cooperative is registered and recognised by government. Organizations to which household members need to belong to get repairs and maintenance, connection and energy follow the same trend with membership of religious organizations dominating the trend. For example, about 40 percent of the respondents belong to religious organizations for the repairs of their energy services. This compares with 23 per cent, 15 percent and 9 percent for cooperative society, social club and business association respectively. For electrical connection, religious organization recorded 19 respondents out of 54. Affiliation with religious organizations also plays a critical role in the access of community members to energy (Figure 4.16d).

Figure 4.16a: Type of organisation to belong to get Electricity installation

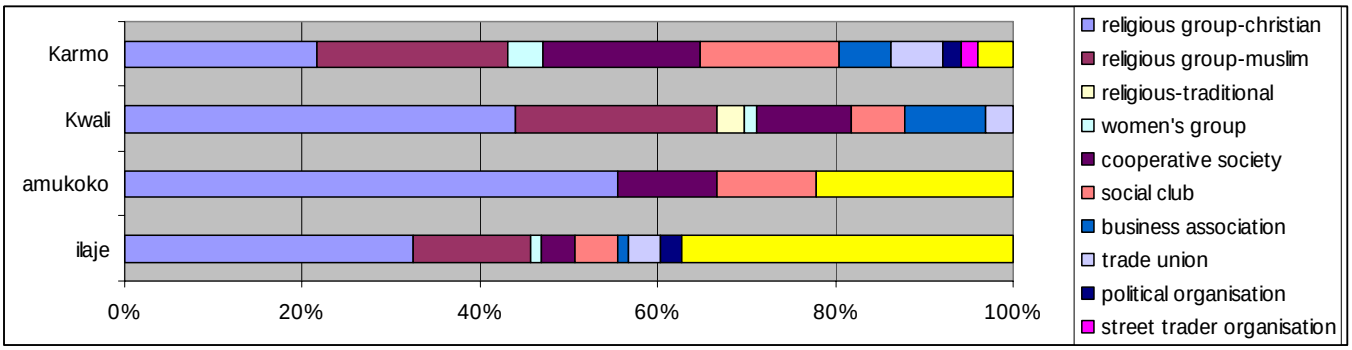


Figure 4.16b Type of organization one needs to belong to maintain energy services

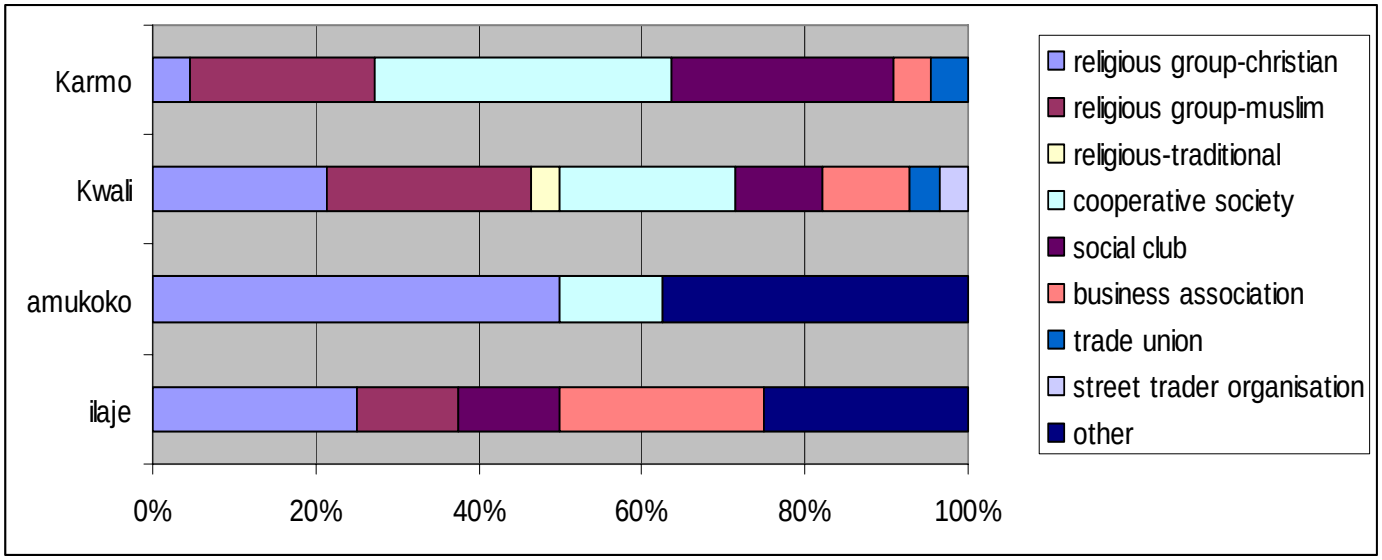


Figure 4.16c Type of organization one needs to belong to for electrical connection

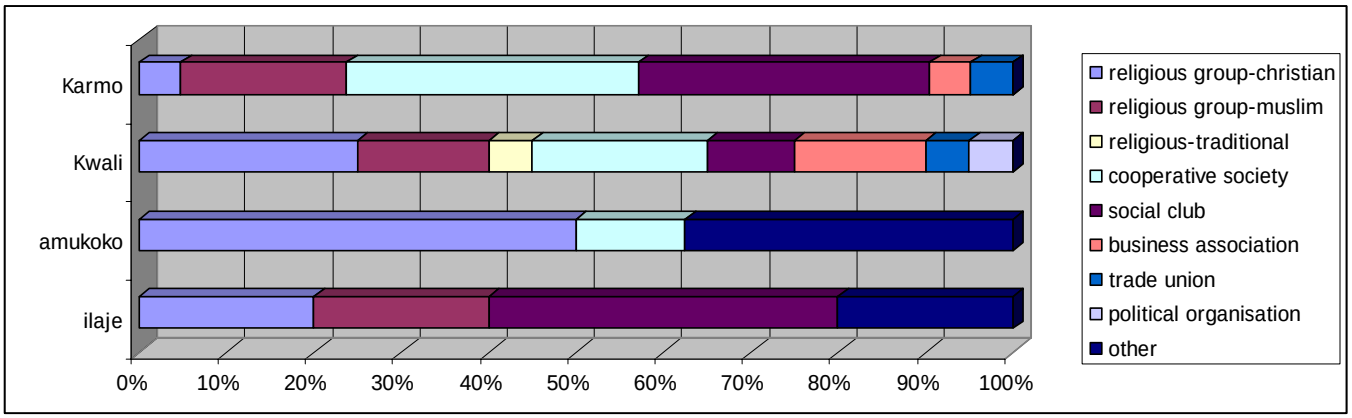
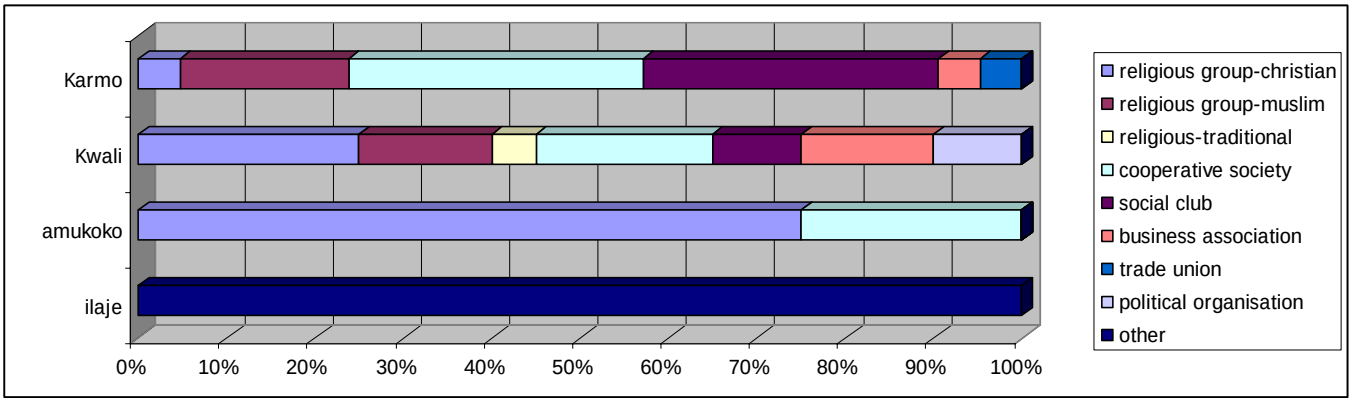


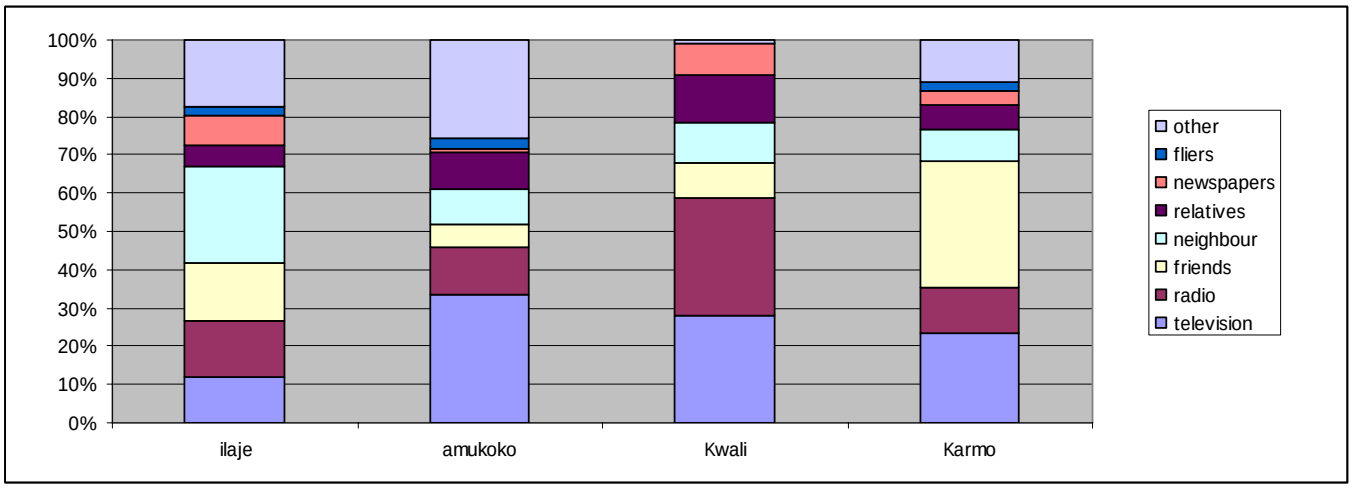
Figure 4.16d Type of organization one needs to belong to get access to energy



4.2.3 Sources of information

Television is the most versatile source of information on energy and other social issues in the communities with 23 percent of the respondents reporting its use. This is followed by the radio (18%) and newspapers (5%). In general, the low economic level of most of the respondents accounts for the very low importance of newspapers as a medium of information dissemination among the communities (Figure 4.17).

Figure 4.17 Energy information sources



4.2.4 Willingness to buy energy from third party

In all, about a third of the entire respondents showed the willingness to buy energy from the third party. Community members in Karmo accounted for 31.9% of respondents that are in favour of patronizing any third party if available while 20.7 percent, 24.4 percent and 23 percent in Kwali, Amukoko and Ilaje showed interest respectively (Figure 4.18a). Reliability and price competitiveness are the major reasons given by the respondents for their willingness to buy from proven third party. Those unwilling to switch from NEPA displayed no knowledge of such opportunities and are unsure of quality of service (Figure 4.18b).

Figure 4.18a Willingness to source electricity from third party

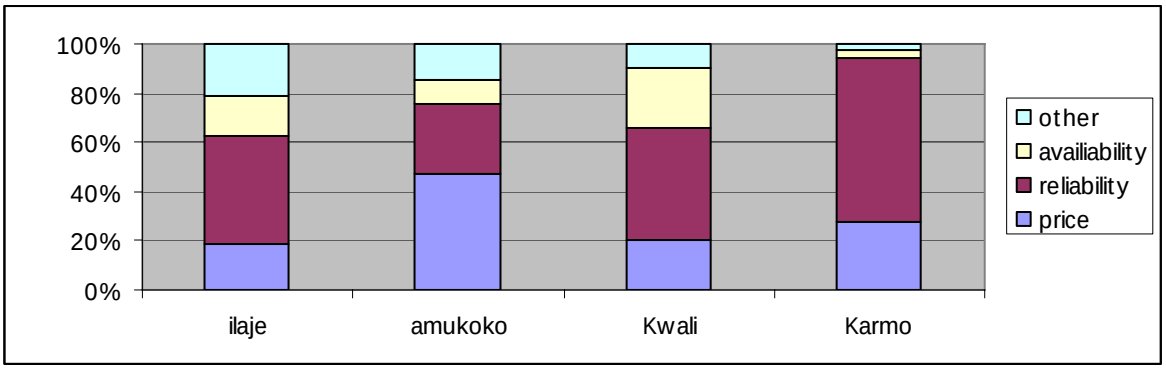
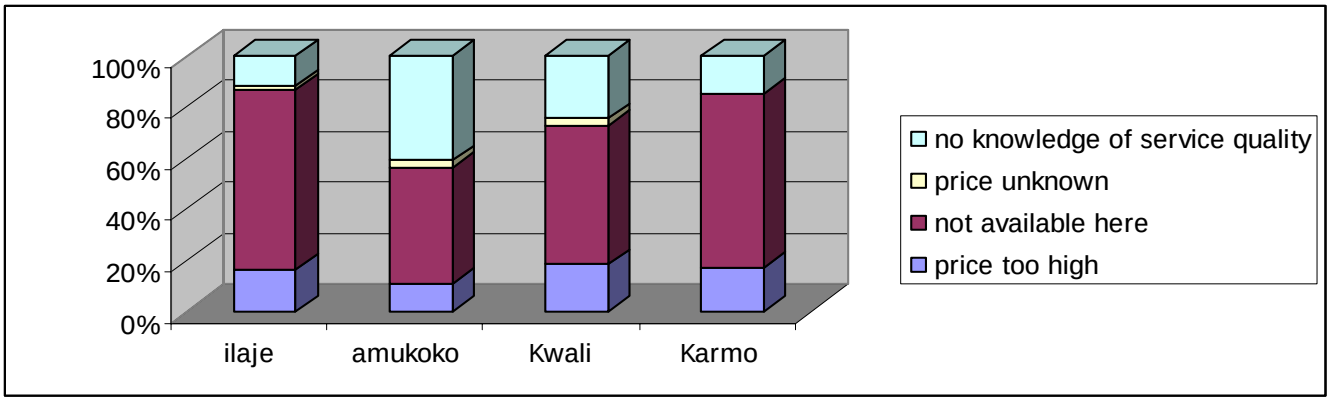


Figure 4.18b Unwillingness to source electricity from third party



4.2.4 Electrical installation and repairs

The professionals (technicians/electricians) accounted for the bulk of individuals that install electrical facilities in the communities. About 94% of the respondents reported that professionals usually undertook their electrical installations (Figure 4.19a). Self-installation is minimal in the communities. For electrical repairs, electricians accounted for 55.4 percent of the respondents while 31 percent preferred to use professional technicians. Self-repairs (some of which are illegal) are also minimal in the communities (Figure 4.19b).

Figure 4.19a Sources of electrical installation

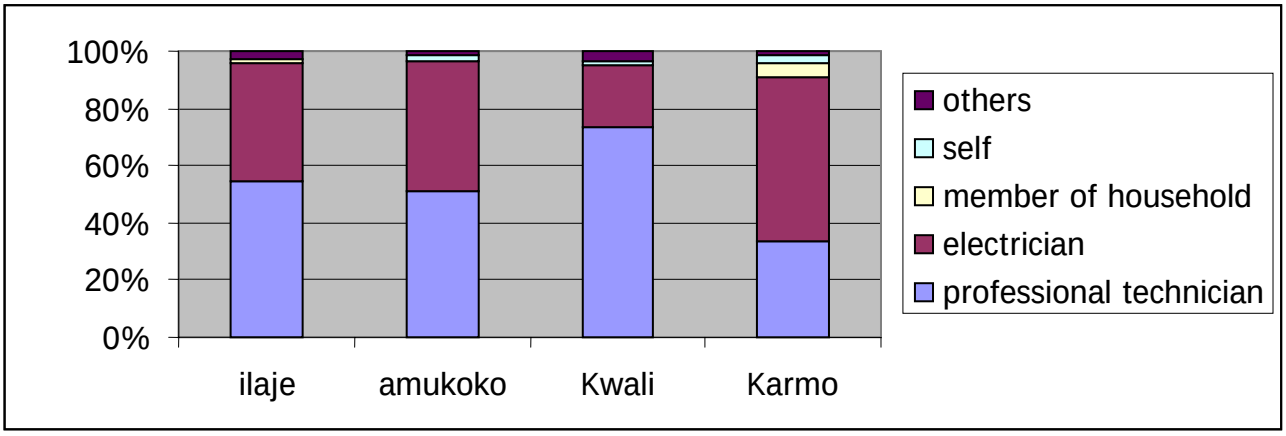
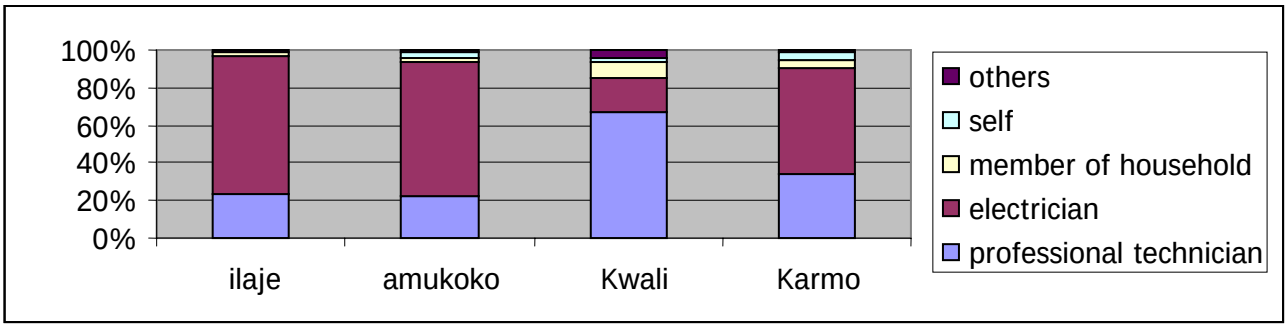


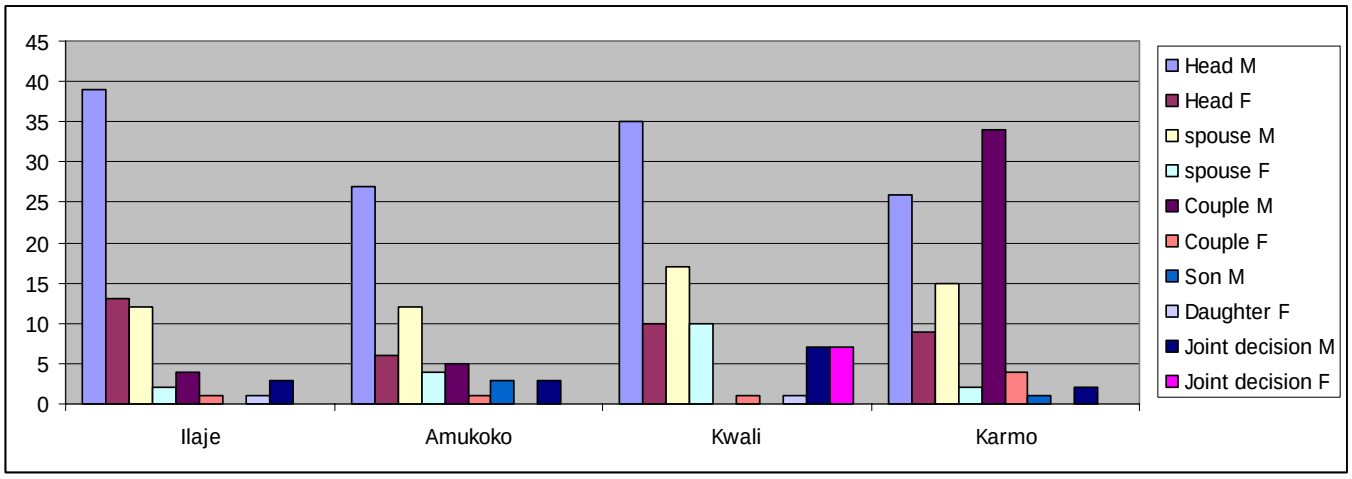
Figure 4.19b Sources of electrical repairs



4.2.6 Decision on the use of fuel

The survey revealed that the decision on the use of fuel was most of the time taken by the head of the household or the spouse while joint decision was least preferred (Figure 4.20). From Table 2.6a the decision on the use of fuel is taken by the men (77%) who are in most cases the head of household across the four communities sampled.

Figure 4.20 Decision-making on fuel use

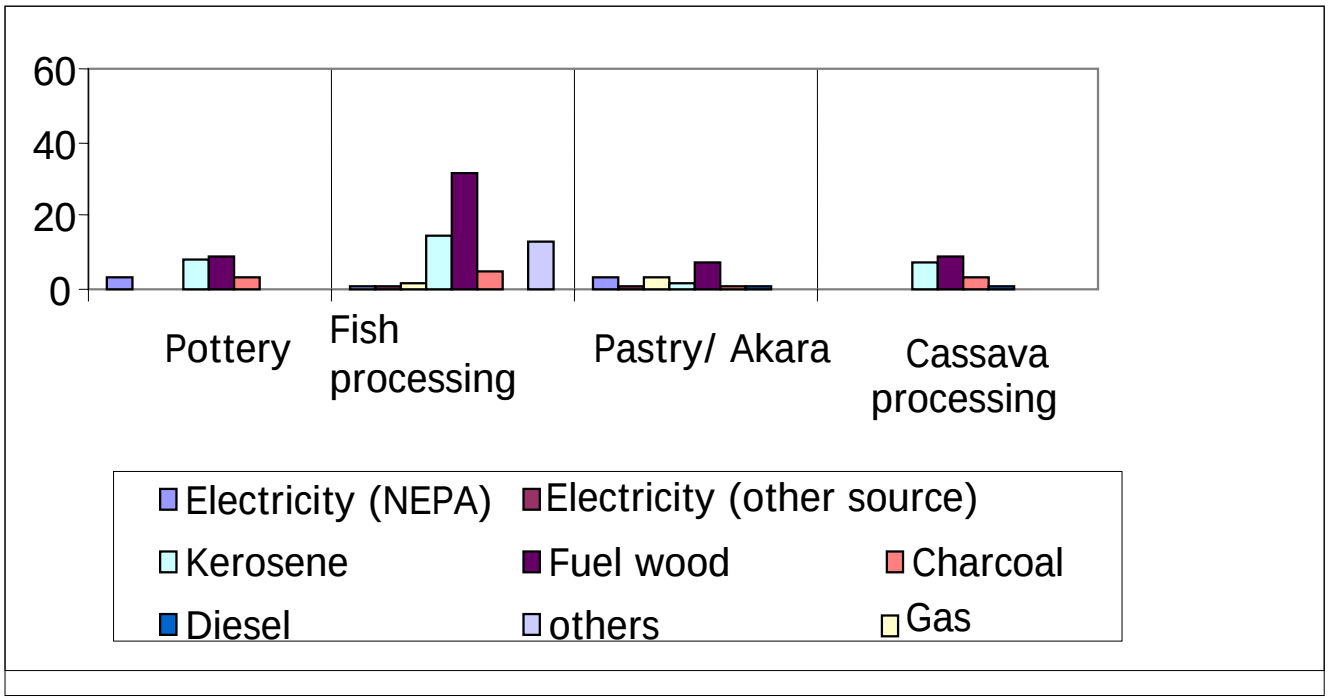


4.3 Elements of affordable energy services and sustainable livelihoods (hypothesis 3)

4.3.1 Forms of energy used

Table A3.1 in Appendix III shows the forms of energy used in the sampled communities. It shows that the forms of energy used vary across the enterprises. For pottery, fuel wood is the major form of energy used (39%) followed by Kerosene (35%) and charcoal (13%) in that order. For fish processing, fuel wood constitutes the main source of energy used (46%) by various enterprises, followed by charcoal (26% and kerosene (22%). For akara/bean pastry, fuel wood again remained the major form of energy (39%), while 17% of the respondents reported the use of LPG and electricity (NEPA) in each case. For cassava processing, fuel wood accounted for 35 percent of the usage while kerosene accounted for 45% of the energy used. Taking the average, 40% of the enterprises reportedly use fuel wood, followed by kerosene (26%) and charcoal (21%). Thus, fuel wood and kerosene are the major forms of energy used in the enterprises under study.

Figure 4.21 Forms of energy use among sampled enterprises.



4.3.2 Main Sources of Energy/Technology for Akara, Cassava Processing, Pottery, Fish Processing

Pottery: Manual energy is mainly used while electric machines are used by few for mixing of clay and sharpening of the finished products. LPG and fuel wood are used for heating of the clay, while charcoal and fuel wood are used for firing the clay (Table .

Fish processing: Dressing is done manually while petrol and diesel powered canoes are used for fish harvesting and charcoal, fuel wood and kerosene are used for smoking.

Cassava processing: Peeling and washing is done manually, but grating is done with petrol engine. Heating and cooking are done with charcoal and kerosene, and the lighting of sheds for cassava processing is by electricity, kerosene and candles.

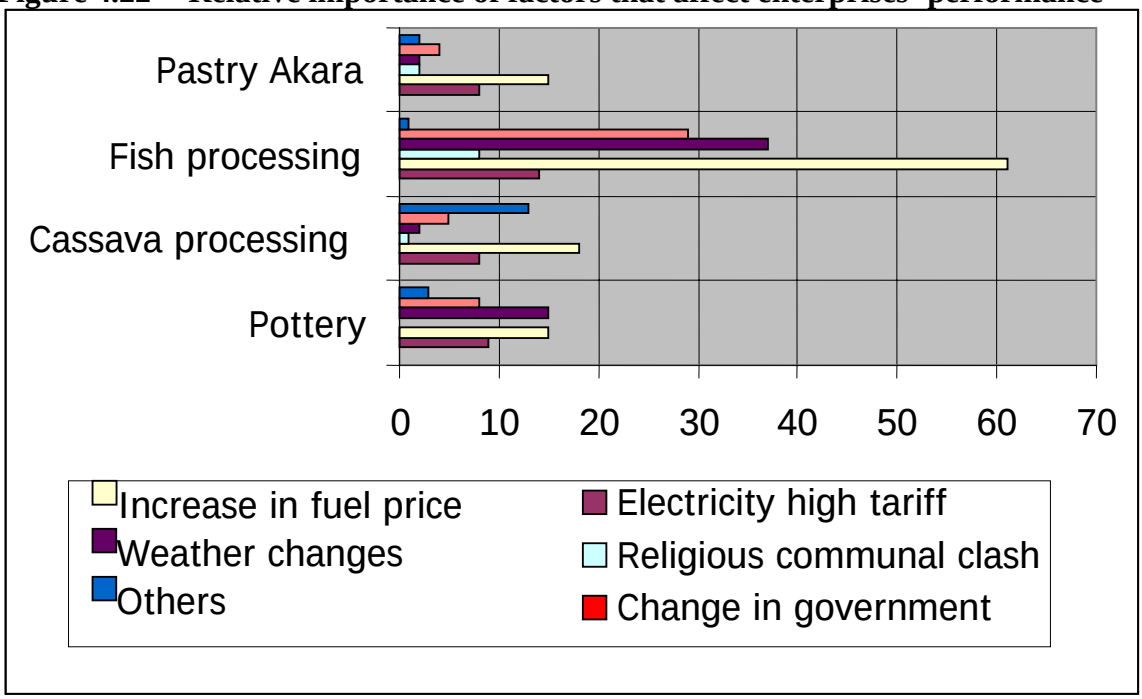
Akara/pastry making: The grinding of the raw material (beans/cowpeas) is done both manually and by petrol engine, depending on the economic status. The mixing is done manually and with mechanical mixers. Frying is done with LPG, charcoal and mainly fuel wood, while the lighting of sheds is by electricity and kerosene.

In general, the pattern of the sources of energy/technology is very diffuse among the various enterprises studied. Entrepreneurs adopt a mixture of sources and technologies for processing their products (Tables A3.2a – A3.2d).

4.3.3 Factors influencing enterprises' performance

Of the various factors considered (e.g. increase in price, community conflicts, weather vagaries and changes in government policies), increase in cost of petroleum products stood out as the major development that affects all the enterprises (Table A3.3). The high cost in fuel wood is a significant factor that affects the performance of the sampled enterprises (Figure 4.22). The price of fuel wood usually goes up by 50% to as high as 100% during the rainy season which means a bundle of 1kg fuel wood that costs N100 during the dry season can cost ₦150 to ₦ 200 during the rainy season. The price of kerosene on the other hand only increases whenever there is a hike in the price of petroleum products.

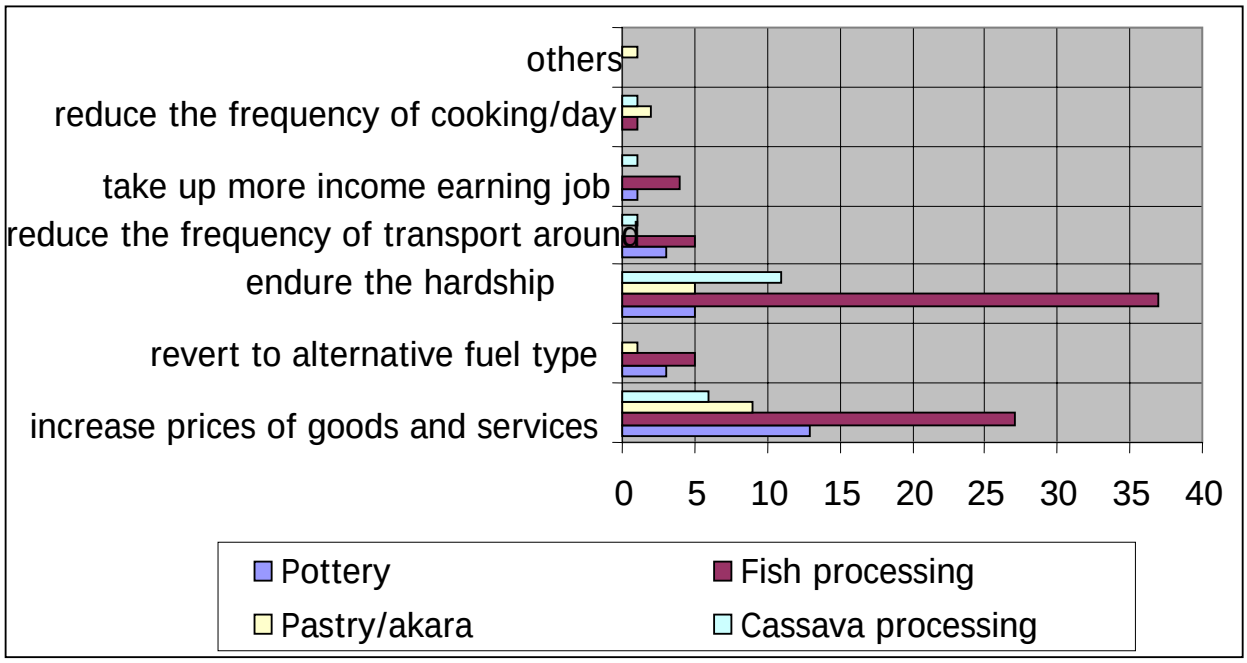
Figure 4.22 Relative importance of factors that affect enterprises' performance



4.3.4 Coping with changes in the entrepreneurship enabling environment

In the face of changes in the enabling environment that could affect the performance of enterprises, entrepreneurs have adopted a number of coping strategies. They range from increasing the prices of their goods to reverting to cheaper sources of energy or just endure the hardship. Increasing the prices of their goods and services and enduring the hardship are the two major strategies frequently mentioned by the respondents across the communities and enterprises Table A3.4.

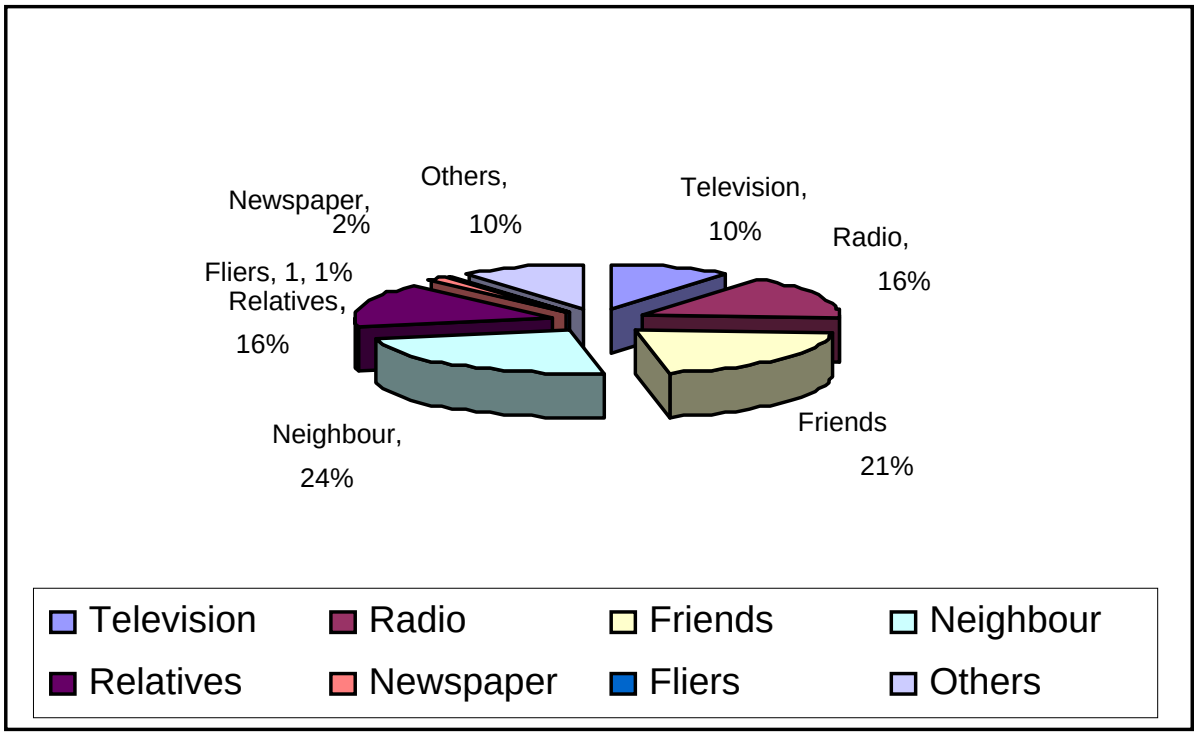
Figure 4.23 Coping strategies of enterprises in the face of changing enabling environment



4.3.5 Sources of information on energy

Irrespective of the activities involved, the major sources of information as revealed in the TableA3.4, and Figure 4.24 were through neighbours, 24%, friends 21%, radio and relatives 16%. This is not surprising considering the economic status of the respondents. Radio is generally readily affordable whileonly 10% of respondents claim television as their source of information. These media provide information about energy (such as fuel price hike, increase in the cost of electricity, energy regulation, price of LPG, kerosene, etc.) and other issues, social, political, etc. among the community members, while newspapers and fliers hardly feature.

Figure 4.24 Source of information on energy



4.3.6 Working hours/day

Table 4.1 shows the number of hours and days in which entrepreneurs are engaged in their trades. It shows that the people surveyed work for an average of 10 hours/day and about 6 days per week on processing and selling of their products in most of these enterprises when needed. Therefore, most of the entrepreneurs work from dawn to dusk on daily basis from Monday through Saturday.

Table 4.1 Business timeframe of entrepreneurs.

	Enterprises	**Wet Season**	**Dry Season**
Working hours/day (processing and selling)	Pottery Fish smoking Akara/Pastry Cassava Processing	12 hrs 12 hrs 6 hrs 14 hrs	12 hrs 12 hrs 6 hrs 14 hrs
Time spent on processing	Pottery Fish smoking Akara/Pastry Cassava Processing	7 hrs 6 hrs 6hrs 6hrs	5hrs 6hrs 6hrs 6hrs
No of work days	Pottery	2 days	3 days

lost/last 3 months	Fish smoking Akara/pastry Cassava	4 days 3 days 3 days	3 days 3 days 3 days
Alternative use of working hours	Potters Fish processors Pastry/Akara Cassava processor	Resting at home and social activities Resting at home and social activities Resting at home Resting at home	

4.3.7 Government role

A summary of government interventions mentioned by respondents as capable of cushioning the effect of policy changes in the performance of their enterprises, with particular reference to energy use, is given in Table 4.2. Improved access to micro-credit, subsidy to reduce price of petroleum products, reduction in electricity cost and improvement in public transportation systems are the main entry points of support identified by the respondents.

Table 4.2 Possible government intervention to make energy affordable

Enterprises	Pottery	Fish smoking	Akara/pastry	Cassava
What government could do to promote the profitability and growth of business	Provision of small business centre		Provision of small business centre	
	Access to business loans/credit	Access to business loans/credit	Access to business loans/credit	Access to business loans/credit
	Reduction in price of petroleum products	Reduction in price of petroleum products	Reduction in price of petroleum products	Reduction in price of petroleum products
	Reduction in NEPA tariff	Reduction in NEPA tariff	Reduction in NEPA tariff	Reduction in NEPA tariff
	Improvement of public transportation systems	Improvement of public transportation systems	Improvement of public transportation systems	Improvement of public transportation systems

	Improvement of infrastructure (road maintenance, network development, electricity and water supply			

CHAPTER FIVE: DISCUSSION OF RESULTS

5.1 Introduction

The general results presented in Chapter four are now used to deduce the validity or otherwise of the four hypotheses that were proposed in Chapter two. The discussion is general as no rigorous statistical assessment was used. To recap, the following are the four hypotheses:

Hypothesis One: There is a good and direct relationship between affordable energy services and people's well being.

Hypothesis Two: Social networks facilitate community members' access to energy services.

Hypothesis Three: Performance of enterprises is directly related to availability of energy services.

Hypothesis Four: Energy sector reforms are critical to improved access to clean and affordable energy services by local enterprises.

5.2 Affordable energy services and people's well being (Hypothesis one)

As earlier indicated, clean forms of energy in the communities studied include electricity, LPG and kerosene. In general, these forms of energy should be available to the Nigerians for a healthy population and a friendly environment. The results presented in chapter four have shown that electricity is the energy form mostly used by the poor for lighting both in the new and old urban areas. However, the communities do not enjoy regular supply even with a complaint of high tariff. The implication of these power problems is that residents have been switching to the use of kerosene which an alternative energy source considered more reliable. But kerosene is not as clean and efficient as electricity. The availability and access to electricity supply play an important role in facilitating household activities. The energy related activities of surveyed households include lighting, cooking, washing, bathing, ironing, grinding, entertainment etc in which electricity is mostly used. Irregular supply of electricity has been identified by the respondents as contributing negatively to both their well being and productivity.

In terms of household energy in the surveyed communities, as in most peri urban communities, women are usually responsible for energy provision within the household and for tasks that ensure the well-being and survival of the family. Due to cultural factors most of the women interviewed accord leadership roles to their husbands even when they are the breadwinners of their families. This implies that some of the data in Tables A2.6a to A2.6g, which showed that men are responsible for decisions on procurement of energy for the family may not necessarily be true. The women bear the burden of energy use in the household, as they are in direct contact with the smoke from unclean fuel sources from cooking and other domestic activities.

The use of kerosene by majority for cooking in the urban poor settlement, especially in Lagos (Table A1.1) may be attributed to the environment in which the respondents live, where there are no provisions for cooking facilities such as kitchens. Most cooking in these communities is done in their rooms or along hall ways.

The results of the survey indicate that people have preference for cleaner burning appliances such as gas and electric cooker (Table A1.6). This is connected with the level of awareness of household members on the environmental and health benefits.

Thus we conclude that clean and affordable energy services are important for good physical well being and productivity of household members**.**

5.3 Social networks and access to energy services (Hypothesis two)

Many of the members of the sampled communities belong to one organization or the other. Religious organizations dominate the types of organizations the community residents belong to. About 52 percent of respondents belong either to a Christian or Muslim associations. Other organizations to which respondents belong are cooperative societies, social clubs and business associations.

Religious organization dominated the types of organizations the community residents belong to. Of the 207 respondents who responded to the type of organizations household members need to belong in order to get installation, 109 respondents (52%) belong to either a Christian or Muslim association. Other organizations which respondents belong to are Cooperative Societies (9%), Social Clubs (8%) and Business Association (4.5%). It is very informative that faith based associations give respondents social connections, while cooperatives give the economic means needed for their enterprises.

Since the majority of respondents belong mainly to religious organizations and there are fraternal relationships among members of the same religious groups, the respondents can get repairs and maintenance, connection and energy from technicians and staff of NEPA who are members of these religious organizations. The services may not be free, but they will definitely accomplish such jobs at subsidized rates. We therefore conclude that social networks and relationships can facilitate access of the poor to energy services.

5.4 Energy services and viability of enterprises (Hypothesis three)

The empowerment of women through unrestricted access to affordable energy is very vital in broadening opportunities for women in economic and social life. The use of appropriate sources of energy in their production/enterprises activities has the potential of reducing the poverty of the women and drudgery associated with household and enterprises' activities. This could lead to increased revenue realized from the enterprises which could be channelled to increase the women's nutritional, social and medical needs, thereby, enhancing the quality of their lives and standards generally.

Nigerian women are very entrepreneurial as can be seen in the survey showed that most women will always look for a means to meet up with their family's basic needs irrespective of the harsh economic conditions in the country. Women should therefore be encouraged in running their small scale enterprises for sustainable development.

The study focused on enterprises of low–income groups with linkages to energy consumption. Enterprises of key interest to this study in the urban poor settlement include pottery, fish processing, production of bean cake (Akara), cassava processing (fufu), all of which are energy dependent, informal and small-scaled. Many of the entrepreneurs have no bank accounts and have not benefited from any form of business loans. The enterprises are mainly owned by women and biomass is the main source of these enterprises as illustrated in the production processes given for each enterprise in Appendix V.

Pottery involves the use of various energy technologies (Table A3.2a),including kerosene and fuel wood as major sources of energy (Table 3.1). The use of gas, which is a clean fuel, is not sustainable and affordable because of its high cost. In the production process, metabolic energy plays a major role especially in the mixing of clay and the shaping of the clay into pots. This enterprise is mostly owned by individuals with the sole aim of increasing their income and creating opportunities for profit making, which is to be used for the family and self. Going by the plans of entrepreneurs to continue and maintain the size of the business, with a possibility of handing the businesses to their children, it is clear that the entrepreneurs prefer their businesses small as they have no plans for expansion. Entrepreneurs complain of poor roads, unreliable electricity supply, and lack of adequate water supply, as well as absence of business support services as affecting the growth of their enterprises.

Most of the fish processing is done in the market place and the neighbourhood of the respondents' homes. For those in Ilaje, it is a family business hence profit is spent on the family as a matter of priority before self, savings, and re-investment into business. Since it is a major source of income to the family, the entrepreneurs plan to continue with the present size with the hope of switching to another or a more profitable business or possibly hand over business to their children. In a discussion with the women, they would like to expand their business and improve on the method of fish smoking. However, the recent increase in fuel price that has resulted in the increase in fuel wood has drastically increased their cost of production which they are unable to pass to their customers in totality as a result of the general poor economic condition in the country.

The situation is the same with kerosene. The drum fuel wood stove used is locally sourced and it does not protect users against smoke inhalation. While this is of a major concern to the researchers and was pointed out by the respondents, the latter were not willing to switch to a modern energy technology. The concern is that it will not give the same flavour as that processed by fuel wood.

Fish smoking has been affected by the increase in fuel price particularly in the areas of income and growth in business size (Table A4.5). The inability of fish harvesters to move their engine boats to filling stations for fuel due to policy issues may have also contributed to the impact on income as more money is spent in buying petrol in containers from third parties, which is illegal in Nigeria.

Production of bean cake (akara) is done in respondents' houses, neighbourhoods, market places and other neighbourhood. Operators started this informal business, owned by individuals, after apprentice of about 6 months, as a means of livelihood. Profit from this business is spent on family, self, personal savings and business re- investment. In the process, heating/frying uses four different technologies such as gas cooker, kerosene stove, etc (Table A3.2d). With fuel wood as a major source of energy for this enterprise (Table A3.1), the increase in fuel price has affected the growth of the size of the enterprise as more money is spent on the fuel wood, which has more competitors now. Although majority increase the prices of their goods and services to cope with the situation (Table A3.4) many of them would move to a more profitable business in the next 3 years. The hardship this effect has placed on their living conditions has been endured, according to them.

Cassava processing is mostly owned by individuals and partly located in entrepreneur's houses. This enterprise is usually established to increase income for household expenses. Fuel wood and kerosene are major sources of energy for this enterprise. Increased fuel price has affected this enterprise, but entrepreneurs tend to endure the hardship it has placed on their living conditions. The entrepreneurs are of the view that government's help in accessing credit can promote the profitability and growth of business as well as a reduction price of petroleum products, and reduction in electricity tariff, just as improvement in public transport will enhance their business growth and livelihoods.

The use of biomass and manual processes by these enterprises involves a lot of drudgery. This can be reduced with improved access to clean and affordable forms of energy, thereby giving the women more time for their families and other social activities. From the above, we conclude that there is a good relationship between energy services and the viability of the surveyed enterprises, as well as the establishment of new ones.

5.5 Energy sector reforms and access to clean and affordable energy services (Hypothesis four)

Women and women have different roles in society, do different types of work, have different access to/and power over resources and therefore have different needs. Between the different needs of human beings, a distinction can be made between strategic needs and practical needs. Practical gender needs are needs women and men have coherent to their roles in society and focus like employment, food, water and

health care and energy. The practical gender needs are easy to identify, tend to be short-term and are material. The strategic gender needs are more difficult to identify, because they tend to be ideological and long-term. These needs are about improving the unequal position of some gender groups and induce change in power relations between men and women.

The Nigerian government is currently implementing public sector reforms geared towards reducing poverty, eradicating corruption, and empowering the private sector to become the engine for economic growth. This reform initiative called the National Economic Empowerment and Development Strategy (NEEDS) has identified the deregulation of the downstream oil sector as a key aspect of the reform programme.

Deregulation of the downstream petroleum sector has been a major policy objective of this government where petroleum marketers will be allowed to import and sell refined products based on import parity. In October 2003, the government announced the full deregulation of the downstream sector. Because it will be free entry and exit, it is believed competition will eventually drive the prices of the imported commodity down. In other words, deregulation is not synonymous with increase in prices, even though that may be one of its short-term consequences. With competition in the industry, there will be more rational allocation of resources, which in the long run will lead to price stability and even decline in prices.

Despite the convincing argument for total deregulation of petroleum downstream sector, the evidence so far is that it is leading to frequent increases in prices. Thus we may conclude that while energy sector reforms can lead to improved access to clean and affordable energy services by enterprises if transparent and well implemented, the commercialization and privatization of the sector in Nigeria will make products more readily available to enterprises but at a higher price, at least in the short run. The consequence for the poor in the communities studied is that they would increase their dependency on fuel wood, which unfortunately is less efficient and not very clean. Thus, the imperative for government to develop and implement pro-poor policies to make clean and affordable energy services to the people cannot be overemphasized. There is also the need for the formulation of a gender-aware energy policy, which would help overcome gender-inequality in energy access in order to facilitate women empowerment as a way of achieving the MDG goals 1 and 3 which aims at eradicating poverty and promoting gender equality and women empowerment.

CHAPTER SIX: RECOMMENDATIONS

Based on the results of the study, the following are recommended for consideration by government to make the National Energy Policy more pro-poor and gender sensitive:

- Subsidy and taxation on fuels should be designed to achieve easier access to cleaner energy by the poor, based on the welfare of the people and not just on the economic benefits to the Government alone. Smart subsidies on energy consumption for the poor should also be considered.

- Need to increase widespread access to fuel supplies as this is important in encouraging transition to modern fuels. Equity of access across the nation should be given priority for the poor are to access higher-grade and more efficient fuels. Incentives should be provided for the private sector to invest in refineries, while government owned refineries should be privatised.

- Appropriate finance mechanism for equipment and fuel supply should be put in place to allow a wider access of the poor to higher-grade and more efficient fuels at a lower unit cost.

- The newly created energy utility company should be more customer-friendly and create awareness in the area energy efficiency and sustainable use.

- Low tariffs for the poor, as proposed in the fourth coming electricity act, should be properly implemented.

- Pre-paid metering and billing systems should be introduced to discourage the currently rampant illegal connections to the systems of the national electricity utility. This will improve the revenue generation of the company and enhance its performance.

- Renewable energy technologies to provide electrification should be encouraged and supported for rural and the poor urban communities.

- Most of the enterprises surveyed are carried out by women. It is therefore important that political conscious effort should be made to encourage effective women participation in policy and decision making. There is the need for affirmative and pro-active action to encourage women into policy making bodies by reserving at least 30 percent of the membership composition for women to occupy in energy related policy making bodies.

- The federal and state governments should implement their site and services schemes in order to provide infrastructures and utilities to squatter peri-urban settlements where the urban poor mostly reside.

- There is the need for R and D activities to improve electricity supply.

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APPENDICIES

Appendix I: Questionnaire Used for the Survey

QUESTIONNAIRE FOR ENABLING URBAN POOR LIVELIHOODS POLICY MAKING: UNDERSTANDING THE ROLE OF ENERGY SERVICES IN NIGERIA 2004

Husband or wife or senior member of household should be interviewed

QUESTIONNAIRE FOR HOUSEHOLD SURVEY

Questionnaire and enumeration data:

(*Italics used for data coding only*)

Questionnaire no. (to be filled in by **data entry** persons):

Name of Community Area code (to be filled in by **enumeration supervisors**):

Name of Street (to be filled in by **enumeration supervisors**):

Number of Housing Unit (to be filled in by **enumeration supervisors**):

Enumerator's name: ID Number:

Supervisor's name: ID Number:

Date: (*e.g. code 2204*)
Time start: (*e.g. 0820*)
Time finish: (*e.g. 1540)*

Opening Statement:

My name is .....……..., and I am working for **Friends Of The Environment** on a study for DFID - ENERGIA on **Enabling Urban Poor Livelihoods Policy Making: Understanding The Role Of Energy Services,** in Lagos and Abuja. You have been randomly selected as one of the subjects for interview. We would like to ask you some questions about your household, energy use and livelihoods.

We have received permission from the Local Government Council to conduct this study. The interview will take less than an hour. Your response will assist the programme. It will improve our understanding of your energy needs and how to satisfy them.

Your answers will be completely confidential. Only summary information will be used, and no individual questionnaire will be made available to any authority. If there is any particular question that you don't like to answer, that will of course be accepted.

The purpose of the project is not to extract tax or attract any form of payment.

Language used for the interview :

English:	*1*	Pidgin English	*2*
Yoruba	*3*	Hausa	*4*
Igbo	*5*	Other Specify	6

1.[Enumerator to fill] Person interviewed in household:

Husband	*1*	Wife	*2*
Senior member of household	*3*	Most enlightened member of household	*4*

SECTION A: SOCIO-DEMOGRAPHY OF RESPONDENT AND HOUSEHOLD

2. **Enumerator: Please ensure you get the total number of household members and complete this table accordingly. Names are optional**

S/n	A0 Member of Household	A1 Gender	A2 Age As At Last Birthday	A3 Relationship To The Head	A4 Marital Status	A5 Occupation	A6 Education	A7 Religion	A8 Tribe	A9 Nationality
01										
02										
03										
04										
05										
06										
07										
08										
09										
10										
		Male = 1 Female = 2	Below 5 = 1 5 ↔14 = 2 15 ↔ 24 = 3 25 ↔ 34 = 4 35 ↔ 44 = 5 45 ↔ 54 = 6 55 ↔ 64 = 7 65 and above = 8	Spouse = 1 Son = 2 Daughter = 3 Relation = 4 In-Law = 5 Others = 6	Married = 1 Divorced = 2 Separated = 3 Widow = 4 Single = 5	Trader = 1 Transporters = 2 Student = 3 Fish-smoker = 4 Cass Processor = 5 Civil Servant = 6 Others------ Specify	None- 1 Attended pry sch = 2 Completed Pry= 3 Attended Sec sch = 4 Completed Sec = 5 Attd Higher institution = 6 Completed High inst - 7 Others ---- specify = 8	Islam = 1 Christianity = 2 Traditional =3 Other Specify = 4	Yoruba = 1 Hausa = 2 Igbo = 3 Egun = 4 Gbagyi = 5 Efik/Ibibio= 6 Gwari = 7 Other Specify = 8	Nigerian = 1 Non Nigerian (West African) = 2 Non Nigerian Rest of Africa = 3 Other specify = 4

3. What other major job do you engage in to support your household?

a. Local transport services	1
b. Trading	2
c. Farming	3
d. Technical	4
e. Security	5
f. Housekeeping/ baby sitting	6
g. Not Applicable	7
h. Other: Specify	8

4. Type of Family (Tick only those who constitute the household

Father/husband/single	1
Mother/Wife/Single	2
Child	3
Relative	4
Friends	5
Other: Specify	6

5. How long have you and your household been living in this area? (Number of years) ☐

6. Which area did you live before you come here? .....…….

7. Do you have any relative living in this area? | 1 Yes | 2. No |

8. Do you plan to continue living in the area? Yes: *1* No: *2*

9. If yes or no please give reason(s) _____

10. Which of the following items is owned by your household?

	During Military Administration			**During Civilian/Democracy**		
	Yes	No	If yes, how many?	Yes	No	If yes, how many?
a.) A car	*1*	*2*		*1*	*2*	
b.) A motorbike	*1*	*2*		*1*	*2*	
c.) Air conditioner	*1*	*2*		*1*	*2*	
d.) A TV	*1*	*2*		*1*	*2*	
e)Microwave	*1*	*2*		*1*	*2*	
f)Radio/Cassette Player	*1*	*2*		*1*	*2*	
g)Video Player	*1*	*2*		*1*	*2*	
h)Electric Iron	*1*	*2*		*1*	*2*	
i) Blender	*1*	*2*		*1*	*2*	
j) Electric Fan	*1*	*2*		*1*	*2*	
k) A refrigerator	*1*	*2*		*1*	*2*	
l) A telephone	*1*	*2*		*1*	*2*	

m) A generator set	*1*	*2*		*1*	*2*	
n) Cooking gadgets	*1*	*2*		*1*	*2*	
n) Others ----- Specify						

11. Type of house the family live in? (Interviewer mark from observation)

1.2

a.)Single-household house or brick structure on a separate stand or yard	1
b.)Multi-household house or brick structure on a separate stand or yard	2
c.)Flat in a block of flats/high rise building	3
d.)Town/cluster/semi-detached house (simplex/duplex or triplex)	4
e)Room in main dwelling	5
f)Room in hostel	6
g)Other: Specify	7

12. What are the main materials used for the roof, wall and floor? (Interviewer mark from observation)

Material	**Roof**	**Walls**	**Floor Covering/Floor**
Bricks			
Cement block			
Corrugated iron			
Wood			
Plastic			
Cardboard			
Mixture of mud and cement			
Tile			
Carpet			
Linoleum			
Mud			
Thatching			
Asbestos			
Other (Specify			

13. How many family units live in this building (including your own)? Family units

14. Do you have a private or shared kitchen? Private *1* Shared *2* No in-house cooking *3*

15. Do you have a private or shared bathroom? Private: *1* Shared: *2* No in-house bath *3*

16. Are you the owner of this house? 1 Yes | 2. No

17. Do you pay rent for this house? 1 Yes | 2 No

18. If yes, how much do you pay for this house/apartment per month? (Naira) [Answer only one]

a.)Below 500	b. 500 to 1000	c.)1001 to 2000
d.)2001 to 3000	e.) 3001 to 4000	f.) 4001 to 5000
g.) 5001 to 6000	h.) 6001 to 7000	i.) above 7000

19. Please tick one or more of these development that have affected your livelihoods. (Rank them)

	Development	Rank
1	High tariff of electricity	
2	Increase in fuel price	
3	Religious/Communal clash	
4	Weather changes	
5	Change in government	
6	Others Specify	

20**.** Which one of these aspects of your livelihoods has been mostly affected by the above-mentioned?

1. Income
2. Health
3. Availability of food
4. Transportation
5. Others (Specify)
6. None of the above

21. What were your strategies for coping?
1. Increase prices of goods and services
2. Revert to alternative fuel type (Specify)--------
3. Endure the hardship
4. Reduce the frequency of transport around
5. Take up more income earning job
6. Reduce the frequency of cooking/day
7. Others (specify) _____

SECTION B. ENERGY In this section, we are going to talk about the different kinds of energy that this household uses for different purposes and the supplier.

22. What forms of energy do you use?

		Quantity used/month	Cost per unit	Are you satisfied?	Reasons
Electricity direct from NEPA	1				
Electricity from other source, e.g. generator, solar cell	2				
Electricity through informal/illegal connection	3				
Gas	4				
Paraffin/Kerosene	5				
Fuel wood	6				
Diesel	7				
Charcoal	8				
Other: Specify	9				

CODES : Yes = 1, No = 2

23. Electricity consumption metering:

Conventional meter	1
Prepaid card	2
Unmetered	3

24. Do you have a private or shared meter?

Private [1] Shared [2] Do not have [3]

25. What type of meter do you have?

Single-phase [1] Double-phase [2]
Three-phase [3] Do not know [4]

26. What are the major problems with your electricity supply?

High tariff/rate [1] Lack of maintenance [2]
Irregular supply [3] Do not know [4]

27. What do you do to reduce your energy consumption?

Turn off all appliance [1] Switch between appliances [2]
Reduce time appliances are used [3] Other Specify [4]

28. How much did you pay last month for Electricity? (NEPA) =N=……

29. Did you know you could buy power from third party? Yes: [1] No: [2]

30. If you get power from a third party, what encouraged you to switch

1. Price
2. Reliability
3. Availability
4. Others Specify--------

31. If not why aren't you buying from an independent power provider (IPP)

1. Price too high
2. Not available here
3. Price unknown
4. no knowledge of service quality

32. Who does your electrical installations and repairs?

	Installations	*repairs*
1.Professional Technician		
2. Electrician		
3. Member of household		
4. Self		
5. Others Specify		

33 What are the main sources of energy for each of the following end uses
(Note some of these cells need to be blocked out because certain energy sources cannot be used for some end uses).

Energy Sources	**A**. Lighting	**B**. Cooking	**C**. Boiling water for drinking	**D**. Heating bath water	**E**. Grinding	**F**. Washing	**G** Enterta inment
1. Electricity from grid							
2. Kerosene							
3. Petrol							
4. Diesel							
5. Charcoal							
6. LPG							
7. Car Battery							
8. Power generator							
9. Solar PV system							
10. Firewood							
11. Manual							
12. Lumber waster /wood waste?							
13. Other: Specify							

34. What is the energy technologies/appliances used for these household activities?

Energy Technology	**Lighting**	**Cooking**	**Boiling water for drinking**	**Heating bath water**	**Grinding**	**Ironing of clothes**	**Washing of clothes**
Rechargeable lamp							
Electric bulb							
Kerosene stove							
Gas cooker							
Electric cooker							
Washing machine							
Electric Blender							
Pressing Iron							
Water boiler							
Electric kettle							
Charcoal stove							
Candle							
Electric Fan							
Others Specify							

35. Where do you find out about where to get energy from?

Sources of Information	
Television	1
Radio	2
Friends	3
Neighbour	4
Relatives	5
Newspapers	6
Fliers	7
Other Specify…….	8

36. If given an option, what energy technology would you prefer for cooking?

Kerosene Stove	1
Gas Cooker	2
Fuel wood stove	3
Charcoal Stove	4
Saw dust stove	5
Electric cooker	6
Other …….specify	7

37. How many time(s) in a day do you use your cooking gadgets (not only meals) _____

38. On the average, how long does it take you each time you use it for meals _____min.

39. Enumerator to indicate if cooking environment is smoky or ventilated? Smoky [*1*] Ventilated [*2*] No [*3*]

SECTION C Well being and Productivity

In this section we are going to talk about the water used by this household for drinking, cooking, bathing, or washing clothes, and other household purposes including health, education issues and well- being.

40. What is the source of water used most often in this household for things like drinking or bathing and washing clothes? **(SINGLE MENTION ONLY)**

	Tick only one	Drinking	Bathing	Cooking	Cloth washing
Piped – internal	1				
Piped - yard tap	2				
Water carrier/tanker	3				
Piped - public tap/kiosk (free)	4				
Piped - public tap/kiosk (paid for)	5				
Borehole (manual)	6				
Borehole with pumps	7				
Rainwater tank	8				
Flowing river/stream	9				
Dam/stagnant water	10				
Well (non-borehole)	11				
Other (Specify).....	12				

41. Which of these problems do you encounter?

1. Poor quality
2. Unexpected interruptions-daily
3. Unexpected interruptions- occasionally
4. Inaccurate billing
5. Too far/ inconvenient to fetch
6. Others: Specify

42. If you have to fetch water, how far away is the water source?

1. Less than 100m
2. 100m-less than 500m
3. 500m – less than 1km
4. 1km – less than 5km
5. 5km or more
6.Not applicable

43. Whose main responsibility is it to fetch water?

Father	1
Mother	2
Son	3
Daughter	4
Relative	5
Others Specify	6

44. If you use vendor, what type of water vendor: (tick only one)

Private neighbourhood tap	*1*
Mobile vendors (water sellers)	*2*
Vendor for public water board standpipe	*3*
Not applicable	*4*

45.What one of these health facilities do you patronise?

	Tick all that apply
Government owned	1
Private clinic	2
Chemist/Pharmacy	3
Traditional/Herbal clinic	4
Other (specify).....	5

46. What were the health problems experienced by members of your household in the last 3 months?

Household Members	Health Problems Experienced	No of occurrences in 3 months
Father		
Mother		
Son		
Daughter		
Relatives		
Others		

Enumerators to use the codes

01=Tuberculosis 02=Asthma 03=Malaria 04=Rheumatic heart disease
05=High blood pressure 06=Measles 07=Hepatitis 08=Kidney problems
09=Stroke 10=Diarrhoea 11=Fever 12=Injury
13=Violence-related injury 14=Illness related to pregnancy 15=Allergies
16=Cancer 17=Diabetes 18=Mental disability
19=HIV infection 20=Physical disability (Specify)……..
21= Others specify……..

47. Which of these schools do your wards/children attend?

		Distance from home	Means of transportation
Private primary school	1		
Public primary school	2		
Private secondary school	3		
Public secondary school	4		
Others Specify	5		
Not applicable	6		

48. If any of the schools that your children go to are outside of your immediate neighbourhood, explain why:

Quality of education	1
Language	2
Cost	3
Safety	4
Moral value	5
Not Applicable	6
Other: please specify	7

49. How many children currently attend school? Number

50. How do you enjoy your leisure time?

	YES	**NO**
Watching Television	1	2
Visiting Friends and relatives	1	2
Going to sport centre	1	2
Playing music	1	2
Partying	1	2
Surfing on the internet	1	2
Reading Newspapers	1	2
Reading Novels	1	2
Other (Specify).....	1	2
Staying home	1	2
No leisure time		
None		

51. Thinking about the last 5 years, how would you say your physical safety when you are inside your home has changed, if at all? Are you safer than you were 5 years ago, about the same, or less safe than you were 5 years ago?

More [1] The same [2] Less [3]

52. Now thinking about your physical safety when you are outside the home: How does it compare with 5 years ago? Do you feel safer than 5 years ago, about the same, or less safe than 5 years ago?

More [1] The same [2] Less [3]

53. In the past 12 months, has any person in this household been a victim of violence? Yes: [1] No: [2]

54. **If YES**: I have a list of things here that could have happened to people. I am going to read the list. As I go through each one, please say that which has happened to somebody in this household in the past 12 months? **(Read from list)**

	YES	**NO**
Assault	1	2
Robbery	1	2
Sexual crime	1	2
Murder	1	2
Abduction	1	2
Religion/Communal Clashes	1	2
Other (Specify).....		

55. When you compare your situation with ten years ago, do you think you have better economic opportunities, about the same, or worse?

Better [1] The same [2] Poorer [3]

SOCIAL NETWORK

This section is focussed on the relationship of organizational membership with access to energy services and gender relations.

56 Are you a member of any organisation?

1 Yes	**2 No**

57. If YES, what type of organisation do you need to belong to, to get installation, repairs/maintenance and electricity connection?

	Installation	Repairs/ maintenance	Electrical Connection	Energy

Religious group – Christian				
Religious group – Muslim				
Religious group – Traditional				
Women's group				
Cooperative society				
Social club				
Business association				
Trade union				
Political organisation				
Street trader organisation				
Other (Specify)				

Energy – Fuel wood*, Kerosene **, Diesel *** , LPG ****, Petrol ***** ,

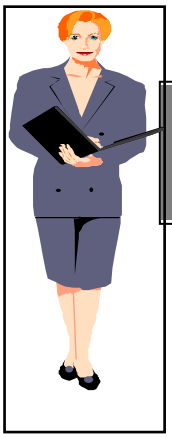
In your Household who decides over **Mark only one**

	Head of Household	Spouse	Couple	Son(s)	Daughter(s)	Other family	Other Person	Joint decision with members of the Household
58. Who should work								
59. How to spend family income								
60. Children's Education								
61. Where to Live								
62 (a) Use of Fuel								
(b) Use of Electrical Appliances								
(c) Use of cooking gadgets								
(e) Other specify								
63 Leisure Expenses								

In your household who is responsible for: **Mark only one**

	Head of Household	Spouse	Couple	Son(s)	Daughter (s)	Other family	Other Person	Joint responsibilities of member oh the household
64. Household chores								
65 Taking care of children								
66. Taking care of sick and elderly								
67.Rents and home improvements								
68. Paying for light								
69 (a) Purchase of Fuel								
(b) purchase of Electrical Appliances								
(c) Purchase of cooking gadgets								
(d) Other specify 70. Fetching Water 71. Laundry								

Appendix I (cont.)



QUESTIONNAIRE FOR ENABLING URBAN POOR LIVELIHOODS POLICY MAKING: UNDERSTANDING THE ROLE OF ENERGY SERVICES IN NIGERIA 2004

Husband or wife or senior member of household should be interviewed

QUESTIONNAIRE FOR ENTERPRISE SURVEY

Questionnaire and enumeration data:

(*Italics used for data coding only*)

Questionnaire no. (to be filled in by **data entry** persons):

Name of Community Area code (to be filled in by **enumeration supervisors**):

Name of Business (to be filled in by **enumeration supervisors**):

Address of Business (to be filled in by **enumeration supervisors**):

Enumerator's name: ID Number:

Supervisor's name: ID Number:

Date: (*e.g. code 2204*)

Time start: (*e.g. 0820*)

Time finish: (*e.g. 1540)*

SECTION A: SOCIO-DEMOGRAPHY OF ENTERPRENEUR

1. Position of respondent in the Enterprise _____

2.

A1 Gender	A2 Age of the respondent	A3 Marital Status	A4 Education	A5 Religion	A6 Tribe	A7 Nationality
Male = 1 Female = 2	Below 5 = 1 5 ↔14 = 2 15 ↔ 24 = 3 25 ↔ 34 = 4 35 ↔ 44 = 5 45 ↔ 54 = 6 55 ↔ 64 = 7 Above 64 = 8	Married = 1 Divorced = 2 Separated = 3 Widow = 4 Single = 5	None- 1 Attended pry sch = 2 Completed Pry= 3 Attended Sec sch = 4 Completed Sec = 5 Attd Higher institution = 6 Completed High inst - 7 Others ----specify = 8	Islam = 1 Christianity = 2 Traditional =3 Other Specify = 4	Yoruba = 1 Hausa = 2 Igbo = 3 Egun = 4 Gbagyi = 5 Efik/Ibibio = 6 Other Specify = 7	Nigerian = 1 Non Nigerian (West African) = 2 Non Nigerian Rest of Africa = 3 Other specify = 4

SECTION B: PROFILE OF ENTERPRISE

3. Location of Enterprise

4. Activity type

Type of the activity of the enterprise	Circle
1. Pottery	1
2. Fish processing	2
3. Fishing smoking	3
4. Fish harvesting	4
5. Pastry/Akara	5
6. Cassava processing	6

5. Is enterprise owned by

	Circle all that apply
Individual	1
Family	2
Jointly with another family (Partnership)	3
Government	4
Association	5
NGO	6
Cooperative	7
Community	8

Other (Specify)	9

6. Is enterprise registered?

1 Yes	2. No

7. If yes, with

	Circle one that apply
Local Government	1
State Government	2
Cooperative	3
Association	4
Corporate Affairs Commission	5
Other (Specify)	6

8. When did this business begin operation?

Year

9. No of persons involved in business when it first started (Including yourself)				
	Full Time		Part time	
	HH member	Paid employee	HH member	Paid employee
Female				
Male				

10. No of persons involve in business now				
	Full Time		Part time	
	HH member	Paid employee	HH member	Paid employee
Female				
Male				

11. Why was this business started? Circle ALL that apply and rank the most important reasons.

	Circle all that apply
To increase income	1
Unemployed (for more than six months)	2
Recently laid off (had a job during the past six months)	3
Family business	4
To seize business opportunity for profit	5
To work from home for childcare purposes	6
To work from home for reasons other than childcare	7
Disabled	8
Household restructuring, sickness or death in the family	9
Other (Specify)	10

12. If you are involved in other income generating activities, indicate ALL that apply and whether each provides more or less income to you than this business

Other work	Circle (O)	Comments
Formal work (i.e. in the formal sector)	1	
Part-time domestic work	2	
Work as a security guard	3	
Another informal business selling similar products elsewhere	4	
Another informal business doing something different	5	
Other (Specify)	6	
No other activities	7	

13. What were you doing before you started/took over this business? Circle ONE

Previous work	**Circle**
Scholar or student	1
Pensioner/retired person	2
Disabled person/long-term sickness	3
Unemployed	4
Employee of formal enterprise doing the same activity as	5
Employee of formal enterprise doing a different activity	6
Employee of another informal enterprise doing the same	7
Employee of another informal enterprise doing a different	8
Unpaid family worker of other enterprise	9
Owner/partner of another business	10
Self-employed farmer/fisherman/woman	11
Paid domestic worker for another household	12
Other (Specify)	13

14. **What do you use your business profits on? Circle ALL that apply and rank them in order of importance**

Use of profits	Circle (O)	Rank
Spent on myself	1	
Spent on family needs	2	
Personal savings	3	
Saved for business re-investment purposes	4	
Other (Specify)	5	

15. What are the source(s) of income for your household? Circle ALL that apply

Sources of income	**Circle**
This business	1

Formal sector wage employment in public sector (respondent)	2
Formal sector wage employment in private firm (respondent)	3
Formal sector wage employment in public sector (other	4
Formal sector wage employment in private firm (other	5
Non-agricultural business of other household members	6
Social assistance/Pension/Other benefits	7
Rent/Interest/Dividends/Savings	8
Charity/Scholarships	9
Remittances	10
Other (Specify)	11

16. What are your most important plans/intentions (not more than THREE) for the development of your business in the next three years?

Plans for development	**Circle only three**
Continue and maintain business at present size	1
Switch to another line of business	2
Move into another more profitable informal	3
Change informal business to formal business	4
Stop business and take up wage job	5
Give business to children and retire	6
Sell business and retire	7
Acquire new/better skills through training	8
Employ somebody and retire	9
Other (Specify)	10

SECTION C PRODUCTIVITY AND BUSINESS ENVIRONMENT

17. Does your business have access to the following infrastructure/facilities? Circle ALL that apply

Infrastructure/facilities	Circle (O)	No access as a constraint	Reason
Own transport	1		
Toilet	2		
Electricity	3		
Gas	4		
Water	5		
Telephone/cellphone	6		
Wood	7		
Kerosene	8		
Post box	9		
Storage facilities	10		
Shelter	11		
Farm land	12		
Fuel	13		
Charcoal	14		
Boat	15		
Good roads	16		

Other (Specify)	17		

18. Do you use the following materials/equipment in your enterprise?
(CIRCLE ALL APPLICABLE)

Materials/equipment		**Own**	**When**	**Hire**	**How * often**
Cutlass	1				
Drying mesh	2				
Grinding machine	3				
Grater	4				
Knife	5				
Fishing net	6				
Net mesh	7				
Hooks	8				
Drum stove	9				
Kiln	10				
Dryer	11				
Wheel barrow	12				
Blender	13				
Digger	14				
Shovel	15				
Frying Pan	16				
Spoon	17				
Laddle	18				
Pistle/Mortar	19				
Sieve	20				
Refrigerator/Freezer	21				
Stove	22				
Boat	23				
Other: please specify	24				

***Codes: 1. Frequently, 2. Occasionally**

	Wet Season	Dry Season
19 How many day (s) do you work in a week		
20 No of workdays lost in the last three months		
21 Average number of working hours in a day		

22. When you are not at work what else do spend your working hours for: _____

SECTION D: ENERGY USE

In this section, we shall examine the forms of energy that the enterprise use for production processes and how they affect the outputs.

23. What form of energy do you use in your enterprise?

		Quantity used/month	Cost per unit	Are you satisfied ?	Reasons
Electricity direct from NEPA	1				
Electricity from other source, e.g. generator, solar cell	2				
Electricity through informal/illegal connection	3				
Gas	4				
Paraffin/Kerosene	5				
Fuel wood	6				
Diesel	7				
Charcoal	8				
Other: Specify	9				

CODES : Yes = 1, No = 2

Enumerators: Indicate quantities with gallon (liters), cylinder (kg), bundle (kg) and bag (kg).

24. What are the main sources of energy/technologies for each of the following stages in your production processes?

25. AKARA/PASTRY

A. Grinding to flour	**B. Mixing**	**C. Heating and frying**	**D. Lighting**
Petrol grinding machine = 1, Diesel = 2, manual =3, commercial = 4	Mechanical mixer = 1, Manual = 2	Charcoal stove = 1, firewood stove = 2, Kerosene stove = 3, Gas cooker = 4	Electricity from grid = 1, Candle =2, kerosene lamp = 3, power generator = 4, Gas lamp =5,

26. Cassava Processing (FUFU)

A. Peeling of Cassava	**B. Grinding**	**C. Washing /Filtering**	**D. Heating/ cooking**	**E Lighting.**
Manua=l, Others specify= 2	Petrol grinding machine = 1, Diesel = 2, manual = 3, commercial = 4 Others _____ 5	Manual = 1, Mechanical = 2	Charcoal stove = 1, firewood stove = 2, Kerosene stove = 3, Gas cooker = 4	Electricity from grid = 1, Candle =2, kerosene lamp= 3, Gen set = 4 Gas lamp

				= 5

27. POTTERY

A. **Mixing of clay**	**B.** **Heating of clay**	**C.** **Shapening**	**D.** **Firing**	**E** **Lighting.**
Manual=l, Others specify= 2	Solar energy = 1 Gas = 2 Fuel wood = 3 Others -------- = 4	Electrical machine = 1 Others = 2	Charcoal stove = 1, firewood stove = 2, Kerosene stove = 3, Gas cooker = 4	Electricity from grid = 1, Candle =2, kerosene lamp= 3, Gen set = 4 Gas lamp = 5

28. FISH PROCESSING (Harvesting/ Smoking)

A. **Fish Harvesting**	**B.** **Cleaning, Dressing of Fish**	**C.** **Smoking of Fish**	**D** **Lighting.**
Petrol grinding machine = 1, Diesel = 2, manual = 3, commercial = 4 Others _____ 5	Manual = 1 Others Specify	Charcoal stove = 1, firewood stove = 2, Kerosene stove = 3, Gas cooker = 4	Electricity from grid = 1, Candle =2, kerosene lamp= 3, Gen set = 4 Gas lamp = 5

29. Please tick one or more of these development that have affected your enterprise.

1 High tariff of electricity
2 Increase in fuel price
3 Religious/Communal clash
4 Weather changes
5 Change in government
6 Others Specify

30. Which one of these aspects of your enterprise has been mostly affected by the above-mentioned?

7. Change in enterprise location
8. Income
9. Growth of enterprise in size
10. Availability of raw materials
11. Transportation of goods
12. Access to fuel used
13. Others (Specify)

14. None of the above

31. What were your strategies for coping?

1. Increase prices of goods and services
2. Revert to alternative fuel type (Specify)--------
3. Endure the hardship
4. Reduce the frequency of transport around
5. Take up more income earning job
6. Reduce the frequency of cooking/day
7. Others (specify) _____

32. Where do you learn about energy from?

	Tick only one
Television	1
Radio	2
Friends	3
Neighbour	4
Relatives	5
Newspapers	6
Fliers	7
Other Specify…….	8

33. What are the main problems you encounter in this enterprise due to your gender? Circle all that apply and rank the three most pressing problems in order of importance

Problems	Circle (O)	Rank
No problem at all	1	
Discrimination against women by banks when applying for loans	2	
Lack of safety from assault in your business area	3	
Pressure from spouse	4	
Difficulty finding someone to do your work during maternity	5	
Household/family duties are very time consuming and demanding	6	
Sexual harassment	7	
Other	8	

SECTION E: ACCESS TO FINANCE AND SOCIAL NETWORK

34. Do you have a bank account?

1. Yes	2. No

35. Have you benefited from any business loan

1. Yes	2. No

36. If no, do you wish to benefit from a business loan?

1. Yes	2. No

37. If yes what was your collateral

Collateral	Circle (O)
Existing business assets	1
Family asset (Vehicle, furniture etc)	2
house	3
Others	4

38. Who gave you the loan/credit? Circle ALL that apply.

Reasons	Circle (O)
Relative or friend	1
Esusu or other rotating savings and credit	2
Cooperative	3
Business association, NGO, donor project	4
Private money lender	5
Customer, contractor, middleman/agent, supplier	6
Bank	7
Government institution (Specify)	8
Others Specify	9

39. Indicate the main uses of the loan/credit (not more than THREE) in order of importance

Uses of Loan/credit		Rank
Purchase raw material/suppliers/stocks or resale goods/tools	1	
Maintaining/improving/replacing business	2	
Purchasing first or additional vehicle/transport equipment	3	
Wage/salary payments to hired workers	4	
Repayment of debts	5	
Acquisition of business share/cooperative membership	6	
Special needs of respondents or family (eg. Sickness, marriage, etc	7	
Replacement of stolen goods	8	
Personal use: paying off other loans	9	
Personal use: Building /paying off house	10	
Personal use: School fees	11	
Electrical connection	12	
Improve energy service	13	

Others (Specify)	14	

40 Which of these organisation do you belong to and does membership help your business in any way? Circle (O) ALL that apply

	Does the business benefit from membership?	
	Yes	No
Religious group – Christian	1	2
Religious group – Muslim	1	2
Women's group	1	2
Cooperative society	1	2
Social club	1	2
Business association	1	2
Trade union	1	2
Political organisation	1	2
Street trader organisation	1	2
None	1	2
Other (Specify)	1	2

41. If your business benefits from membership of any organization, how does it help you business?

Business benefits	Circle (O)
To find customers/marketing	1
Help with administration/book - keeping/record keeping	2
Help with management	3
Getting legal advice	4
Getting supplies	5
Obtaining credit	6
Access to energy	7
Information about energy	8
Others Specify	9

SECTION E GOVERNMENT'S ROLE IN INVESTMENT PROMOTION

43 What are the most important contributions that you think government can make towards promoting the profitability or growth of your business? Circle (O) ALL that apply and rank the three most important ones in order of importance

Contributions	Circle	Rank	Comments (Optional)
Safety and security on the streets	1		
Infrastructure (road maintenance, network development, electricity, water)	2		
Small business support centres (marketing, bookkeeping, etc)	3		
Improved attitude of local officials towards local residents	4		
Maintenance of high ethical standards by local government officials	5		
Help with access to credit	6		
Reduce petroleum products price	7		
Reduce NEPA tariff	8		
Reduce annual fees collected by local council	9		
Public transport	10		
Training	11		
Permanent market stores	12		
Other (Specify)	13		

FOR ENUMERATORS ONLY

43. Were any other people present during the interview? Yes: [1] No: [2]

44. If yes, how many? [ ]

45. How would you characterise the communication between yourself and the respondent: Poor [1] Fair [2] Good [3]

APPENDIX II: INDICATORS FOR HYPOTHESES

HYPOTHESIS 1

	Indicators	Data Collection	Analytical Tools
1	**Smoke** (not quantitative)	1) Observation of stove location, 2) Interview question 3) red eyes, or coughing Secondary data: e.g. own research, other research, clinics	Health Matrices
2.	**Water potability and sanitation** Sources of water supply for HHs and Enterprise e.g.. tap , vendors water pumps (does it use energy) Is boiling necessary? Sufficient fuel? Are there changes over a period of time e.g. 1, 5, 10 years (express in relation to important events)	Interview, Secondary data, Transect Walk to show where water is collected	Health Matrices, Resource Maps, Time line
3.	**Meals** HHs Storage (Do they use fridge?) Preparation (is it time saving?) cooking (Gadgets, stoves/fuel) Entrepreneurs: Where do they eat? Common diet of the target group (is there any difference? energy related? e.g. fuel, availability of time?	Interviews, secondary data	Gender tools, Health Matrices – food related eating disorder e.g. Ulcer
4.	**Working Days** Enterprise: Daily working hours, weekly and annual pattern. (If seasonal- what do they do at other times) HHs- Case Study (Livelihood Profile) How many working days lost in Last 3 months, what are the causes? Most common reason?	Interview, observation	Case studies, Livelihoods Profile Health matrices- classify energy/non energy related
5	**Perception of well being and**	Interview, observation	Case Study, livelihoods,

	productivity * Healthy to sustain one's livelihoods. Capacity to enjoy leisure, comfortable surroundings inside and outside the house, Feeling of respect (self and from others, security inclusive) Responses on physical body, psychological/emotional materials social		Ranking

HYPOTHESIS 2

	INDICATORS	DATA COLLECTION	ANALYTICAL TOOLS
1	**Involvement of community in CBOs and NGOs activities, membership in formal associations/clubs** Energy related CBOs/NGOs, Branch related CBOs/NGOs e.g.. formal associations (including government or private e.g. fishing association, Reason for involvement: non- energy (summarise) energy (detailed)	Transect Walk, Interviews: enterprise, key informants, secondary data	Social Resource mapping, graphical representation, Gender tools
2.	**Information Flow about energy Services** Which forms of energy? (factual Current Situation), Sources of information- awareness on energy services-new and existing. Knowledge of energy –forms, conversion technologies (labour saving, better efficiency), availability, suppliers, safety issues maintenance of gadgets; attitude towards energy forms and uses.	Interview, Transect Walk	Graphical, Matrix
3.	**Decision Making within Households/Enterprises** (energy forms & conversion techniques and services) What energy is used for, (don't forget human energy); who decides, who pays, who uses. i) HHs- possibly "Snap shot" survey Cooking (food processing), Lighting, entertainment ii) Enterprises - main equipment, lighting, transport (don't forget people and animals) What influenced your decision about energy technology? Where? Who? How? What are your plans for acquiring new energy gadgets in the next year? Who will make final decision? How did you learn about this?	Interviews	Case Studies/Livelihoods profile, Venn Diagrams, Gender tools

HYPOTHESIS 3:

	INDICATORS	DATA COLLECTION	ANALYTICAL TOOLS
1	**Physical variety of forms, quantity, reliability,** Variety of energy forms in use by enterprise, availability locally and nationally, quantities: not measured directly (proxy indicators, cost of energy/last week or month or year (depending on enterprise branch); reliability of supply; proxy indicator: Any stand-by systems, What influences reliability? (Natural e.g. rain, man made e.g. insufficient installed capacity); equipment in use by enterprises-energy driven (any stand by in case of energy supply disruption).	Interviews, secondary data forms, observation Transect walk	Resource Map, work activity/ energy diagram, matrices, time line (changes in form, technology price)
2	**Price:** Price of energy carrier (official price, price paid by enterprise, subsidy availability) conversion technology- subsidy available? Changes in the last 5, and 10 years, influence of energy on enterprises commodity/services; have other input prices changed more than energy cost if yes, which?	Interviews, Secondary data	Time lines, graphical presentation, income and expenditure calendar (case Study)
3	**Repairs timely, availability of spare parts**: Availability of spares. Service agent e.g. who supplies the fish drying mesh, wherefrom, location.		
4	**service provider's perception of the end user (entrepreneurs)**: Market opportunities/ assessment criteria; reliable payers (customers), Too dangerous (risk)	Interview by key informants, documents or the principle of service provider	Policy Analysis
5	**Sustainable enterprise:** Ability to withstand shock, meets required needs, provides quality service	Interview,	
6	**End user's (entrepreneur) perception of energy service.** Available, affordable,	Interview of key informant	

HYPOTHESIS 4

Energy Sector reforms lead to improved access to Clean and affordable energy services by enterprises.

1	**Financial Mechanism**: To facilitate access to clean energy forms. Fuel switching, more efficient technology * Types of mechanisms (See if this is focusing on energy or enterprises) Subsidies, cheap loans, tax breaks, credit (micro) grants, rotating funds. Who?- Govt, Donors, NGOs, Banks etc. * Are entrepreneurs aware of opportunities?	Secondary data, Key informant interview	Matrices, Policy analysis, case studies, time line (macro level)
2	**New Policies in Place; and consideration of enterprises and energy;** Tariff Reforms, pricing, Regulations (factual, How do these affect the enterprises and energy?) Perceptions (entrepreneur awareness)	Secondary data, Key informant interview from govt. agent and entrepreneurs	Policy Analysis, Gender Analysis, Time Line at macro level, livelihoods profile NB: Are policies facilitating access to clean energy forms?
3	Expansion of Service delivery by i) existing supplier ii) New suppliers enter market. Area covered, types of services (Fuels / technology /repairs / facilitation) local technicians and agents, formal and informal. NB Facilitation such as selling batteries, illegal: connection, electricity hook-up, stolen goods, legal: credit vouchers, connection orders	Transect Walk, Interviews- Supplier, entrepreneurs	Resource map, Time line
4	**Quality of Services**: Entrepreneur perception: * Affordable, Reliable, Clean, Matches needs (defined by entrepreneurs). Have services improved over time?	Interviews	Fuel Ranking, Time line

APPENDIX III: TABLES OF DATA COLLECTED BY THE SURVEY

TABLE A1.1

FORMS OF ENERGY USED

Form of Energy	Ilaje		Amukoko		Kwali		Karmo		Total
	COUNT	%	COUNT	%	COUNT	%	COUNT	%	
NEPA	105	27.8	103	27.2	87	23	83	22	378
Other Electricity Sources	8	18.2	6	13.6	7	15.9	23	52.3	44
Illegal Connection from NEPA	3	27.3	2	18.2	3	27.3	3	27.3	11
Gas	5	23.8	0	0	1	4.8	15	71.4	21
Kerosene	117	31.8	87	23.6	79	21.5	85	23.1	368
Diesel	4	57.1	0	0	2	28.6	1	14.3	7
Fuel wood	16	13.4	13	10.9	61	51.3	29	24.4	119
Charcoal	14	26.4	15	28.3	10	18.9	14	26.4	53
Others	2	66.7	0	0	1	33.3	0	0	3

TABLE A1.2

MAJOR PROBLEMS WITH ELECTRICITY SUPPLY

Major problem with electricity	Ilaje		Amukoko		Kwali		Karmo		Total	Percent
	COUNT	%	COUNT	%	COUNT	%	COUNT	%		
High tariff/rate	30	21.1	59	41.6	9	6.3	44	31	142	33.73
Lack of maintenance	21	42	9	18	6	12	14	28	50	11.88
Irregular supply	76	33.2	41	18	78	34.1	34	14.9	229	54.39

TABLE A1.3

AMOUNT PAID FOR ELECTRICITY

Amount(₦)	COMMUNITY				Total
	Ilaje	Amukoko	Kwali	Karmo	
	No of respondents	No of respondents	No of respondents	No of respondents	
100 – 500	54	71	14	23	162
501 – 1000	29	18	27	16	90
1001 – 1500	7	7	18	5	37
1501- 2000	13	5	8	14	40
2001 – 2500	5	1	4	7	17
2501 – 3000	5	3	4	5	17

TABLE A1.4a

MAIN SOURCES OF ENERGY FOR END-USE

Community	Grinding							
	Electricity	%	Kerosene	%	Petrol	%	Manual	%
Ilaje	9	13.6	2	66.7	0	0	30	33.0
Amukoko	17	25.8	0	0.0	0	0	13	14.3
Kwali	2	3.0	0	0.0	0	0	24	26.4
Karmo	38	57.6	1	33.3	6	100	24	26.4
Total	66	100.0	3	100.0	6	100	91	100.0

TABLE A1.4b

Community	Washing				Entertainment							
	Electricity	%	Manual	%	Electricity	%	Car battery	%	Power generator	%	Manual	%
Ilaje	0	0	44	30.3	50	22.7	0	0	1	14.3	0	0
Amukoko	0	0	48	33.1	83	37.7	0	0	1	14.3	0	0
Kwali	0	0	21	14.5	29	13.2	1	50	0	0.0	0	0
Karmo	6	100	32	22.1	58	26.4	1	50	5	71.4	1	100
Total	6	100	145	100.0	220	100.0	2	100	7	100.0	1	100

TABLE A1.5a

ENERGY TECHNOLOGIES USED FOR HH ACTIVITIES

Community	Lighting								Cooking					
	Rechargelamp	%	Electric bulb	%	Candle	%	Other	%	Kerosene stove	%	Gas cooker	%	Charcoal stove	%
Ilaje	0	0.0	131	34.3	0	0	0	0.0	128	30.5	2	20	0	0
Amukoko	9	24.3	89	23.3	2	50	6	85.7	106	25.3	3	30	3	75
Kwali	3	8.1	90	23.6	1	25	1	14.3	96	22.9	0	0	0	0
Karmo	25	67.6	72	18.8	1	25	0	0.0	89	21.2	5	50	1	25
Total	37	100.0	382	100.0	4	100	7	100.0	419	100.0	10	100	4	100

TABLE A1.5b

Community	Boiling drinking water											
	Kerosene stove	%	Gas cooker	%	Water boiler	%	Electric kettle	%	Charcoal stove	%	Other	%
Ilaje	90	35.4	1	16.7	5	22.7	2	12.5	0	0	0	0
Amukoko	48	18.9	1	16.7	17	77.3	3	18.8	3	100	2	100
Kwali	65	25.6	0	0.0	0	0.0	7	43.8	0	0	0	0
Karmo	51	20.1	4	66.7	0	0.0	4	25.0	0	0	0	0
Total	254	100.0	6	100.0	22	100.0	16	100.0	3	100	2	100

TABLE A1.6

PREFERRED ENERGY TECHNOLOGY FOR COOKING

Preferred Energy Technology	Ilaje		Amukoko		Kwali		Karmo		Total
	COUNT	%	COUNT	%	COUNT	%	COUNT	%	
Kerosene	71	47.3	41	27.3	25	16.7	25	16.7	150
Gas cooker	42	28.8	42	28.8	29	19.9	29	19.9	146
Fuel wood	1	10.0	0	0.0	9	90.0	9	90.0	10
Charcoal stove	2	18.2	2	18.2	4	36.4	4	36.4	11
Electric cooker	12	9.4	26	20.5	30	23.6	30	23.6	127
Others	1	100.0	0	0.0	0	0.0	0	0.0	1

TABLE A1.7

AVERAGE TIME FOR COOKING MEALS

Average Time (Minutes)	Ilaje		Amukoko		Kwali		Karmo		Total
	COUNT	%	COUNT	%	COUNT	%	COUNT	%	
1 – 30	27	36.0	24	32.0	5	6.7	19	25.3	75
31 – 60	83	34.0	54	22.1	46	18.9	61	25.0	244
61 – 90	9	20.5	7	15.9	19	43.2	9	20.5	44
91 – 120	14	17.5	33	41.3	24	30.0	9	11.3	80
121 – 150	1	25.0	0	0.0	1	25.0	2	50.0	4
151 – 180	0	0.0	2	50.0	2	50.0	0	0.0	4

TABLE A1.8a

SOURCES OF WATER USED MOST OFTEN

Community	Piped internal /yard tap		Water Tanker/carrier		Piped public tap paid for		Borehole (Manual)		Borehole (Pump)		Well (non borehole)	
	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	
Ilaje	18	38.3	2	8.7	24	31.2	14	28.6	70	54.3	2	4.9
Amukoko	6	12.8	3	13.0	41	53.2	2	4.1	5	3.9	0	0.0
Kwali	3	6.4	1	4.3	1	1.3	26	53.1	30	23.3	31	75.6
Karmo	20	42.6	17	73.9	11	14.3	7	14.3	24	18.6	8	19.5
Total	47	100.0	23	100.0	77	100.0	49	100.0	129	100.0	41	100.0

TABLE A1.8b

SOURCES OF WATER FOR DRINKING

Community	Piped internal /yard tap		Water Tanker/ carrier		Piped public tap paid for		Borehole (Manual)		Borehole (Pump)		Well (non borehole)	
	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	
Amukoko	10	22.2	4	17.4	78	70.3	5	10.2	13	8.9	0	0.0
Kwali	2	4.4	1	4.3	2	1.8	25	51.0	33	22.6	28	68.3
Karmo	18	40.0	16	69.6	11	9.9	6	12.2	24	16.4	11	26.8
Total	45	100.0	23	100.0	111	100.0	49	100.0	146	100.0	41	100.0

TABLE A1.8c SOURCES OF WATER USED FOR BATHING

source of water for bathing	Name of Community				Total
	Ilaje	Amukoko	Kwali	Karmo	
piped-internal	5	2	0	8	15
piped-yard tap	12	3	0	2	17
water carrier/tanker	2	2	1	7	12
piped-public tap/kiosk(free)	0	0	0	1	1
piped-public tap/kiosk(paid for)	16	26	1	8	51
borehole (manual)	14	7	23	10	54
borehole with pumps	71	14	23	21	129
rainwater tank	0	2	0	8	10
flowing river/stream	3	0	3	1	7
dam/stagnant water	1	1	1	1	4
well (non-borehole)	7	55	45	32	139
Other	0	1	0	0	1
Total	131	113	97	99	440

TABLE A1.8d

SOURCES OF WATER FOR COOKING

Community	Piped internal /yard tap		Water Tanker /carrier		Piped public tap paid for		Borehole (Manual)		Borehole (Pump)		Well (non borehole)	
	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	
Ilaje	16	47.1	2	14.3	17	18.5	13	26.5	77	55.4	5	5.7
Amukoko	7	20.6	3	21.4	64	69.6	7	14.3	14	10.1	13	14.9
Kwali	1	2.9	1	7.1	2	2.2	21	42.9	27	19.4	40	46.0
Karmo	10	29.4	8	57.1	9	9.8	8	16.3	21	15.1	29	33.3
Total	34	100.0	14	100.0	92	100.0	49	100.0	139	100.0	87	100.0

TABLE A1.8e

SOURCES OF WATER FOR WASHING

Community	Piped internal /yard tap		Water Tanker /carrier		Piped public tap paid for		Borehole (Manual)		Borehole (Pump)		Well (non borehole)	
	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	
Ilaje	16	18.2	2	18.2	13	31.0	14	26.4	73	56.6	8	5.4
Amukoko	5	16.1	2	18.2	20	47.6	8	15.1	12	9.3	63	42.9
Kwali	0	0.0	1	9.1	1	2.4	22	41.5	23	17.8	45	30.6
Karmo	10	32.3	6	54.5	8	19.0	9	17.0	21	16.3	31	21.1
Total	31	100.0	11	100.0	42	100.0	53	100.0	129	100.0	147	100.0

TABLE A1.9 PROBLEMS ENCOUNTERED WITH WATER SUPPLY IN THE SELECTED COMMUNITIES

Problems encountered with water supply	Ilaje		Amukoko		Kwali		Karmo		Total
	COUNT	%	COUNT	%	COUNT	%	COUNT	%	
Poor quality	30	17.8	45	26.6	47	27.8	47	27.8	169
Unexpected interruption-daily	4	20.0	3	15.0	6	30.0	7	35.0	20
Unexpected interruption-occasionally	11	16.2	12	17.7	21	30.9	24	35.3	68
Inaccurate bill	12	28.6	14	33.3	6	14.3	10	23.8	42
Too far/ Inconvenient to fetch	28	45.2	8	12.9	16	25.8	10	16.1	62

TABLE A1.10 DISTANCE FROM WATER IN SELECTED COMMUNITIES

Distance (Meters)	Ilaje		Amukoko		Kwali		Karmo		Total
	COUNT	%	COUNT	%	COUNT	%	COUNT	%	
0 – 100m	67	25.5	69	26.2	63	24.0	64	24.3	263
100 – 500m	31	31.0	25	25.0	19	19.0	25	25.0	100
501 – 1000m	10	50.0	3	15.0	4	20.0	3	15.0	20
1001 – 5000m	10	66.7	1	6.7	4	26.7	0	0.0	15
> 5000	1	12.5	3	37.5	4	50.0	0	0.0	8

TABLE A1.11 PATRONAGE OF HEALTH FACILITIES BY SELECTED COMMUNITIES

Health Facility	Ilaje		Amukoko		Kwali		Karmo		Total
	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT
Government	71	28.2	23	14.3	46	27.9	68	34.7	208
Private	84	33.5	75	46.6	58	35.2	67	34.2	284
Chemist/Pharmacy	64	25.4	33	20.5	35	21.2	53	27.0	175
Traditional/Herbal clinic	33	13.2	30	18.6	26	15.7	8	0.1	97

TABLE A1.12 MAJOR HEALTH PROBLEMS FACED BY HOUSEHOLD MEMBERS

	Father					Mother					Son					Daughter				
Community	Malaria	Fever	HBP	Diarrhoea	others	Malaria	Fever	HBP	Diarrhoea	others	Malaria	Fever	HBP	Diarrhoea	others	Malaria	Fever	HBP	Diarrhoea	others
Ilaje	16	10	2	1	8	25	12	5	2	11	32	9	0	0	9	27	6	0	0	7
Amukoko	21	9	4	0	3	25	11	1	0	9	25	10	0	0	9	19	12	0	0	10
Kwali	33	5	0	1	5	30	6	1	1	9	28	4	0	0	7	25	8	1	0	5
Karmo	7	5	0	3	7	12	3	1	0	5	26	7	0	1	7	25	4	0	0	9
Total	77	29	6	5	23	92	32	8	3	34	111	30	0	1	32	96	30	1	0	31

TABLE A1.13 LEISURE ACTIVITIES

Comm Unity	TV		Visit Friends		Visit Sport centre		Listen to music		Party		Internet surfing		Reading news paper		Reading novels		Staying at home		No leisure	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Ilaje	68	25.9	61	30	6	9.4	37	28	15	48.4	7	16.7	31	26.7	23	29.9	92	40.9	6	31.6
Amu Koko	56	21.3	23	11.3	4	6.3	21	15.9	4	12.9	7	16.7	17	14.7	12	15.6	56	24.9	10	52.6
Kwali	63	24	50	24.6	27	42.2	28	21.2	1	3.2	9	21.4	28	24.1	25	32.5	27	12	2	10.5
Karmo	76	28.9	69	34	27	42.2	46	34.8	11	35.5	19	45.2	40	34.5	17	22.1	50	22.2	1	5.3
Total	263	100	203	100	64	100	132	100	31	100	42	100	116	100	77	100	225	100	19	100

TABLE A1.14 PHYSICAL SAFETY OF COMMUNITY MEMBERS WITHIN AND OUTSIDE THE HOME

Community	Within the home						Outside the home					
	More		Same		Less		More		Same		Less	
	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%
Ilaje	62	44.0	45	28.7	25	17.5	34	28.6	59	37.6	40	24.0
Amukoko	28	19.9	39	24.8	47	32.9	27	22.7	40	25.5	48	28.7
Kwali	25	17.7	36	22.9	34	23.8	25	21.0	30	19.1	41	24.6
Karmo	26	18.4	37	23.6	37	25.9	33	27.7	28	17.8	38	22.8
Total	141	100.0	157	100.0	143	100.0	119	100.0	157	100.0	167	100.0

TABLE A1.15 RESPONSES OF COMMUNITIES ON ECONOMIC OPPORTUNITIES BETWEEN 1994 – 2004

Community	Better		Same		Poorer	
	COUNT	%	COUNT	%	COUNT	%
Ilaje	50	30.7	6	8.3	77	37.4
Amukoko	20	12.3	11	15.3	83	40.3
Kwali	53	32.5	18	25.0	24	11.7
Karmo	40	24.5	37	51.4	22	10.7
Total	163	100.0	72	100.0	206	100.0

Table A2.1 Membership of any organization

	Name of Community				Total
	Ilaje	Amukoko	Kwali	Karmo	
Yes	74	24	64	79	241
No	55	85	25	15	180
	129	109	89	94	421

TABLE A2.2a TYPE OF ORGANISATION HH MEMBERS NEED TO BELONG TO GET INSTALLATION

	Type of Organisation													
Community	Christian group	%	Muslim group	%	Traditional group	%	Coop society	%	Social club	%	Business association	%	Others	%
Ilaje	27	38	11	29.7	0	0	3	15	4	24	1	10	37	72.5
Amukoko	5	6.9	0	0	0	0	1	5	1	5.9	0	0	2	3.9
Kwali	29	40	15	40.5	2	100	7	35	4	24	6	60	3	5.9
Karmo	11	15	11	29.7	0	0	9	45	8	47	3	30	9	17.6
Total	72	100	37	100	2	100	20	100	17	100	10	100	51	100

Table A2.2b REPAIRS / MAINTENANCE

Community	Christian group	%	Muslim group	%	Traditional group	%	Coop society	%	Social club	%	Business association	%	Others	%
Ilaje	2	15.4	1	7.7	0	0	0	0.0	1	10	2	33	2	25
Amukoko	4	30.8	0	0.0	0	0	1	6.7	0	0	0	0	3	38
Kwali	6	46.2	7	53.8	1	100	6	40.0	3	30	3	50	2	25
Karmo	1	7.7	5	38.5	0	0	8	53.3	6	60	1	17	1	13
Total	13	100	13	100	1	100	15	100	10	100	6	100	8	100

TABLE A2.2c ELECTRICAL CONNECTION

Community	Christian group	%	Muslim group	%	Traditional group	%	Coop society	%	Social club	%	Business association	%	Others	%
Ilaje	1	9.1	1	12.5	0	0	0	0.0	2	18.2	0	0	1	14.3
Amukoko	4	36.4	0	0.0	0	0	1	8.3	0	0.0	0	0	3	42.9
Kwali	5	45.5	3	37.5	1	100	4	33.3	2	18.2	3	75	2	28.6
Karmo	1	9.1	4	50.0	0	0	7	58.3	7	63.6	1	25	1	14.3
Total	11	100	8	100	1	100	12	100	11	100	4	100	7	100

Table A2.2d ENERGY

Community	Christian group	%	Muslim group	%	Traditional group	%	Coop society	%	Social club	%	Business association	%	Others	%
Ilaje	0	0.0	0	0.0	0	0	0	0.0	0	0	0	0	2	40
Amukoko	3	33.3	0	0.0	0	0	1	8.3	0	0	0	0	0	0
Kwali	5	55.6	3	42.9	1	100	4	33.3	2	22	3	75	2	40
Karmo	1	11.1	4	57.1	0	0	7	58.3	7	78	1	25	1	20
Total	9	100	7	100	1	100	12	100	9	100	4	100	5	100

TABLE A2.3 SOURCES OF INFORMATION ABOUT SOURCES OF ENERGY

Community	Television	%	Radio	%	Friends	%	Neighbour	%	Relatives	%	Newspaper	%	Others	%
Ilaje	15	15.8	19	26.4	19	31.1	32	55.2	7	20.6	10	45.5	25	37.9
Amukoko	34	35.8	13	18.1	6	9.8	9	15.5	10	29.4	1	4.5	29	43.9
Kwali	27	28.4	30	41.7	9	14.8	10	17.2	12	35.3	8	36.4	1	1.5
Karmo	19	20.0	10	13.9	27	44.3	7	12.1	5	14.7	3	13.6	11	16.7
Total	95	100	72	100	61	100	58	100	34	100	22	100	66	100

TABLE A2.4a NUMBER OF RESPONDENTS THAT ARE WILLING TO BUY ENERGY FROM THIRD PARTY AND WHY

Community	Number of request	%	Price	%	Reliability	%	Availability	%	Others	%
Ilaje	31	23.0	20	22.0	46	29.7	18	39.1	22	53.7
Amukoko	33	24.4	33	36.3	20	12.9	7	15.2	10	24.4
Kwali	28	20.7	15	16.5	33	21.3	18	39.1	7	17.1
Karmo	43	31.9	23	25.3	56	36.1	3	6.5	2	4.9
Total	135	100	91	100	155	100	46	100	41	100

TABLE A2.4b REASONS FOR NOT WILLING TO SWITCH

Community	Number of respondents that said no	%	High Price	%	Non availability	%	Price unknown	%	No knowledge of service quality	%
Ilaje	97	33.3	17	32.7	74	36.8	2	33.3	12	17.1
Amukoko	80	27.5	7	13.5	30	14.9	2	33.3	27	38.6
Kwali	65	22.3	14	26.9	42	20.9	2	33.3	19	27.1
Karmo	49	16.8	14	26.9	55	27.4	0	0.0	12	17.1
Total	291	100	52	100	201	100	6	100	70	100

TABLE A2.5a REASONS FOR NOT WILLING TO SWITCH WHO DOES ELECTRICAL INSTALLATION

Community	Professional technician	%	Electrician	%	Member of household	%	Self	%	others	%
Ilaje	40	25.8	30	23.6	1	20	0	0	2	33.3
Amukoko	46	29.7	41	32.3	0	0	2	40	1	16.7
Kwali	44	28.4	13	10.2	0	0	1	20	2	33.3
Karmo	25	16.1	43	33.9	4	80	2	40	1	16.7
Total	155	100	127	100	5	100	5	100	6	100

TABLE A2.5b ELECTRICAL REPAIRS

Community	Professional technician	%	Electrician	%	Member of household	%	Self	%	others	%
Ilaje	30	21.4	97	38.8	2	14.3	1	9.1	1	16.7
Amukoko	26	18.6	83	33.2	2	14.3	4	36.4	1	16.7
Kwali	50	35.7	14	5.6	6	42.9	2	18.2	3	50.0
Karmo	34	24.3	56	22.4	4	28.6	4	36.4	1	16.7
Total	140	100	250	100	14	100	11	100	6	100

TABLE A2.6a DECISION ON THE USE OF FUEL

COMMUNITY	Head				Spouse				Couple				Son		Daughter		Joint decision				TO	
	M	%	F	%	M	%	F	%	M	%	F	%	M	%	F	%	M	%	F	%	**M**	**%**
Ilaje	39	*67.2*	13	*76.5*	12	*20.69*	2	*11.76*	4	*6.9*	1	*5.9*	0	*0*	1	*5.9*	3	*5.17*	0	*0*	**58**	***77.***
Amukoko	27	*57.4*	6	*54.5*	12	*25.53*	4	*36.36*	5	*11*	1	*9.1*	3	*6.4*	0	*0*	3	*6.38*	0	*0*	**47**	***8***
Kwali	35	*59.3*	10	*34.5*	17	*28.81*	10	*34.48*	0	*0*	1	*3.4*	0	*0*	1	*3.4*	7	*11.9*	7	*24*	**59**	***6***
Karmo	26	*33.3*	9	*60*	15	*19.23*	2	*13.33*	34	*44*	4	*27*	1	*1.3*	0	*0*	2	*2.56*	0	*0*	**78**	***83.***
ALL	**127**	***52.5***	**38**	***52.8***	**56**	***23.14***	**18**	***25***	**43**	***18***	**7**	***9.7***	**4**	***1.7***	**2**	***2.8***	**15**	***6.2***	**7**	***9.7***	**242**	***7***

Table 2.6b
DECISION ON THE USE OF COOKING GADGETS

COMMUNITY	Head				spouse				Couple				Son		Daughter		Joint d	
	M	%	F	%	M	%	F	%	M	%	F	%	M	%	F	%	M	%
Ilaje	21	*30.43*	14	*51.85*	36	*52.2*	8	*29.63*	5	*7.25*	1	*3.7*	0	*0*	0	*0*	7	*10.14*
Amukoko	20	*30.3*	7	*53.85*	35	*53*	3	*23.08*	2	*3.03*	0	*0*	3	*4.5*	1	*7.7*	6	*9.091*
Kwali	16	*28.57*	3	*10.34*	31	*55.4*	20	*68.97*	1	*1.79*	0	*0*	0	*0*	1	*3.4*	8	*14.29*
Karmo	11	*14.29*	5	*35.71*	35	*45.5*	7	*50*	28	*36.4*	1	*7.14*	1	*1.3*	0	*0*	2	*2.597*
TOTAL	**68**	***25.37***	**29**	***34.94***	**137**	***51.1***	**38**	***45.78***	**36**	***13.4***	**2**	***2.41***	**4**	***1.5***	**2**	***2.4***	**23**	***8.582***

TABLE A2.6c DECISION ON THE USE OF ELECTRICAL APPLIANCES

COMMUNITY	Head				Spouse				Couple				Son		Daughter		Joint decision				**To**	
	M	%	F	%	M	%	F	%	M	%	F	%	M	%	F	%	M	%	F	%	**M**	**%**
Ilaje	47	*62.67*	15	*50*	5	*6.7*	4	*13.33*	12	*16*	1	*3.33*	0	*0*	3	*10*	11	*14.7*	7	*23.3*	**75**	***71.43***
Amukoko	36	*57.14*	10	*66.67*	8	*12.7*	3	*20*	9	*14.3*	0	*0*	0	*0*	0	*0*	10	*15.9*	2	*13.3*	**63**	***80.77***
Kwali	30	*53.57*	14	*53.85*	6	*10.7*	2	*7.692*	1	*1.79*	0	*0*	1	*1.8*	0	*0*	18	*32.1*	10	*38.5*	**56**	***68.29***
Karmo	26	*33.33*	10	*66.67*	9	*11.5*	2	*13.33*	40	*51.3*	1	*6.67*	0	*0*	0	*0*	3	*3.8*	2	*13.3*	**78**	***83.87***
TOTAL	**139**	***51.1***	**49**	***56.98***	**28**	***10.3***	**11**	***12.79***	**62**	***22.8***	**2**	***2.33***	**1**	***0.4***	**3**	***3.5***	**42**	***15.4***	**21**	***24.4***	**272**	**76.0**

TABLE A 2.6d WHO PAYS FOR LIGHT

COMMUNITY	Head				Spouse				Couple				Son		Daughter		Joint decision				**Total**			
	M	%	F	%	M	%	F	%	M	%	F	%	M	%	F	%	M	%	F	%	**M**	**%**	**F**	**%**
Ilaje	83	*88.3*	21	*67.74*	3	*3.19*	5	*16.13*	4	*4.26*	2	*6.45*	0	*0*	1	*3.2*	4	*4.255*	2	*6.45*	**94**	***75.2***	**31**	***24.8***
Amukoko	66	*91.67*	11	*64.71*	2	*2.78*	4	*23.53*	3	*4.17*	1	*5.88*	0	*0*	0	*0*	1	*1.389*	0	*0*	**72**	***80.9***	**17**	***19.1***
Kwali	51	*92.73*	28	*82.35*	1	*1.82*	0	*0*	0	*0*	0	*0*	1	*1.8*	1	*2.9*	2	*3.636*	5	*14.7*	**55**	***61.8***	**34**	***38.2***
Karm	6	*88*	1	*68*	3	*3.*	3	*18*	6	*7.*	1	*6.*	0	*0*	0	*0*	0	*0*	1	*6.*	**7**	***82***	**1**	***17***

o	8	*.31*	1	*.75*		*9*		*.75*		*79*		*25*								*25*	**7**	***.8***	**6**	***.2***
TOTAL	**268**	***89.93***	**71**	***72.45***	**9**	***3.02***	**12**	***12.24***	**13**	***4.36***	**4**	***4.08***	**1**	***0.3***	**2**	***2***	**7**	***2.349***	**8**	***8.16***	**298**	**75.3**	**98**	**24.7**

TABLE A2.6e PURCHASE OF FUEl

COM	Head				spouse				Couple				Son		Daughter		Joint decision				**Total**			
	M	%	F	%	M	%	F	%	M	%	F	%	M	%	F	%	M	%	F	%	**M**	**%**	**F**	**%**
Ilaje	41	*70.57*	12	*70.59*	10	*17.2*	2	*11.76*	5	*8.62*	0	*0*	0	*0*	1	*5.9*	2	*3.4*	2	*11.8*	**58**	***77.33***	**17**	***22.7***
Amukoko	32	*71.11*	5	*41.67*	9	*20*	4	*33.33*	2	*4.44*	0	*0*	1	*2.2*	2	*17*	1	*2.2*	1	*8.3*	**45**	***78.95***	**12**	***21.1***
Kwali	41	*71.9*	16	*53.33*	9	*15.8*	6	*20*	0	*0*	0	*0*	1	*1.8*	0	*0*	6	*10.5*	8	*26.7*	**57**	***65.52***	**30**	***34.5***
Karmo	63	*81.8*	12	*75*	4	*5.19*	3	*18.75*	10	*13*	1	*6.25*	0	*0*	0	*0*	0	*0.0*	0	*0.0*	**77**	***82.8***	**16**	***17.2***
TOTAL	**177**	*74.7*	**45**	*60*	**32**	*13.5*	**15**	*20*	**17**	*7.17*	**1**	*1.33*	**2**	*0.8*	**3**	*4*	**9**	*3.8*	**11**	*14.7*	**237**	***75.96***	**75**	***24***

TABLE A2.6f PURCHASE OF ELECTRICAL APPLIANCES

COMM	Head				spouse				Couple				Son		Dau		Joint decision				**Total**			
	M	%	F	%	M	%	F	%	M	%	F	%	M	%	F	%	M	%	F	%	**M**	**%**	**F**	**%**
Ilaje	62	*84.9*	18	*72*	3	*4.1*	4	*16*	4	*5.5*	0	*0*	1	*1.4*	0	*0*	3	*4.1*	3	*12.0*	**73**	***74.49***	**25**	***25.5***
Amu	50	*83.3*	8	*66.7*	4	*6.7*	4	*33.3*	4	*6.7*	0	*0*	0	*0*	0	*0*	2	*3.3*	0	*0.0*	**60**	***83.33***	**12**	***16.7***
Kwali	47	*81.0*	17	*62.9*	1	*1.7*	1	*3.7*	0	*0*	0	*0*	1	*1.7*	1	*3.7*	8	*13.8*	8	*29.6*	**58**	***68.24***	**27**	***31.8***
Kar	62	*82.7*	10	*62.5*	3	*4*	4	*25*	10	*13.3*	1	*6.25*	0	*0*	0	*0*	0	*0*	1	*6.3*	**75**	***82.42***	**16**	***17.6***
TOTAL	**221**	*83.1*	**53**	*66.3*	**11**	*4.1*	**13**	*16.3*	**18**	*6.8*	**1**	*1.25*	**2**	*0.8*	**1**	*1.3*	**13**	*4.9*	**12**	*15.0*	**266**	***76.88***	**80**	***23.1***

TABLE A 2.6g PURCHASE OF COOKING GADGETS

COMM M	Head				spouse				Couple				Son		Daughter		Joint decision				**Total**			
	M	%	F	%	M	%	F	%	M	%	F	%	M	%	F	%	M	%	F	%	**M**	**%**	**F**	**%**
Ilaje	34	*51.5*	14	*63.6*	22	*33.3*	7	*31.8*	7	*10.6*	0	*0.0*	0	*0*	1	*4.5*	3	*4.5*	0	*0*	**66**	***75***	**22**	***25***
Amu	27	*45.8*	6	*46.2*	26	*44.1*	6	*46.2*	4	*6.8*	7	*53.8*	0	*0*	0	*0*	2	*3.4*	1	*7.6*	**59**	***81.94***	**13**	***18.1***
Kwali	21	*41.2*	3	*12.5*	23	*45.1*	14	*58.3*	0	*0*	0	*0.0*	0	*0*	1	*4.2*	7	*13.7*	6	*25*	**51**	***68***	**24**	***32***
Karmo	45	*60.8*	4	*25.0*	32	*43.2*	9	*56.3*	7	*9.5*	3	*18.8*	0	*0*	0	*0*	0	*0.0*	0	*0*	**74**	***82.22***	**16**	***17.8***
TOT	**127**	*50.8*	**27**	*36.0*	**103**	*41.2*	**36**	*48*	**18**	*7.2*	**10**	*13.3*	**0**	*0*	**2**	*2.7*	**12**	*4.8*	**7**	*9.3*	**250**	***76.92***	**75**	***23.1***

TABLE A 3.1 FORMS OF ENERGY USED BY ENTERPRISE

Enterprise	Electricity (NEPA)	%	Electricity (other source)	%	Gas	%	Kerosene	%	Fuel wood	%	Charcoal	%	Diesel	%	others	%
Pottery	3	42.9	0	0.0	0	0.0	8	25.0	9	15.8	3	25.0	0	0.0	0	0
Fish processing	1	14.3	1	50.0	2	40.0	15	46.9	32	56.1	5	41.7	0	0.0	13	100
Pastry/ Akara	3	42.9	1	50.0	3	60.0	2	6.3	7	12.3	1	8.3	1	50.0	0	0
Cassava processing	0	0.0	0	0.0	0	0.0	7	21.9	9	15.8	3	25.0	1	50.0	0	0
Total	7	100	2	100.0	5	100.0	32	100	57	100	12	100	2	100	13	100

TABLE A3.2 DEVELOPMENT THAT AFFECTS THE ENTERPRISES

Enterprise/ Development that have affected your enterprise	Pottery	%	Cassava processing	%	Fish processing	%	Pastry Akara	%	Total
Electricity high tariff	9	30.0	8	26.7	14	46.7	8	26.7	30
Increase in fuel price	15	16.0	18	19.1	61	64.9	15	16.0	94

Religious communal clash	0	0.0	1	9.1	8	72.7	2	18.2	11
Weather changes	15	36.6	2	4.9	37	90.2	2	4.9	41
Change in government	8	21.1	5	13.2	29	76.3	4	10.5	38
Others	3	18.8	13	81.3	1	6.3	2	12.5	16

TABLE A3.3 COPING STRATEGIES

strategies for coping	Activity				
	pottery	fish processing	pastry/akara	cassava processing	Total
increase prices of goods and services	13	27	9	6	55
revert to alternative fuel type	3	5	1	0	9
endure the hardship	5	37	5	11	58
reduce the frequency of transport around	3	5	0	1	9
take up more income earning job	1	4	0	1	6
reduce the frequency of cooking/day	0	1	2	1	4
other	0	0	1	0	1

TABLE A3.4 SOURCE OF INFORMATION BY ACTIVITY

Source of information	Pottery		Fish processing		Pastry Akara		Cassava processing		**Total**	
	Count	%	Count	%	Count	%	Count	%	**Count**	**%**
Television	2	8	8	11	2	12.5	1	5	**13**	**10**
Radio	5	20	10	14	3	18.75	3	15	**21**	**16**
Friends	6	24	14	20	4	25	4	20	**28**	**21**
Neighbour	6	24	19	27	2	12.5	5	25	**32**	**24**
Relatives	5	20	10	14	2	12.5	4	20	**21**	**16**
Newspaper	1	4	1	1	0	0	0	0	**2**	**2**
Fliers	0	0	0	0	0	0	1	5	**1**	**1**
Others	0	0	8	11	3	18.75	2	10	**13**	**10**
Total	**25**	**100**	**70**	**100**	**16**	**100**	**20**	**100**	**131**	**100**

TABLE A 4.1 ENTERPRISES AFFECTED BY SHOCKS

	Changes in market location	%	Income	%	Growth of enterprise in size	%	Raw material availability	%	Transportation of goods	%	Access to fuel use	%	None of the above/Others	%	Total
Pottery	1	4.2	12	50.0	4	16.7	2	8.3	4	16.7	0	0.0	1	4.2	24
Fish processing	2	2.6	38	48.7	18	23.1	5	6.4	9	11.5	5	6.4	1	1.3	78
Pastry/ Akara	0	0.0	7	41.2	6	35.3	1	5.9	0	0.0	3	17.6	0	0.0	17
Cassava processing	0	0.0	9	45.0	4	20.0	3	15.0	3	15.0	1	5.0	0	0.0	20

TABLE A 4.2

asset owned by household	during military	during civilian
Car	85	71
Motorbike	61	58
air conditioner	21	31
Television	295	255
Microwave	14	17
radio/cassette	321	265
Videoplayer	194	221
electric iron	258	231
Blender	55	73
electric fan	303	262
Refrigerator	162	158
Telephone	29	194
generating set	24	52
cooking gadgets	195	171
other assets	5	2

APPENDIX IV: LIST OF KEY INFORMANTS

1	**Mr. Micheal Alexander**	**Patron, Nka Uforo Iban Coop Society, Ilaje**
2	**Mrs Esop Monday**	**President, Nka Uforo Iban Coop Society, Ilaje**
3	**Mr. Solomon**	**Supervisor, Kwali Pottery Centre, Kwali**
4	**Mrs. Hawa Abubakar**	**Local Potter**
5	**Hon. Lateef A. Lamina**	**Supervisor for Health Ifelodun Local Govt. Amukoko**
6.	**Mr. J.A. Ogunleye**	**Chief Environmental Health Officer Ifelodun Local Govt. Amukoko**
7.	**Mr. Ogunbanwo**	**Head of Dept. Agric and Dev. Bariga Local Government, Ilaje**

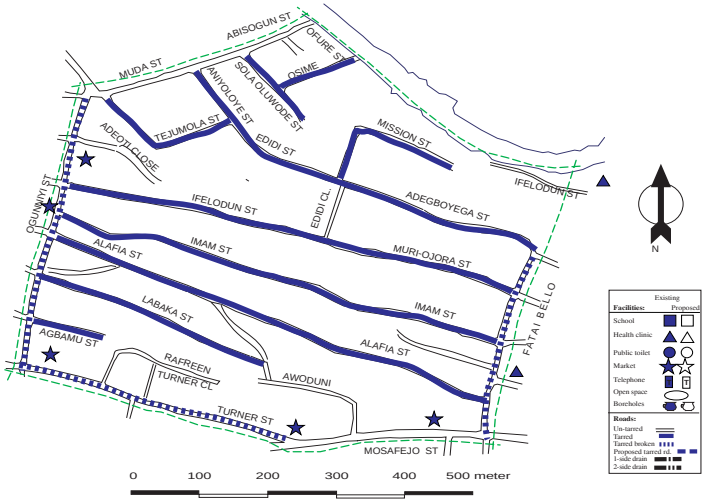
8	**Pa D.S. Osho**	**Chairman, Community Dev Association, Ilaje**
9	**Mr. S.O. Sokoya**	**Secretary, Community Dev Association Ilaje**
10	**Mr James Aghawoye**	**Vice Chairman, Community Dev Association Ilaje**
11.	**Mr. Olaiya**	**Fuel wood dealer, Amukoko**
12.	**Mrs. Rafiu**	**Fish seller, Amukoko Market**

APPENDIX V: MAPS

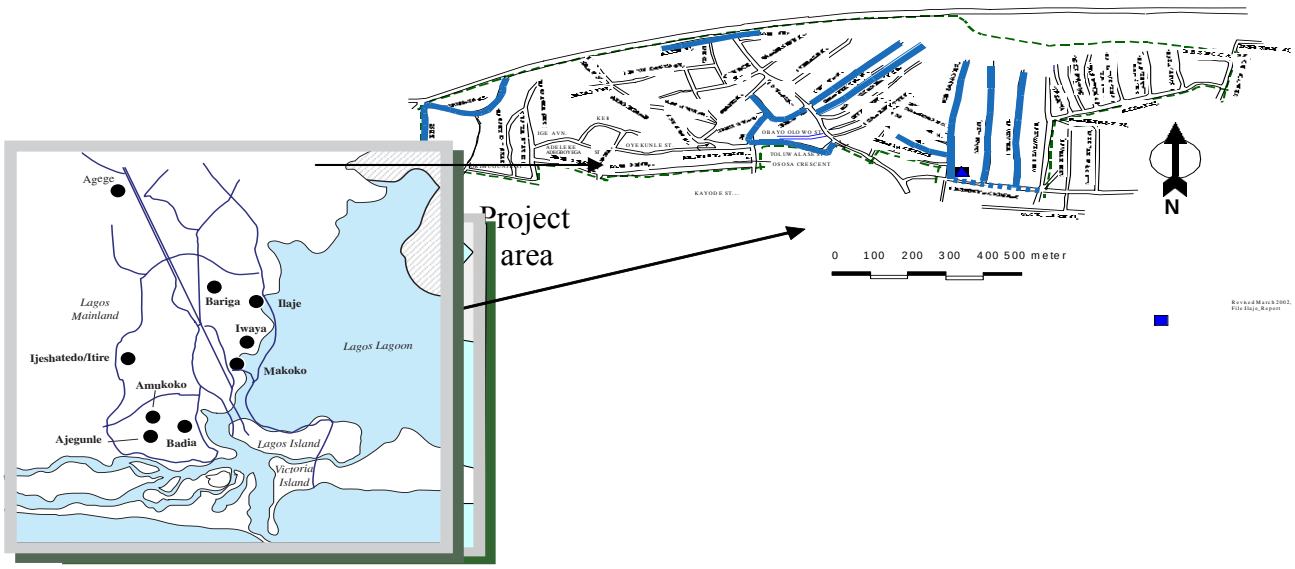
MAP OF NIGERIA

Project Cities

MAP OF ABUJA CITY



Map of Lagos showing Amukoko Community and transect walk



Map of Lagos showing Ilaje Community and Transect walk

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Energy Services and Urban Poor Livelihoods

A survey carried out by the Friends of the Environment (FOTE), has shown that besides the strong linkages between clean / affordable energy services and physical well being/productivity of household members, energy sector reforms in Nigeria can impact positively on household members as well as small-scale enterprises.

These were some of the findings of the organization made known at a high-level national workshop it organized recently with the theme-Enabling the Urban Poor Livelihoods Policy Making: Understanding the Role of Energy Services. The objective of the workshop was to draft country report of the urban energy project prepared by FOTE to an expert audience for evaluation, having concluded the data collection and analysis of the project.

In her welcome address to the workshop participants, FOTE Chairperson, Engr. (Mrs.) Joanna Maduka, said that ENERGIA,

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Editorial

THE ELECTRICITY POWER ACT

Electricity supply has had a chequered history in Nigeria, starting from 1896 when the Nigerian Electricity Supply Company (NESCO) was established to commence operation as an electricity utility company with the construction of a hydro electric power station near Jos.

Subsequently, the Electricity Corporation of Nigeria (ECN) was established in 1951 while the first 132 KV line was constructed in 1962 to link Ijora and Ibadan Power Stations. Also in 1962, the Niger Dam Authority (NDA) was established with the mandate of developing the hydropower potentials of Nigeria.

But in 1971, ECN and NDA were merged to form the National Electric Power Authority (NEPA) with the mandate of maintaining efficient, coordinated and economic system of electricity supply to all parts of the country.

Its installed capacity rose steadily from 532.6 MW in 1972 to 599 MW in 2004, made up of 4,058 MW from four gas thermal plants at Afam, Delta, Ijora and Sapele and 1,938 MW from three hydro power stations at Jebba, Shiroro and Kainji.

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