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BEYOND 'DESCENDING THE ENERGY LADDER': ASSESSING HOUSEHOLDERS' ENERGY SATISFACTION IN KANO STATE, NIGERIA

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ABSTRACT

This study aims at investigating householders' energy profile and degree of their satisfaction in Kano State, Nigeria. This study argues that apart from socioeconomic factors and energy 'price shocks', the energy poor using solid biomass are not always dissatisfied with their situation. This is psychologically and culturally rests on individual's perception and worldview. The study employed a household survey, administering 972 questionnaires across Kano Metropolitan and Non-metropolitan zones. The findings reveal that more than half of the households at the bottom of the ladder are satisfied with the type of energy they are using (Metropolitan = 57%; non-metropolitan = 79%). The study concluded that this could be as a result of the availability of that energy type and socio-cultural factors such family size and food preference. The study recommended that the in any study of household energy transition, there should be qualitative data about the reasons of choosing a particular energy type.

Keywords: Descending Energy Ladder, Energy Price, Energy Type, Satisfaction

INTRODUCTION

Nigeria as one of the major oils producing country is still facing severe energy crisis. It remains a critical challenge, more than 175 million Nigerian still lack access to clean energy for cooking. This affects the overall economic growth, health and environment (National Bureau of Statistics, NBS, 2024). Consequently, this force more than half of the population, particularly in the rural areas relying on fuelwood as the primary source of energy for cooking. Also, the market is highly volatile in circumstance of any regional tension around the world. This largely affect the local energy markets and eventually the choice of energy at household level.

Two decades ago, Maconachie, Tanko, & Zakariya (2009) examined the relationship between rising energy price and energy transition in Kano State, Nigeria. The central argument of their paper was that the notion of energy transition along the energy ladder is dynamic. In other words, household can move up to the top of the ladder or bottom (see Figure 1). This could be due to poor economic condition and change of energy price.

Coincidently, on 1st June, 2026, the Vanguard News Paper published an article titled 'Economic hardship: Nigerians revert to firewood as cooking gas, kerosene prices surge'. According to this article, this is being 'driven by an unprecedented surge in the prices of Liquefied Petroleum Gas, LPG, commonly known as cooking gas, and kerosene, many families in both rural and urban areas are returning to firewood for cooking. Interestingly, this corroborates Maconachie's et al., (2009) findings in line with descending the energy ladder. However, several studies in developing countries, sub-Saharan Africa in particular, indicate that apart from the identified factors, there are multi-dimensional ones that affect household energy choice and transition along the energy ladder (Hosier & Dowd, 1987; Masera, Saatkamp, & Kammen, 2000; van der Kroon, Brouwer, & van Beukering, 2013; Baiyegunhi & Hassan, 2014; Rahut et al., 2014; Mensah & Adu, 2015, and Bisu, Kuhe, & Iortyer, 2016).

Thus, this study aims to investigate other dimensions from psychological and socio-cultural factors that are beyond 'descending the energy ladder' as result of rising energy prices, using empirical evidences from Kano State, Nigeria.

Energy Ladder Model

Basically, the notion behind the model of the energy ladder is that of energy transition from low quality sources, such as solid fuels to high quality sources, such as liquid fuels as society develops (Tinta, 2024: Roser, 2021). An individual household can either ascend or descend the ladder (Figure 1).

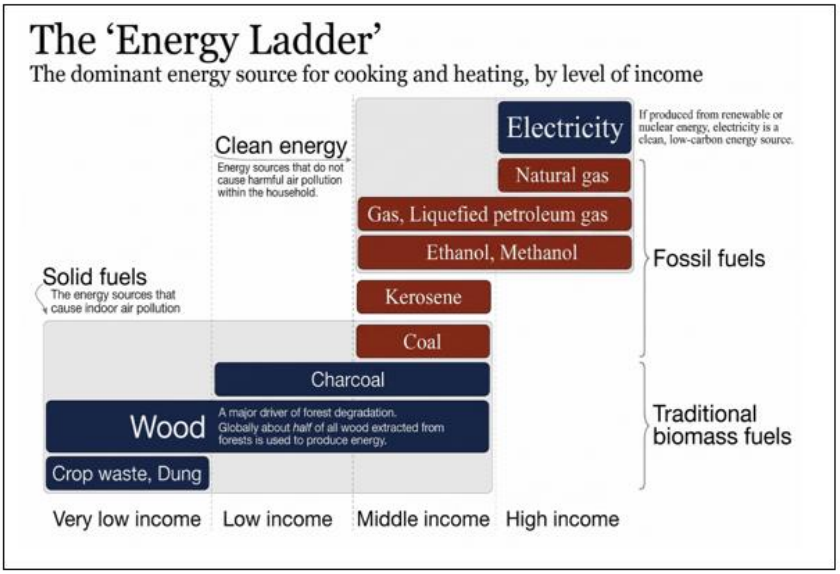

Figure 1: The Energy Ladder Model
(Source: Roser, 2021)

As indicated in Figure 1, the model assumes that people rely on solid fuels such as crop waste, animal dung, fuelwood and charcoal are low-income earners. By implication, they are struggling with energy poverty phenomenon and could be classified as energy poor. However, this assumption masks a lot of information about the household decision on energy choices due to different factors. Nonetheless, the energy ladder has been criticized of lack of rigorous empirical foundation to justify its basic premise and assumptions (van der Kroon et al., 2013).

MATERIALS AND METHODS

Kano State is located in the north western geopolitical zone of Nigeria, with 44 local government areas (National Population Commission, 2009). It situated within latitudes $10^0$25'N to $12^0$40'N and between Longitudes 7^0 35'E and 9^0 15'E (Figure 2).

The Kano State has a semi-arid climate (Aw), with a mean daily temperature of 30^0C. The months of December to February are colder, with the lowest temperature recorded around 20^0C. The climate is characterized by two seasons, namely, the rainy season from May to October and the dry season from November to April (Olofin, 1987; Ibrahim, 2018). The soils of Kano are derived from the two main geological formations; the Basement Complex and the Chad Formation. The Basement Complex rocks are quite variable in size and composition and include granites others. The soils on the Chad Formation, on the other hand, are poorly structured and excessively drained (Olofin, 1987).

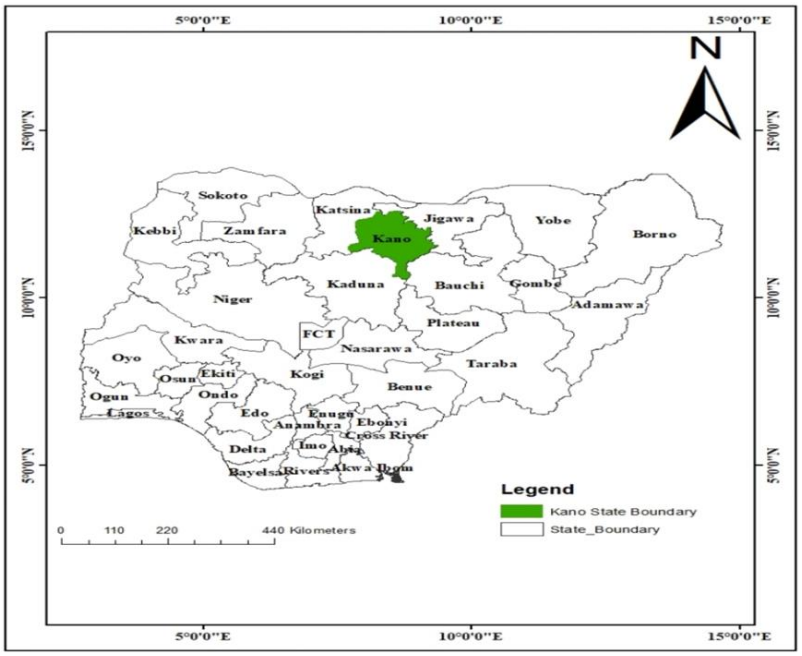

Figure 2: Map of the Study Area, Kano State, Nigeria
(Source: Zubairu et al., 2022)

The study adopted a quantitative method, using a semi-structured questionnaire survey. The questionnaires were comprised of closed-ended questions. A total of 972 questionnaires were administered, using a face-face method, across 4 Local Government Areas in both metropolitan and non-metropolitan of Kano State, Nigeria. The target population was the heads of households. The responses from the returned questionnaires were coded and subjected to analysis on SPSS (version 22) software.

RESULTS AND DISCUSSION

Energy Satisfaction and Types of Energy for Cooking

This section compares household energy type and satisfaction with energy use for cooking. Table 1 shows 3 energy types (modern, transitional and traditional) for cooking and the levels of satisfaction for both metropolitan and non-metropolitan zones.

This section does not consider household energy consumption thresholds, that is the amount of energy required by a particular household (González-Eguino, 2015). Rather, it explores the relationships between the type of energy for cooking and satisfaction from the respondents' viewpoints. Findings from this section can help us to evaluate the householders' readiness to transition to modern energy services for cooking.

Table 1: Energy for Cooking Satisfaction Vs Type of Energy for Cooking

LGA Location			Solid cooking energy	Liquid cooking energy	Clean cooking energy	Total
Metropolitan	Energy for cooking satisfaction	Yes	164	35	105	304
			57%	64%	80%	64%
		No	121	20	26	167
			43%	36%	20%	36%
	Total		285	55	131	471
			100%	100%	100%	100%
Non-Metropolitan	Energy for cooking satisfaction	Yes	356	2	27	385
			79%	100%	96%	80%
		No	96	0	1	97
			21%	0%	4%	20%
	Total		452	2	28	482
			100%	100%	100%	100%

Table 1 indicates that 80% of modern energy users in the metropolitan zone are satisfied with their energy situation and 96% of modern energy users in the non-metropolitan zone are similarly happy with their energy for cooking. In contrast, 20% and 4% of modern energy users are dissatisfied with their current energy situation in the metropolitan in non-metropolitan zones respectively. Feelings of dissatisfaction with modern energy services might stem from high costs or unreliability of supply. Other factors that might contribute to energy dissatisfaction in the metropolitan zone may include high energy cost, which culminates in poverty. It is worth stating here that the data for this study was collected during a period of financial recession in Nigeria.

Table 1 shows a total of 55 of the households in metropolitan zone use transitional energy carriers for their cooking. Approximately 64% of these households are satisfied with their energy situation. This is not surprising, because transitional energy (kerosene) is not the preferred energy carrier for cooking in this area as previously reported by Hyman (1994) and Maconachie et al. (2009). Also, its scarcity could be a source of householders' dissatisfaction. Naibbi & Healey (2013) found an inequality of fossil fuel distribution between the south and north of Nigeria. Moreover, there have been reports of fossil fuel smuggling to neighbouring countries that share the border with northern Nigeria (Odihi, 2003; Maconachie et al., 2009). Consequently, the kerosene supply in the study area is likely to be limited. In addition, there is the negative impact of 'black market' vendors to consider, which also creates sporadic artificial scarcity (Hyman, 1994; Odihi, 2003). Undoubtedly, these factors will make kerosene a less favourable energy choice for cooking in the study area.

Table 1 shows that 57% of traditional energy users in the metropolitan zone are satisfied with their energy supply. In contrast, 79% of traditional energy users in the non-metropolitan zone are satisfied with their energy for cooking. This is a surprising outcome, suggesting that large numbers of households depend on traditional energy for cooking, yet are satisfied with their energy situation. Their satisfaction may be as a result of cultural heritage like, 'we thank God' and 'I cannot complain'. This type of attitude is more common among non-metropolitan dwellers.

The results show that regardless of energy source, non-metropolitan householders express more satisfaction than their metropolitan counter parts. One possible explanation for this may be that the traditional energy system is more reliable than the modern energy system in the study area, particularly in the non-metropolitan zone. Also, rural households have larger family size compared to urban ones. In addition, traditional food is more readily available in rural households. Nevertheless, the findings also reveal that the householders in the metropolitan zone are more dissatisfied with traditional energy type for cooking than their counterparts in the non-metropolitan zone. The findings also suggest that irrespective of geographical or social setting, people are happier to use modern energy carriers than traditional carriers for their cooking. In other words, the majority of the householders in the study area showed preference to use modern energy for cooking. This corroborates Naibbi & Healey's (2013) findings who found that the majority of householders in Yobe State, northern Nigeria were in favour of using modern energy for cooking. Earlier, Onyebuchi (1989) found that despite the severity of energy poverty in rural areas of Nigeria, a large proportion of the rural population preferred to use modern energy for cooking.

CONCLUSION

This study revisits the notion about 'descending the energy ladder' in Kano State, Nigeria. It provides empirical evidences from the Metropolitan and Non-metropolitan zones of the state. It found that despite that large portion of the population are using traditional type of energy such as fuelwood, people are still happy and satisfy with their energy situation. The study suggested that this could be as a result of the availability of that energy type and socio-cultural factors such family size and food preference. Thus, in any study of household energy transition, there should be qualitative data about the reasons of choosing a particular energy type at a particular period.

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