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Effect of Fuel Subsidy Removal on Households' Consumption Expenditure in Kaduna State, Nigeria

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ABSTRACT
Petrol and other crude oil products are the major contributory factors to the growth and development of Nigerian economy as major sources of revenue and employment opportunities to the teeming population in the country. The removal of fuel subsidy in Nigeria has affected every micro and macro-economic variables such as demand and supply, consumption and investment expenditures, stock prices, inflation rate, and exchange rate, oil revenue and so on. The aim of the paper is to empirically analyze the effect of fuel subsidy removal on households' consumption expenditure in Kaduna state, Nigeria. The population of the study includes households residing in both Urban and Rural areas (Zaria, Sabon Gari, Kaduna North, Kaduna Sauth, Kajuru, and Kachia) with diverse socio-economic background that rely on fuel as means of transportation and other essential activities in the study area. The made use of primary source for data collection which involves conducting Key Informant Interview (KII) and administering structured questionnaires to the households. A multi-stage sampling procedure will be used for the study; where at least: a total sample size of 300 households will be randomly selected using Multi-stage Nonfinite Population (MNP). From the chi-square results analysis revealed that fuel subsidy removal has affected household's consumption expenditure especially on food and services where most household felt their prices cannot longer solve their immediate needs like before, their demand for food, services, housing rent, and other utilities were affected. It is however recommended Kaduna State Government and Federal Government of Nigeria should embark on policies and programmes that will mitigate this policy of fuel subsidy removal through making domestic goods especially food production and services more efficient so as cushion the effect of fuel subsidy removal.

INTRODUCTION

Crude oil is one of the most critical energy sources in modern industrial economies. It is considered as an important indicator to capture stability of world economies currently due to their over dependence upon the oil products (Sadeeq *et al* 2023). Over five (5) decades, crude oil has overwhelmingly accounted for larger portion of about 70% of export and imports for oil exporting and oil importing countries in Africa respectively.

Moreover, the Nigeria's microeconomic and macroeconomic performance has been strongly associated with the oil sector. Although Nigeria remains Africa's second-largest oil producer after Angola in 2022, the country has inadequate refining capacity; hence, it imports refined petroleum products to meet the local demand. Thus, the government kept subsidizing petroleum products so as to maintain its controlled price

despite the changes in prices in the international oil market and the exchange rate (Bello *et al.,* 2025).

An increase in price of oil should be seen positive in nations that export oil and negative in those that import it; the opposite should be anticipated when the price of oil declines. For oil-producing countries like Nigeria, however, the combined impact of rising oil prices and unstable currency rates poses a truly formidable challenge to overall economic stability and progress. Considerable increases in government spending are typically linked to periods of rising oil revenues in Nigeria, while periods of declining oil revenues are typically connected with budget deficits (Eric 2020). Theoretically, the rise in the price of oil leads to a rise in the domestic cost of production, then the supplier price index will also increase, and the wages will also rise thereby reducing the level of employment and level of output which will lead to a rise in both the consumer and producer price indices (Akinlolu and Nejo 2020).

The allocation to subsidy in 2022 reflects the increasing and mounting cost of financing fuel subsidy in Nigeria. Between 2005 and 2021, Nigeria spent 13.7 trillion to finance fuel subsidy. This amount would have revolutionized Nigeria's energy (power and downstream petroleum) sector, making the country a net exporter of refined petroleum products. This would have had far-reaching impact on the economy beyond the downstream petroleum sector (NEITI, 2023).

However, the effective cost of financing subsidy is significantly more than the cumulative subsidy budget or the opportunity cost of subsidy spending. Despite being the world's 5th largest producer of crude oil, subsidy has made private investment in the downstream sector largely unattractive. The combined effect of fuel subsidy and products importation is responsible for a large part of Nigeria's current economic challenges including low GDP growth in the petroleum sector, foreign exchange and balance of payments problems, and a worsening debt profile. Given this reality, neither government nor other stakeholders can continue to ignore the severe danger that fuel subsidy pose to the economy and the future of the country (Muhammad, *et al.,* 2023).

Even though subsidy was first designed as a short-term response to international oil price shock, repeated attempts to end or reform it has yielded limited and largely ineffectual results. However, these attempts have failed to reduce the subsidy burden. The cost of financing fuel subsidy continues to increase even after several upward price adjustments. This is because, due to high levels of product importation and fixed price of petrol, factors like inflation, exchange rate movements and oil price volatility increase the cost of subsidy to the economy (IEA, 2024).

Petrol Motor Spirit (PMS) Price increase has always been resisted because of potential hardship to the poor. Yet, the largest share of the benefits of fuel subsidy is enjoyed by high- and middle-income households. The low-income and poor populations derive little benefit from subsidy. The richest 40% consume 90% of PMS while the poorest 40% consume just 4% of the fuel (NNPCIt, 2024). Similarly, the impact of PMS subsidy on commercial transportation is limited, as less than half of mass transit rely on PMS for fuel. Hence the cost of subsidy to poor and low-income households significantly exceeds the benefits that they derive from it (Garba, 2024).

Consequently, the implication of maintaining the subsidy regime against all odds, on Nigeria's fiscal sustainability and macroeconomic stability had become a major concern to policymakers. For example, on April 14, 2022, the National Assembly approved N4 trillion to finance fuel subsidy for 2022. The amount represents more than 700% increase from the initial estimate of N442.7 billion, which was first submitted for approval. The increase in the subsidy budget pushed the total budget deficit up by more than 15% to N7.35 trillion (Alfa *et al*. 2024). In order to accommodate the additional subsidy budget, the government not only had to consider borrowing to fill the gap but had to also slash the budgets for basic health, basic education, technology infrastructure, and allocations to Niger Delta and North-east development commissions (Buhari, *et al.,* 2024).

The fuel subsidy removal leads to a change in consumption patterns, as households resort to consuming less and buying food of lower quality. The increased food expenditure, transportation faire, rents, and other necessities make them more sensitive to any increase in food prices and other necessities to removal of oil subsidy (Ajiboye and Orebiy, 2022) and households end up with less disposable income for other household necessities. It is therefore important to analyze the effect of fuel subsidy removal on households' consumption expenditure, as this will give an insight into how removal of subsidy affects household consumption expenditure in the study areas in particular and the country at large. This will give direction in designing policy measures that can be put in place in order to mitigate the effects of fuel subsidy removal. Understanding the impact of fuel subsidy removal in short run and long run could also help government in policy interventions aimed at reducing household skyrocketing expenditure in Kaduna State, Nigeria.

It is against this background that this study put forward the following research questions:

Research Questions

1. What are the socio-economic characteristics of the civil/public servants, private firm workers, farmers, and trader-households in the study areas?
2. What is the effect of fuel subsidy removal on household's consumption expenditures in Kaduna State, Nigeria?

Objectives of the Research

The broad objective of this study is to empirically analyze the effect of fuel subsidy removal on households' consumption expenditures in Kaduna State, Nigeria. The specific objectives are to:

1. describe the socio-economic characteristics of the civil/public servants, private firm workers, farmers, and trader-households in the study areas;
2. evaluate the effect of fuel subsidy removal on households' consumption expenditures over a period of study in Kaduna State, Nigeria;

Null Hypotheses

Through the testing of the null hypothesis, the aforementioned goal is accomplished through:

H_{01}: In the research area, the fuel subsidy removal has no significant effect on households; consumption expenditures in Kaduna State, Nigeria.

LITERATURE REVIEW

Conceptual Literature

Concept of Fuel Subsidy

According to Ong (2020), a fuel subsidy is a type of financial aid given by the government to lower the cost of fuel for consumers, usually by subsidizing petroleum products to keep prices below the market rate. Ewing (2014) describes a fuel subsidy as a government policy designed to keep fuel prices low for consumers through financial support, with the goal of enhancing economic stability and social welfare.

Kojima (2020) explains that a fuel subsidy is a type of government intervention in the energy market where the government pays the difference between the market price and the retail price of fuel to reduce the financial burden on consumers. Thus, it can be concluded that a fuel subsidy is a form of government financial aid intended to lower fuel costs for consumers, with the goal of keeping fuel prices low and increasing affordability for the general public.

Concept of Households

In economics, households are described as groups of individuals living together who share resources and responsibilities, functioning as both consumers and suppliers of labour in economy (Glenn and Anthony, 2017). According to David (2019), households are the smallest economic units involved in consumption and production activities, forming the basis of the economy's demand side.

According to William and Alan (2021), households are fundamental economic units made up of individuals living together and sharing resources, usually connected by social or familial bonds. Households serve as the primary consumption units in an economy, allocating resources such as labour and capital to fulfill their needs and wants (Paul and William, 2020). Therefore, a household consists of individuals living together who jointly make economic decisions regarding consumption, saving, and investing.

Concept of Consumption expenditure

According to Blanchard and Johnson (2018), consumption expenditure represents the portion of disposable income that households allocate towards the acquisition of goods and services to fulfill their immediate wants and needs, thereby contributing to overall economic demand. In the words of Parkin *et al.,* 2017, consumption expenditure encompasses the total spending by households on goods and services for direct consumption, excluding investment and government purchases. It is a crucial component of aggregate demand and plays a significant role in driving economic growth and development.

Consumption expenditure, as defined by Mankiw (2018), represents the aggregate spending by households on consumer goods and services, including food, clothing, housing, and leisure activities. In other words, consumption expenditure encompasses the total spending by households on various goods and services to satisfy their needs and wants. It is a crucial component of aggregate demand and a key driver of economic growth and development.

Concept of Petroleum Motor Spirit (PMS)

According to Vartapetov (2016), Petroleum Motor Spirit (PMS), commonly known as fuel or gasoline, is a hydrocarbon-based, volatile fuel widely used in cars and small engines. It is derived from the refining process of crude oil and is essential for running internal combustion engines. PMS, often called gasoline, is a flammable liquid produced through the fractional distillation of crude oil. It plays a critical role in powering internal combustion engines in vehicles, motorcycles, and various types of machinery (Robert, 2018).

James (2021) described fuel, particularly Petroleum Motor Spirit (PMS), as a refined petroleum product made mostly of hydrocarbons within a specific boiling range, making it ideal for use in spark-ignition engines. It serves as a crucial energy source for transportation and numerous industrial applications. Thus, fuel is a flammable substance mainly consisting of carbon that, when burned efficiently, generates substantial heat, making it suitable for a variety of domestic and industrial uses in a cost-effective way.

Theoretical Literature Review

Demand-pull inflation theory

The principle of demand-pull inflation asserts that inflation occurs in the event that demand raises so high that goods and services become limited due to an increase in the cost itself. This principle is based upon the notion that if desired goods and services come to fruition, the producers will raise prices to ensure greater profit margins, thereby

raising the overall price level of the economy. Thus, demand-pull inflation is caused by an increase in demand over what supply can provide, resulting in increased prices. Demand-pull inflation can occur due to excessive consumer demand, increased governmental expenditures, or overall investment beyond average. For instance, the government may increase its expenditure on public projects by seeking to create more roads and bridges. Public demand for such projects increases where supply in the form of materials and labor must be held. As materials and labor become more limited in availability, demand increases for such items and hourly wages. Thus, demand pull inflation inflates the price of such materials and construction-based wages.

Demand-pull inflation can have both positive and negative effects on the individual and the entire economy. In the short term, it can stimulate economic growth as businesses experience increased sales and profits (Dokubo *et al.,* 2023). In demand-pulled inflation, the high price results in higher revenue for businesses, in turn, help them advance business expansion plan and job creation. However, in the long term, demand-pull inflation can erode consumers' purchasing power and reduce their living standards. It can also lead to income inequality as those with fixed incomes struggle to keep up with rising prices (Ipinnimo *et al.,* 2023). Furthermore, demand-pull inflation can lead to an imbalance in the economy. When certain sectors experience a surge in demand, resources may be diverted from other sectors, leading to inefficiencies and potential economic instability. Additionally, if inflation is not properly managed, it can create expectations of further price increases, leading to a self-perpetuating cycle of inflation (Appah and Tebepah, 2023).

Suleiman et al. (2024) examine the impact of petrol subsidy removal on government income, cost of living, consumption patterns, savings and investment and the performance of small and medium enterprises (SMEs) in the north-central region of Nigeria. Using a survey research design, with a sample of 483 respondents comprising government officials, SME operators, and individual households from the state capital metropolis; and a questionnaire to collect data and employed partial least squares structural equation modelling for the analysis. The results of the study showed that petroleum subsidies have a negative and significant effect on consumption patterns, the cost of living, savings and investment, and SME performance. However, it has a positive and significant effect on government income. Additionally, the researchers discovered that government income and SMEs' performance have a positive and significant effect on living standards among people in north-central Nigeria. The study emphasizes the need for well-calibrated strategies to minimize the socioeconomic effects of the government's petrol subsidy removal policy, such as targeted social safety nets, poverty reduction programs, and alternative energy investment to balance budgetary sustainability and citizen well-being; and also suggests that SMEs must adjust to changing customer behaviour, and individuals must be encouraged to make smart financial decisions to counterbalance the impact of petrol subsidy removal.

Empirical Literature

Idisi et al. (2024) evaluate the effect of fuel subsidy removal on the livelihood of households in Bwari Area Council, FCT-Abuja, Nigeria using multi-stage and random sampling techniques, descriptive statistics, multiple regression analysis, and Garrett ranking to analyze the data. The findings indicated that a majority of the respondents were household heads (60%) aged between 30-39 years (42.5%), with an average age of 39. Most were married (68.75%) with household sizes typically ranging from 4-6 persons (48.75%). The primary source of livelihood for many was civil/public service (35.0%), and a significant portion (67.5%) had attained tertiary education, although 70.0% were not affiliated with any cooperative association. The study revealed that a majority of respondents strongly agreed (52.5%) that the removal of fuel subsidies adversely affected their businesses, making it difficult to afford children's school fees. Additionally, they reported significant impacts on the high costs of transportation (76.3%), healthcare services (71.3%), and food items (76.3%). Based on these findings, the study recommended that the government should implement measures such as price controls, improved distribution channels, accessible credit facilities for farmers, enhanced public transportation services, and the introduction of social welfare programs, job creation initiatives, and skill acquisition schemes. These interventions are aimed at mitigating the adverse impacts of fuel subsidy removal on households in Nigeria.

Monsuru (2024) examines the impact of fuel subsidy removal on household spending in Nigeria. The study employs a qualitative research design, utilizing a literature review to explore the multifaceted implications of fuel subsidy removal in Nigeria. The findings reveal that while subsidy removal can lead to cost savings for the government and increased efficiency in the petroleum sector, concerns about inflationary effects and affordability of essential goods and services persist. This highlights the complex trade-offs policymakers must navigate when considering fuel subsidy reforms. To address these challenges, the study recommends that policymakers design subsidy reform plans that protect the poorest and most vulnerable, phase any price increase appropriately, communicate effectively to all groups, invest additional funds in productive sectors, and implement transparency mechanisms.

Muhammad at al. (2023) empirically examine the effect of fuel subsidy removal on households' consumption

expenditure in North-west Nigeria using Key Informant Interview (KII) and administering structured questionnaires to the households a multi-stage sampling, descriptive statistics and pre-post analysis using Wilcoxon signed-rank test were used. Results of the findings show that, that about 70% of the households earn their main income from farming, handcrafting/sole-proprietorship or trading. Procedure was used for the study. Also, about 89% of the households are earned below the standard absolute international poverty line of US$2.15 for each individual per day. The result further reveals that on average basis, the price of food items consumed by the households in the study area has increased by 95.57%, at the post-fuel subsidy removal period. Lastly, the study recommends that, more public and private refineries should be constructed by the government and private investors while the existing ones rehabilitated; households are encouraged to engage in more economic activities so as to diversify their means livelihood.

Muktar (2023) examined the implications of fuel subsidy removal in Nigeria using a systematic review approach. The findings highlight both positive and negative impacts of fuel subsidy removal on the economy. Positively, the removal of fuel subsidies can unlock financial resources for investment in other sectors. It also encourages domestic refineries to increase production, decrease reliance on imported fuel, stimulate employment opportunities, allocate funds towards critical infrastructure projects, enhance fiscal balance by reducing deficits and generating surpluses, decrease government borrowing, mitigate corruption associated with subsidy payments, promote competition, rejuvenate domestic refineries, and alleviate pressure on the exchange rate. These findings indicate that well-managed fuel subsidy reforms have the potential to deliver substantial economic advantages for Nigeria. The study advises the Nigerian government to approach fuel subsidy reform cautiously and recommends implementing adequate compensation schemes to offset the adverse effects on households and businesses.

Oladoyin (2021) investigate the impact of fuel subsidy and its implications on social spending in Nigeria. The discussions center on the socio-economic and political implications of fuel subsidy reforms. Critics argue that subsidies place a significant fiscal burden on the government, diverting resources away from essential social investments in education and health. This research note explores the consequences of removing fuel subsidies on social spending in Nigeria. It highlights the potential socio-economic pressures resulting from such reforms and offers suggestions for the government to mitigate these impacts. The recommendations aim to balance fiscal responsibility with social welfare, ensuring that the most vulnerable populations are protected and that investments in critical social sectors are not compromised.

Abdulkadir *et al*. (2020) conducted a study in Maiduguri metropolis, Borno state, Nigeria, examining how the removal of fuel subsidies affected the socioeconomic traits of households using a survey data analyzed through descriptive statistics and simple regression methods to explore the policy's implications, particularly its impact on the well-being of poorer individuals. The findings revealed that a significant majority of respondents were male (70.4%), married (61.3%), and aged between 30-39 years (41.5%). A substantial proportion had tertiary education (50.7%), worked as civil servants (52.1%), and earned monthly incomes ranging from ₦40,000 to ₦59,999 (34.5%). Family size and dependents were also notable factors, with 56.3% of respondents having 8-10 family members and 57.7% supporting 1-5 dependents. The study recommends focusing on the following measures: increasing workers' wages and salaries, implementing family planning initiatives, and reducing transportation costs. These measures are crucial for mitigating the negative impacts of fuel subsidy removal on individuals, particularly those in vulnerable economic situations. The research underscores the importance of implementing complementary policies and interventions to support households and facilitate a manageable transition to a fuel subsidy-free environment in Nigeria.

Agboje (2018), examine the implications of switching fuel subsidy on household welfare in Nigeria using a static computable general equilibrium model. The study assessed the impact of both partial and complete withdrawal of the PMS (Premium Motor Spirit) consumption subsidy, as well as alternative policies, on the welfare of farm and non-farm households in Nigeria. The results showed that both partial and total PMS subsidy reform, with the subsidy gains conserved, led to reduced household consumption levels, increased expenditures on all commodities, and reduced social welfare by a worst of ₦70.47 billion and lowest of ₦40.80 billion. These findings suggest that the removal of fuel subsidies, even with the subsidy gains being conserved, had a negative impact on the welfare of Nigerian households. The study suggests that, eliminating the PMS subsidy may negatively affect household welfare, but redirecting the subsidy savings to the crop and service sectors can boost household consumption and enhance social welfare. This underscores the critical need for well-planned and effectively implemented fuel subsidy reform policies to minimize adverse impacts on households, particularly in developing nations such as Nigeria.

METHODOLOGY

The study Area

Kaduna State is situated between latitudes 09003 and 11032, north of the equator, and between longitudes 0600

and 0900 east of the Greenwich Meridian. The state's land area is approximately 48,473.2 square kilometers, and it borders the states of Bauchi, Plateau, Nasarawa, Niger, and the Federal Capital Territory of Abuja to the east, north, south, and west, respectively (NAERLS, 2018). With a population of approximately 6 million as of the 2006 census and an estimated 10 million residents by 2015, the state was the third-most populated in Nigeria, behind Kano and Lagos states (NPC, 2006).

As a former capital of Northern Nigeria and a cosmopolitan society with a very high population is known for the many households' consumption expenditures on agricultural marketing, transportation networks, housings of small and medium enterprises, petty traders, civil/public servants and the third most populous state in terms of fuel consumption in the country.

Population of the Study

The population of the study comprises low-income households that engaged in informal economic activities in Kaduna state. During reconnaissance survey a household listing was carried out in selected communities and an updated sampling frame of N = 1,200 civil/public servants, private firm workers, farmers, and trader-households were compiled.

Therefore, the target sample for the survey is approximately (300). The sample was allocated to LGAs and communities proportionally to their frame: for example, the LGA allocations are approximately based on 25% obtained from the formula, fifty households (50) from Zaria, fifty households (50) from Sabon Gari, fifty households (50) from Kaduna North, and fifty households (50) from Kaduna South, fifty households (50) from Kajuru, and fifty households (50) from Kachia.

Research Design

The qualitative techniques involved the use of descriptive statistics and trend analysis in order to measure the relationship between fuel subsidy removal and households' consumption expenditure in Kaduna State, Nigeria which was used to achieve the objective of the study. The study utilized summary statistics and a chi-square to explore the interrelationships among the variables. The study adapted the work of Abdulkadir *et al*. (2020) in the field of social science after a slight modification on his work; titled: "Assessment of Impact of Fuel Subsidy Removal on Socio-economic Characteristics: A Survey of Households in Maiduguri, Borno State, Nigeria. But this research went on different modifications such as: method of data collection, variables used, scope and methodologies adapted in the study.

Sampling Procedure and Sample Size

Multi- stage sampling was used for the study in the following ways:

Stage 1 (LGA selection): Six Local Government Areas (LGAs) from three different senatorial zones in the state such as: Zaria and Sabon Gari from Zone 1 senatorial district; Kaduna North and Kaduna South from Zone 2 senatorial district; and Kajuru and Kachia from Zone 3 senatorial district was purposively selected due to documented high prevalence of informal economic activity (Kaduna State Ministry of Commerce, 2024). The purposive choice was justified by the study focus on civil/public servants, private firm workers, farmers, and trader-households; however, we acknowledge the limitation this imposes on statistical generalizability to LGAs with different economic structures.

Stage 2 (community selection): In each selected LGA, two communities were selected from the listed community frame using simple random sampling (from complete community lists). Community selection was carried out with probability proportional to community size to preserve representativeness.

Stage 3 (households): Within each selected community, households were listed during the pilot/reconnaissance survey. Households meeting the civil/public servants, private firm workers, farmers and traders, inclusion criteria (defined by monthly household income thresholds and principal engagement in informal activities) formed the sampling frame per community. Households were selected by simple random sampling from these community lists.

Finally, a simple random sample of households' consumption expenditure in each community was taken from the list of the target population in the selected communities developed during the reconnaissance survey. Therefore, a sample size for each community was determined using estimate of the income variance for the different communities, a 95% confidence interval and a 0.05 margin of error, using a Slovin Formula given as:

$$n_0 = \frac{N}{1+(Ne^2)} \quad (1)$$

Where: n_0 is the required sample size; N is the sample frame and e = the expected error.

Thus: $n_0 = \frac{1200}{1+1200(0.05^2)} = \frac{1200}{1+1200(0.0025)} = \frac{1200}{1+3} = \frac{1200}{4}$ = 300

Therefore: $n = \frac{300}{1200} \times 100 = 25\,\%$

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Furthermore, during the reconnaissance, participants were asked to name the commodities and services frequently served/consumed and are affected by fuel subsidy removal. Based on the responses, a list of ten five commodities/services commonly served/consumed was generated. If 7 or more in 10 participants reported having been served/consumed a particular goods/ service, the goods/services item was selected to be used in the final questionnaire.

Method and Sources of Data Collection

The study was utilized primary data. The primary data was collected through a structured questionnaire which was administered by trained enumerators; the questionnaire was captured information on the socioeconomic characteristics of the respondents, household disposal income weekly and monthly consumption expenditure

Descriptive Statistics

Descriptive statistics was summarized the socio-economic characteristics of the respondents in the study area. Measures such as mean, frequency distribution, and percentages were also used to achieve objective (i) of the study. This provided a preliminary understanding of household characteristics and contextual factors that may influence food security.

Method of Data Presentation

The descriptive statistics technique was used to analyze the data collected, and the sample in which conclusion was made.

Method of Data Analysis

In econometric, different method can be used to show the relationship between dependent and independent variables. However, since the research study was used one source of data that is primary source in order to reduce data to an interpretable form so the relationship between problems can be studied and tested. Therefore, the model of analysis were to be used in this study is simple percentages, tables, mean score model (x) along with frequency distribution and Chi-square mode of analysis. These methods are chosen to facilitate simple but elaborate interpretation of results obtained from the analysis; the interpreted results will be further represented in tables and figures for easy understanding at a glance.

Specification of the Chi-square Model

The mean score model (x) was used in the data analysis as expressed in section one of this work and using this formula applied as:

Mean score (x) = $\frac{\Sigma fx}{n}$

Where Σ = summation or sigma

F = frequency of response

X = rating of the response

N = total response

The likert 5 point scale under which mean score (x) model is used as given:

The "X" which is the response rating is as follows:

SA	A	U	D	SD
5	4	3	2	1

Response A = the entire randomly selected households around Kaduna State which gives a total response of 300 as might be returned respondents.

To get the actual score of these items, each of the responses is rated as shown above, that is Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D) and Strongly Disagree (SD).

The mean score is to be calculated on the total score. The decree of agreement by the respondents on each item might be shown in conclusion.

Also, chi-square (Ψ^2) was used to test hypothesis stated in section one.

It is given by $\Psi^2 = \frac{\Sigma(O-E)}{E}$

Where Ψ^2 = chi-square

0 = observed frequency

E = Expected

RESULTS AND DISCUSSION

Section A: Demographic information of Households

This section includes the examination of socio-economic variables of the respondents; such as: sex, age, educational qualification, household size, income and occupation. The data in this section are converted into frequency using tables.

Table 1: Gender Structure of Household in Kaduna State, Nigeria

Item	Civil/Public servant	Private worker	Farmer	Trader	Total
Male	55(37.93%)	30(20.68%)	35(24.14%)	25(17.24%)	145(72.5%)
Female	20(27.27%)	35(36.36%)	10(18.18%)	10(18.18%)	75(27.5%)
Total	75	75	45	35	200

Source: Field Survey, 2026

Table 1 above shows the gender structure of household in Kaduna state, Nigeria. It also shows that there is predominance of men as household heads than female; male constitute 72.5% of the population under study and female with remaining 27.5% of the population. Also, the tables shows that male civil/public servants constituted the highest number of male with 37.93% of male; while private workers, farmers, and traders were with 20.68%,

24.14%, and 17.24% respectively. However, the female farmers and traders have the same number of female given by 18.18% each, while 36.36% and 27.27% were for civil/public and private workers respectively.

Table 2: Age Structure of Household in Kaduna State, Nigeria

Item	Civil/Public servant	Private worker	Farmer	Trader	Total
21-30	5	3	9	10	27(13.5%)
31-40	20	5	11	20	56(28%)
41-50	30	20	8	7	65(32.5%)
Above 51	25	15	7	5	52(26%)
Total	80(40%)	43(21.5%)	35(17.5%)	42(21%)	200

Source: Field Survey, 2026

Table 2 above shows the age structure of households, it also shows that most of the households are within the age of 41-50 years that is 32.5%, followed by 31-40 years which is 28%. Next are Above 51 and 21-30 with 26% and 13.5% respectively. Also, the civil/public servants made up the greatest number of age group with the total number of 80 households responded to 40%, followed by 21.5% and 21% for private firm workers and traders respectively; and finally 17.5% for farmers.

Table 3: Occupation Structure of Household in Kaduna State, Nigeria

Occupation	Frequency	Percentage
Civil/Public servant	65	32.5%
Private worker	30	15%
Farmer	75	37.5%
Trader	30	15%
Total	200	100%

Source: Field Survey, 2026

Table 3 above shows that most of the respondents or households are farmers with 37.5%, followed by civil/public servants of 32.5%; while private workers and traders shared the same 15% respectively. It could also be deduced that farmers are more because the Kaduna State people are largely and predominantly farmers as their occupation.

Table 4: Income Group Structure of Household in Kaduna State, Nigeria

Item	Civil/Public servant	Private worker	Farmer	Trader	Total
Low Income	5	3	20	20	48(24%)
Middle Income	35	25	29	21	110(55%)
High Income	17	18	3	4	42(21%)
Total	57	46	52	45	200

Source: Field Survey, 2026

Table 4 above shows that most of the respondents constituted middle income group in Kaduna State, Nigeria; the table indicated that middle income group constitutes 55% of the population, followed by low income which has 24% and high income group with 21% respectively. The table also indicated that most of farmers and traders in Kaduna State are low income earners; and most of civil/public servants and private workers are middle income and high income earners respectively.

Table 5: Household Educational Qualification in Kaduna State, Nigeria

Item	Civil/Public servant	Private worker	Farmer	Trader	Total
No Formal	-	-	5	5	10(5%)
Primary	-	-	13	10	23(11.5%)
SSCE/OND	3	2	17	25	47(23.5%)
HND/Degree	35	15	7	15	72(36%)
M.Sc./PhD	26	11	6	5	48(24%)
Total	64	28	48	60	200(100%)

Source: Field Survey, 2026

It is clear from table 5 that most households are of Higher National Diploma and degree holders that constituted 36% of the population under study, followed by master's and doctorate degrees with 24%, next is SSCE and OND certificate holders with 23.5%. Also, no formal and primary education categories are with 5% and 11.5% respectively. In addition civil/public servants constitute greater proportion of the population with highest academic qualification (M.Sc. and PhD), and no formal education and primary education holders constitute greater proportion of households with lowest academic qualification of the population under the study area.

Structured and Administered Questionnaire

Table 6: Effect of Fuel Subsidy Removal on Households' Consumption Expenditures

Items/Statement	SA 5	A 4	U 3	D 2	SD 1	FX	FX/X	X	Conclusion
1. The removal of fuel subsidy has significantly increased my household's expenditure on petrol and transportation.	60	70	20	30	20	720	3.6	4	Agreed
2. The removal of fuel subsidy has increased the overall cost of living in my household.	55	80	15	40	10	730	3.65	4	Agreed
3. The removal of fuel subsidy has reduced the amount of income available for other household needs.	65	73	17	30	15	712	3.56	4	Agreed
4. The removal of fuel subsidy has negatively affected my household's purchasing power.	85	95	2	13	5	831	4.16	4	Agreed
5. The removal of fuel subsidy has significantly affected my household's consumption expenditure.	80	90	3	20	7	816	4.08	4	Agreed

Source: Author's survey, 2026

Household Expenditure Before and After Subsidy Removal

Table 7: Household Expenditure Before and After Subsidy Removal

Expenditure Category	Unit	Before Subsidy Removal (₦/Month)	After Subsidy Removal (₦/Month)
Food	Selected food items/kg	Lower	Higher
Petrol/Fuel	₦/litre	₦185 - ₦200	₦1,300
Transportation	₦/km	Lower	Higher
Electricity	₦/kwh	Lower	Higher
Cooking Fuel	₦/kg	Lower	Higher
Housing/Rent	₦/month	Lower	Higher
Education	₦/term or session	Lower	Higher
Healthcare	₦/item/service	Lower	Higher
Clothing	₦/item	Lower	Higher
Communication	₦/GB or ₦/month	Lower	Higher
Other Expenditure	₦/item	Lower	Higher

Source: Field Survey, 2026

Table 7 above showed that household expenditure before and after subsidy removal. Even though the prices of goods and services in Nigeria are affected by higher prices due to the hyperinflation caused by fuel subsidy removal to about 700% increase in fuel/petrol prices, as well as the floating of exchange rate by the Federal Government of Nigeria to about 300% increase for the exchange of Naira to Dollar at Nigerian Stock Exchange Market. Also, since the domestic supply of goods and services is inadequate to meet up the needs and demand, the prices of such products and services have to increase so as to equate the forces of demand and supply as price increases, thereby leading to the reduction of households' demands or household could go for inferior and cheaper goods and services.

Testing Research Hypothesis

The chi-square (Ψ^2) with the application of likert 5 point scale was used fin computations so as to determine the significant relationship in each hypothesis stated in chapter one of this research.

The likert 5 was reduced to three (3) responses for simplicity sake; that is Strongly Agreed (SA) and Agreed (A) would be Agreed (A), Undecided (U) remains the same. While the Disagreed (D) and Strongly Disagreed (SD) become Disagreed (D).

H_0: Fuel subsidy removal has no significant effect on households' consumption expenditure (petrol and transport, cost of living, amount of income, and purchasing power) in Kaduna State, Nigeria.

To test the above hypothesis, the items 1, 2, and 4

Table 8: Testing Hypothesis

Item	Response	Agreed	Undecided	Disagreed	Total
1	FX	580	60	80	720
2	FX	595	45	90	730
4	FX	805	6	31	842
	Total	1980	111	201	2292

Source: Author's survey, 2026

From table 8 above which is observed frequency, the research calculates the expected frequency as:

1, 1: $580 = \frac{1980 \times 720}{2292} = 622.00$

1, 2: $60 = \frac{111 \times 720}{2292} = 34.87$

1, 3: $80 = \frac{201 \times 720}{2292} = 63.14$

2, 1: $595 = \frac{1980 \times 730}{2292} = 630.63$

2, 2: $45 = \frac{111 \times 730}{2292} = 35.35$

2, 3: $90 = \frac{201 \times 730}{2292} = 64.02$

3, 1: $805 = \frac{1980 \times 842}{2292} = 727.38$

3, 2: $6 = \frac{111 \times 842}{2292} = 40.78$

3, 3: $31 = \frac{201 \times 842}{2292} = 73.84$

Table 9: Chi-square Results for Hypothesis One

Item	O	E	O – E	$(O-E)^2$	$(O-E)^2/E$
1,1	580	622.00	-42	1764	2.83
1,2	60	34.87	25.13	631.52	18.11
1,3	80	63.14	16.86	284.26	4.50
2,1	593	630.63	-37.63	1416.02	2.25
2,2	45	35.35	9.65	93.12	2.63
2,3	90	64.02	25.98	674.96	10.54
3,1	805	727.38	77.62	6024.86	8.28
3,2	6	40.78	-34.78	1209.65	29.66
3,3	32	73.84	-41.84	1750.59	23.71
					102.41

Source: Author's survey, 2026

The chi-square calculated Ψ^2 is:

$\Psi^2 = \frac{\Sigma(O-E)}{E} = 102.41$

Therefore, the chi-square calculated is = 102.41

To find chi-square tabulated (Ψ^2) at 5% level of significance and degree of freedom, we have:

Level of significance = 5% (0.05)

Degree of freedom (df) = (row – 1) (column – 1)

= (3 – 1) (3 – 1) = 4

Therefore, the chi-square tabulated (Ψ^2) is = 9.94

Thus, as shown above, the chi-square tabulated (Ψ^2) is 9.49 at 5% level of significance and also at 4 degree of freedom (df)\. While the chi-square calculated (Ψ^2) is 102.41. Hypothesis 1 showed that households' consumption expenditure is negatively affected by fuel subsidy removal in Kaduna State, Nigeria since the chi-square calculated of 102.41 is greater than chi-square tabulated of 9.49; that is $\Psi^2 c > \Psi^2 t$ at 4 degree of freedom and at 5% level of significance.

Therefore, we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1), and then infer that fuel subsidy removal has negative effect on households' consumption expenditures in Kaduna State, Nigeria since the value of calculated chi-square falls at the rejection region.

Table 10 showed that fuel subsidy removal has affected household's consumption expenditure especially on food, goods and services where most household felt their prices cannot longer solve their immediate needs like before, their demand for food, services, housing rent, and other utilities were affected. It is however noted from findings that the things that are considered luxury are no longer given priority, food and services inclusive; and also household on the lower income group reduce their consumption pattern on food and services because there is nothing they can do to increase or to maintain it.

Discussion of Finding

The study revealed that the gender structure of household in Kaduna state, Nigeria. It also shows that there is predominance of men as household heads than female; male constitute 72.5% of the population under study and female with remaining 27.5% of the population. Also, the tables shows that male civil/public servants constituted the highest number of male with 37.93% of male; while private workers, farmers, and traders were with 20.68%, 24.14%, and 17.24% respectively. However, the female farmers and traders have the same number of female given by 18.18% each, while 36.36% and 27.27% were for civil/public and private workers respectively.

The research also depicted that the age structure of households, it also shows that most of the households are within the age of 41-50 years that is 32.5%, followed by 31-40 years which is 28%. Next are Above 51 and 21-30 with 26% and 13.5% respectively. Also, the civil/public servants made up the greatest number of age group with the total number of 80 households responded to 40%, followed by 21.5% and 21% for private firm workers and traders respectively; and finally 17.5% for farmers.

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From the chi-square results analysis revealed that fuel subsidy removal has affected household's consumption expenditure especially on food and services where most household felt their prices cannot longer solve their immediate needs like before, their demand for food, services, housing rent, and other utilities were affected. Thus, as shown above, the chi-square tabulated (Ψ^2) is 9.49 at 5% level of significance and also at 4 degree of freedom (df)\. While the chi-square calculated (Ψ^2) are 102.41.

Therefore, we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1), and then conclude that fuel subsidy removal has negative effect on households' consumption expenditures in Kaduna State, Nigeria since the value of calculated chi-square falls at the rejection region.

The study has shown that household expenditure before and after subsidy removal. Even though the prices of goods and services in Nigeria are affected by higher prices due to the hyperinflation caused by fuel subsidy removal to about 700% increase in fuel/petrol prices, as well as the floating of exchange rate by the Federal Government of Nigeria to about 300% increase for the exchange of Naira to Dollar at Nigerian Stock Exchange Market. Also, since the domestic supply of goods and services is inadequate to meet up the needs and demand, the prices of such products and services have to increase so as to equate the forces of demand and supply as price increases, thereby leading to the reduction of households' demands or household could go for inferior and cheaper goods and services.

CONCLUSION

This research examined the effect of fuel subsidy removal on households' consumption expenditure in Kaduna State, Nigeria over the period May 2023 – May 2026. Specifically, the analysis focused on fuel subsidy and four key questionnaire variables— households' consumption expenditure, households' budget allocation, household's income, and overall households' consumption inflation rate, and oil revenue—while fuel subsidy removal served as the measure of standard and cost of living. Primary data were employed for the analysis. To achieve the study's objectives, both questionnaires were administered, as well as testing hypothesis and econometric techniques were utilized, including the chi-square mode of analysis.

From the chi-square results analysis revealed that fuel subsidy removal has affected household's consumption expenditure especially on food and services where most household felt their prices cannot longer solve their immediate needs like before, their demand for food, services, housing rent, and other utilities were affected. It is however noted from findings that the things that are considered luxury are no longer given priority, food, goods, and services inclusive; and also household on the lower income group reduce their consumption pattern on food and services because there is nothing they can do to increase or to maintain it. However, in light of the aforementioned, the following suggestions were made: First, Kaduna State Government and Federal Government of Nigeria should embark on policies and programmes that will mitigate this policy of fuel subsidy removal through making domestic goods especially food production and services more efficient so as cushion the effect of fuel subsidy removal. Second, Since the inception of the fuel subsidy removal by this administration, household sector has not been adequately received any form of government interventions, so price control board should be established to regulate price fluctuations and high rate of inflation, as well as other institutions that will aid efficient distribution of household products and services should be established.

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