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Impact of Fuel Subsidy Removal on Transportation Cost and the Cost of Agricultural Produce in Bosso LGA

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ABSTRACT
The removal of fuel subsidy has undoubtedly had significant effects on various sectors of the economy. Agriculture, being one of the key sectors of the Nigerian economy has not been left out, due to its dependence on transportation. The study assessed the impact of fuel subsidy removal on the cost of agricultural produce in Bosso Local Government Area of Niger state. The study adopted a quantitative research design relying on secondary data collected from Niger State Bureue of Statistics, the Transportation Unions as well as the Niger State Agricultural and Mechanization Development Authority (NAMDA). Collected data were analysed using Pearson correlation and simple linear regression. The findings revealed that fuel price had significant impact on the cost of food items. It was further revealed that there was positive relationship between fuel price and food prices. The study recommended that the state government should offer targeted subsidies for transportation of agricultural produces and well food prices in order to cushion the effect of fuel subsidy removal.

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INTRODUCTION

Transport plays a crucial role in the agricultural industry by connecting farmers to marketplaces and dealers and enabling the distribution of food. Ovaga and Okechukwu (2022) posit that an increase in transport costs directly affects the prices and availability of agricultural products, and hence on consumer prices and the profit margins of the producers. Since the fuel subsidy was recently removed and the fare rates increased, various sectors of the economy have been changing greatly, and one of the most harmed of them is the agricultural sector (Ozili & Arun, 2023).

Sennuga et al. (2024) posit that the increase in the prices of agricultural products in the market is due to increased transportation expenses that can result in decreased consumption and reduced wealth of farmers.

Bosso LGA which is situated in Niger state is predominantly an agrarian region inhabited by over 200,000 residents, many of whom are smallholder farmers in communities speaking Gbagyi, Hausa and Nupe. Agriculture serves as the backbone of the local economy with produce like maize, rice, millet, yam and groundnut being the most cultivated and transported agricultural produce. These activities depend heavily on affordable and accessible transportation services. However, in the aftermath of subsidy removal, the rising cost of transportation threatens the viability of agricultural trade and the livelihoods of farmers and transporters in the area. Given these issues, this study seeks to assess the impact of fuel subsidy removal on transportation and cost of agricultural produce in Bosso LGA.

LITERATURE REVIEW

Conceptual Review

Fuel Subsidy

Fuel subsidies are a government initiative designed to lower the cost of petroleum motor spirit (PMS), vehicle petrol oil (diesel) and to shield Nigerians from the volatility of crude oil on the global market. Emeh (2012) defines a

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gasoline subsidy as the government's attempt to cover the discrepancy between the product's true cost and the price of fuel at the pump. The government does this by facilitating the sale of petroleum at a reduced price, paying the difference, thereby reducing the burden on its citizens, particularly those with lower incomes. Fuel subsidy in Nigeria was a policy of federal government intended to assist the people of Nigeria to mitigate the effects of their economic hardship. In theory, fuel subsidies aim to increase financial capacity while simultaneously allowing for the implicit financial losses incurred by the government in the course of its national duty to protect the welfare of its citizens (Emeh, 2012).

The Agricultural Economy and Fuel Subsidies

Traditionally, the economy of Nigeria was agrarian in nature where agriculture was an important element of social welfare and economic growth. However, the pre-eminence of the energy sector caused the sidelining of the agricultural sector, which subsequently led to the lack of interest and investment in the section (Abayomi et al., 2015). The withdrawal of the petroleum subsidy impacts the agricultural sector cost structure, production, transportation, and competitiveness in general (Okwanya et al., 2015). In theory, the agricultural sector is either positively or negatively impacted by the proposed of petroleum subsidies. The adverse impact is demonstrated by the rise in the cost of agricultural produce, which is a direct result of the costly transportation costs that are an essential element of logistics. The government is being transparent about its intentions to allocate the funds saved from the elimination of petroleum subsidies for infrastructure improvement.

Theoretical Review

Systems Theory

Ludwig von Bertalanffy developed systems theory in 1968, which sees organization and economies as complex, interdependent systems in a way that every single element affects the others (Von Bertalanffy, 1972). The main assumption in the theory is that a modification in one aspect of the system influences the whole network where there is a need to know all the interrelated components. Regarding this research, one can consider the agricultural supply chain as an interconnected system, which includes farmers, transporters, traders, and consumers as actors in which alterations to fuel prices influence the cost of transport, which subsequently influences all other elements of the chain. The benefit of the systems theory is that it is holistic, which means that researchers are able to take into account bigger economic, social, and environmental interdependencies.

Critics, however, insist that the systems theory can sometimes be too general and not specific to make the exact prediction (Von Bertalanffy, 1972). In addition, it can ignore agency at an individual level placing excess emphasis on structural limitation. In this case, systems theory is especially applicable, as it will be possible to study how the removal of fuel subsidies can be cascaded into the agricultural supply chain. The high transportation cost does not only affect farmers and traders directly, but may also cause more widespread markets access problems, which will affect the availability and prices of food in general (Ameer et al., 2021).

Empirical Review

Empirical evidence shows that the elimination of fuel subsidy has contributed greatly to increasing the cost of transportation thus affecting the agricultural supply chain. Wahab and Idera (2025) conducted a study evaluating how removal of fuel subsidy affected market prices in Kwara State, Nigeria, between May 29, 2023 and January, 2025. The research design employed in the study was a mixed method research design involving both the quantitative and the qualitative designs. Primary data were gathered by way of surveys, interviews, and market observations, and secondary data were procured by referring to official government reports.

The households and market participants were included in the population, but the sampling technique had not been mentioned. Analysis of the data was done through Analysis of Variance (ANOVA) to compare the change in prices in the different sectors and whether the differences

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observed were statistically significant. The results showed that there were great increases in prices especially in areas that are much reliant on fuel, which include transportation and food. This research also showed that the increases were not proportionate and they were more rampant on low-income households with dire economic effects. Results of ANOVA indicated that there were significant differences in the prices of commodities in the periods before removal of subsidies and after removal of subsidies. The authors provided the urgent policy responses such as the introduction of specific subsidies and effective social safety nets that should be introduced to soften the inflationary effect and help vulnerable populations to remain unaffected by economic instability.

Muhammed, et al. (2024) conducted a study to examine the effect of fuel subsidy removal on commodity prices in Sokoto metropolis, Nigeria. The study adopted a quantitative research design using questionnaires administered to 339 respondents within the study area. Ordinary Least Squares (OLS) regression was used as the analytical technique to estimate the relationship between the dependent variable (commodity prices) and independent variables (fuel subsidy removal, transportation costs, and electricity costs). The findings revealed that fuel subsidy removal had a positive and statistically significant effect on commodity prices, implying that increases in energy and transportation expenses due to the removal of subsidies were transmitted to consumers via price hikes in essential goods.

Furthermore, the study established that transportation costs were a major determinant of commodity prices, reflecting the substantial pass-through of logistics expenses. Additionally, electricity costs were found to significantly influence commodity prices, suggesting that energy-related overheads in production and distribution were crucial in shaping price dynamics. The study concluded by recommending improvements in transportation infrastructure and addressing inefficiencies in power generation and distribution as mitigation strategies.

Goji, et al. (2023) conducted a study to examine the effects of fuel subsidy removal on socio-economic services in Lafia Local Government Area of Nasarawa State. The study employed a quantitative survey design with a sample size of 400 respondents drawn from a total population of 586,885 using Yamane's formula. The objectives of the study were to assess the impact of subsidy removal on transportation fares, workers' monthly income, and the general living standards of residents. Data were collected from both primary and secondary sources and analysed using simple percentage statistics presented in tables. Anchored on David Easton's system theory, the study revealed that the removal of fuel subsidy significantly increased the cost of transportation, which in turn led to a rise in the prices of goods and services.

Furthermore, the research indicated that subsidy removal devalued workers' monthly earnings and exacerbated economic hardship among citizens in the area. The study recommended the implementation of palliative measures by the government, the establishment of public transportation systems to ease mobility costs, and an upward review of workers' salaries to cushion the effects of inflation and market price volatility. Abaekih *et al*. (2024) assessed the impact of the removal of fuel subsidy on Nigeria's transportation system. The study adopted a descriptive research design, sampling a total of 70 respondents from 7 licensed motor parks in Anambra state, Nigeria. The study adopted oral interview as well as structured coded sheet as instrument for data collection. The collected data was analyzed using percentages. The study revealed that not only did fuel subsidy have positive impact on transportation system, it also enhances the good performance of the system. The removal of the subsidy however was discovered to have a negative effect on the transportation system as it reduced the rate of revenue generated, and increased the cost of transportation.

It was however discovered that the rate of maintenance reduced as well as reduced long-distance travels. The study recommended a combination of several strategies such as capacity

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building, infrastructure investments, collaboration between stakeholders as well as targeted assistance to reduce and minimize the effects of fuel subsidy removal.

Sennuga *et al* (2024) assessed the impact of the removal of fuel subsidy on agricultural production among smallholder farmers in Bida and Borgu Local government areas of Niger state. The study adopted a descriptive research design focusing on farmers within the selected local governments. The study then adopted multistage sampling technique to select 120 smallholder farmers for the study. Interview and structured questionnaires were adopted for data collection. Information collected involved data on socio economic characteristics of the farmers, effect of subsidy removal on marketing and relationship between transportation cost and marketing.

The collected data were analysed using descriptive statistics and inferential statistics. Frequencies, percentages and Logit regression techniques were utilized for data analysis. The study revealed that the removal of subsidy has resulted in increased cost of transportation which has in turn resulted in higher cost of agricultural produce. The study further revealed that accessibility and marketing of agricultural produce have been negatively affected by the subsidy removal. The study therefore, suggested the introduction of transport subsidy for rural smallholder farmers as well as relocation of farm markets to more accessible and nearer areas to reduce transportation costs and other accessibility challenges.

METHODOLOGY

This study adopted a quantitative research design. The study relied on secondary data comprising of 9 years (2016 – 2024) data on fuel pump price and cost of transportation of agricultural produce to markets were collected from Niger State Bureue of Statistics and the Transportation Unions respectively, while a 9 years data from 2014 to 2023 on the average cost of food items was collected from Niger State Agricultural and Mechanization Development Authority (NAMDA). The collected data were analysed using trend analysis. Graphs and tables were adopted for data presentation while Pearson correlation was adopted to measure the relationship between Fuel Price (Naira per litre) and Cost of Agricultural Produce (Per Kilogram) while simple linear regression analysis was used to examine the relationship between fuel price and average food price.

RESULTS

Impact of Fuel Price increase on Transportation Fare

Figure 1 shows the monthly increase in fuel price and its effect on the monthly fare price. From January to April, 2023, the price of fuel and transport fare had maintained a steady and stable price with very little changes. This however changed in June 2023 corresponding with the removal of fuel subsidy which occurred on the 31st of May, 2023. The relationship however witnessed continuous change over the subsequent months, thereby indicating that other factors asides fuel price affected fare rates as indicated in the graph where the cost of fuel in August, 2024 kept rising while transport fare cost witnessed a sharp fall before increasing again in September, 2024.

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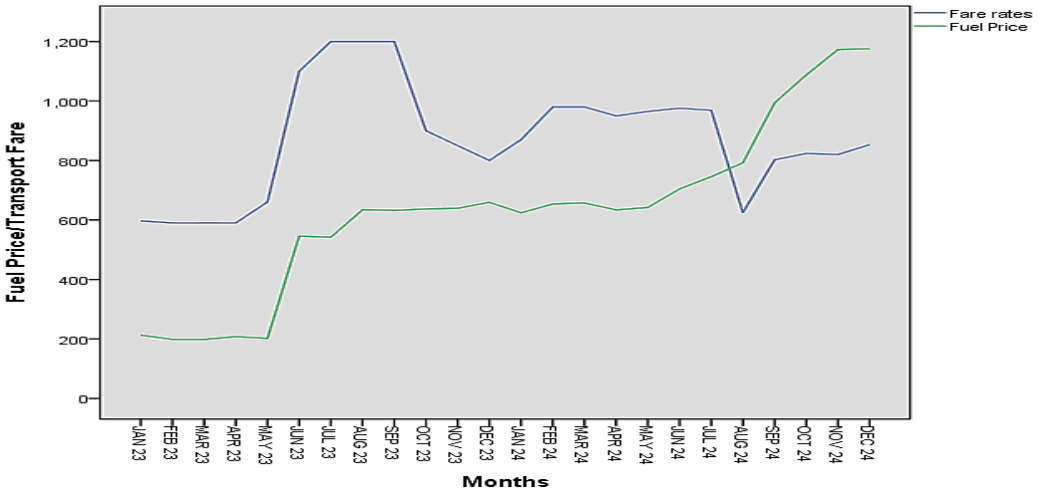

Figure 1: Fuel Price and Transport Fare Changes in Niger state from January, 2023 – December, 2024
Source: Author's Survey (2025)

This finding shows the close relationship between the removal of fuel subsidy and hike in fare price. The effects of the subsidy removal are far-reaching as it might result in food scarcity as increased operation cost might prevent farmers, transporters or traders to produce, move or purchase the usual quantity or quality of agricultural produces. As presented in Figure 4.8, the impact of fuel subsidy removal on fare price extends to the cost of food items. This increased cost is likely to threaten food security as well as the ability of stakeholders within the agricultural sector to attain sustainable livelihood.

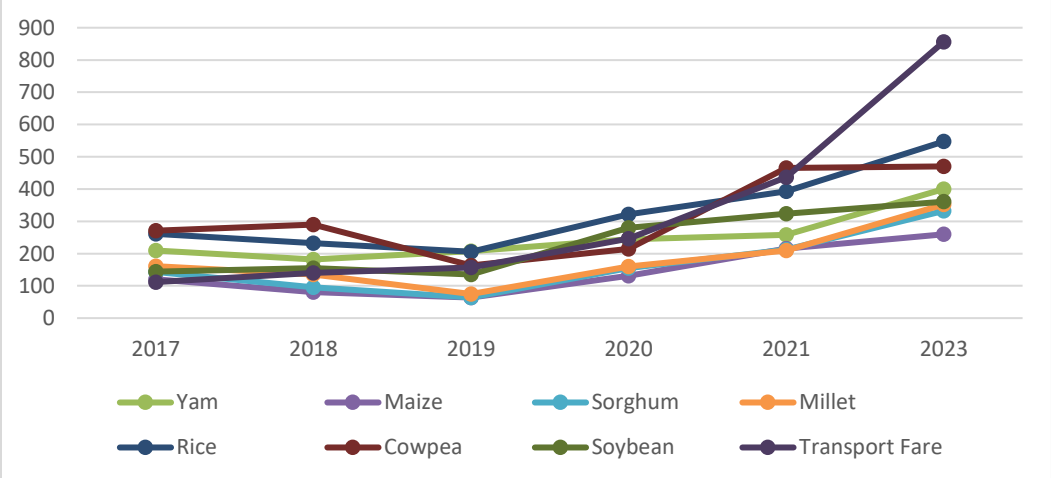

Figure 2: Relationship between Transport Fare and Cost of Food Items
Source: Author's Survey (2025)

In Figure 2, the relationship between transport fare and the cost of food items from 2017 to 2023 is analysed. This analysis sought to explain the level of impact the cost of transportation had on the agricultural supply chain, with specific focus on the cost of food items. The result revealed that there was a consistent

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rise in both transport fares and food prices over the years observed. For example, when the average transport fares increased from ₦111.78 in 2017 to ₦856.48 in 2023, the price of staple food items recorded significant increments. Yam, for example increased from ₦209.62/kg to ₦400.13/kg, rice from ₦261.32/kg to ₦547.38/kg, and beans from ₦271.01/kg to ₦470.16/kg. This indicates that the increase in transport fare contributed significantly to food inflation in Bosso LGA. It is important however to point out that the increase in transport fare might not be as a direct result of increase in fare price or removal of fuel subsidy, as other factors such as poor road conditions, and increased vehicle maintenance costs could contribute.

This result therefore reinforces the significance of transportation as a critical determinant of food availability, accessibility and affordability in the agricultural supply chain This finding there implies that improvement to the transport system, adoption of alternative fuel or even subsidization transport fares for agricultural products could significantly mitigate food price instability and insecurity.

Relationship Between Fuel Price and Cost of Food Items

The relationship between fuel price and cost of food items has been one of great concern, especially since the removal of fuel subsidy. Figure 3 presents a line graph explaining the relationship between fuel price changes and food price changes from year 2015 to 2021 and then 2023. From the visual analysis, it was noticed that over the years, with every change in fuel price, there is usually a corresponding change in the cost of some food items. For example, for every increase in fuel price from 2016 onward, the food prices also increased responding to the upward surge in fuel prices. In 2023 when the average price of fuel reached ₦442.47 following the withdrawal of fuel subsidy, the cost of food items increased accordingly, with all of them reaching their maximum values. As an example, yam increased to ₦400.13/kg, rice to ₦547.38/kg, and beans to ₦470.16/kg. It is a pointer that the price fluctuations in the fuel price had a serious impact on the price of these food items, perhaps because of the input costs of the fuel price such as mechanisation, irrigation and post-harvest processing such as transportation and storage.

Table 1. Changes in Fuel price and Food price from 2015 to 2021 and 2023

Years	Fuel Price (₦/Litre) y	Yam (₦/Kg) x1	Maize (₦/Kg) x2	Sorghum (₦/Kg) x3	Millet (₦/Kg) x4	Rice (₦/Kg) x5	Soybean (₦/Kg) x6	Cowpea (₦/Kg) x7
2015	110.61	115.75	41.78	43.01	51.77	148.95	113.92	136.66
2016	137.21	176.15	92.60	110.55	110.11	215.57	134.39	213.33
2017	148.39	209.62	120.29	143.36	160.72	261.32	144.21	271.01
2018	151.15	181.78	80.64	95.39	135.56	232.22	154.59	289.96
2019	145.74	207.66	63.74	63.99	74.73	205.71	135.26	163.34
2020	148.11	244.02	131.49	154.53	160.22	321.55	280.03	214.50
2021	167.50	258.26	215.38	212.21	209.22	392.59	323.56	465.77
2023	442.47	400.13	259.76	332.30	352.02	547.38	360.85	470.16

Source: Niger State Bureau of Statistics

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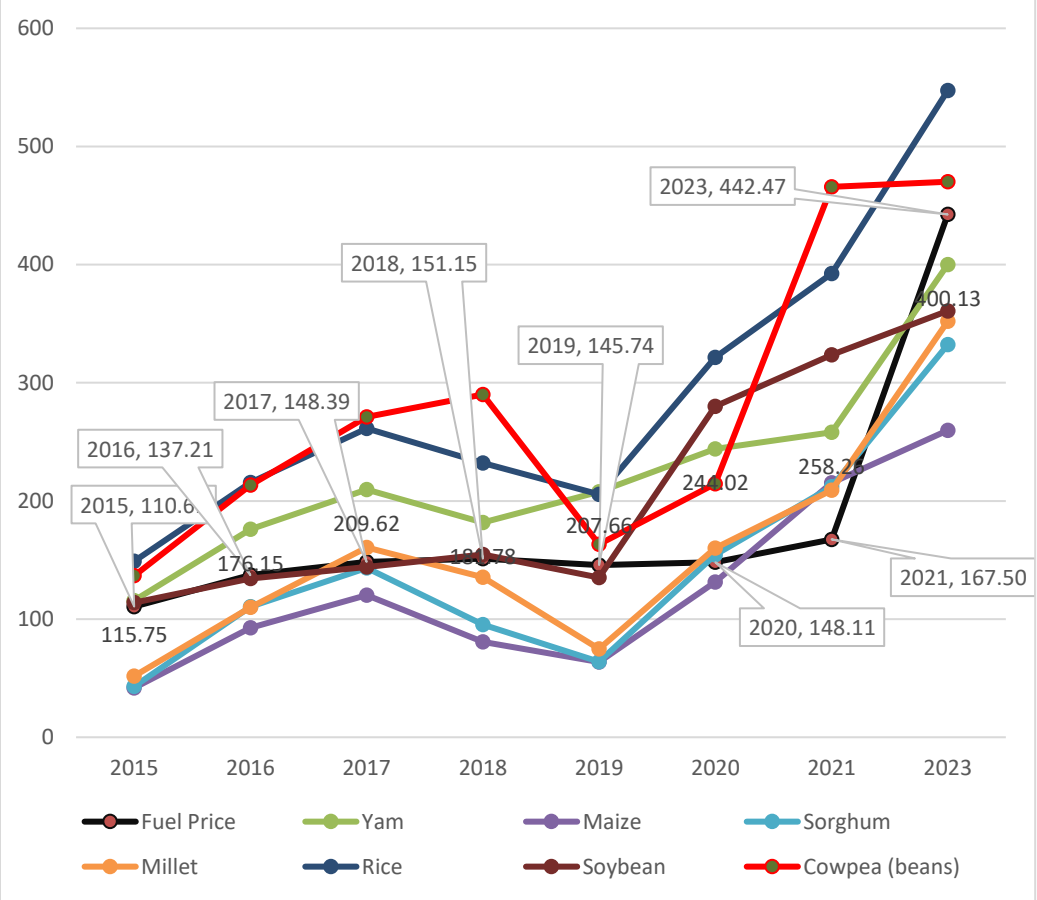

Figure 3. Relationship between fuel price changes and cost of major food items in Bosso LGA

Figure 3. Correlation between fuel price fluctuations and price of key food stuffs in bosso LGA. The results of Pearson correlation (refer to Table 2) supported this conclusion of the line graph in Figure 3 by showing the nature of the relationship between the fuel price and the cost of individual food item. This analysis has shown that most of the food items were highly and positively correlated to the fuel price. To be more precise, it was found that there is a very strong and statistically significant correlation between fuel price and yam (r =.913, p =.002), maize (r =.791, p =.019), sorghum (r =.877, p =.004), millet (r =.902, p =.002), and rice (r =.876, p =.004), meaning that as the fuel prices grow, so do the prices of the above foodstuffs. The correlation with soybean price (r =.706, p =.050) and cowpea price (r =. 698, p =.054) were correlations that were not statistically significant but relatively significant. This implies that even though there was a positive correlation between prices of all foods and fuel price, the relationship was not equally strong and significant based on commodities.

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Table 2. Pearson Correlation measuring the relationship between Fuel Price (Naira per litre) and Cost of Agricultural Produce (Per Kilogram)

		Fuel	Yam	Maize	Sorghum	Millet	Rice	Soybean	Cowpea
Fuel	Pearson Correlation	1	.913**	.791*	.877**	.902**	.876**	.706	.698
	Sig(2-tailed)		.002	.019	.004	.002	.004	.050	.054
	N	8	8	8	8	8	8	8	8

**. Correlation is significant at the 0.01 level (2-tailed).

***. Correlation is significant at the 0.05 level (2-tailed).**

Source: Author's Computation (2025)

Regression analysis was also done based on the data in Table 3 to find the impact of fuel price on the average food item cost in Bosso LGA. The outcome in Table 4 showed that there was a very strong and positive correlation between the food price and the fuel price with an R value of 0.849 that high fuel price increases food price. The results also indicated that fuel price significantly influences food price in the form of R squared of 0.720 which translates to the fact that fuel price explain about 72% food price variation. The analysis also determines that the regression model is statistically significant at a p-value of 0.008 at 5% level, that is, the relationship between fuel price and cost of food item did not arise randomly. Instead, the influence of the fuel price, the independent variable, has a considerable contribution to the variation of the cost of food items.

Table 3: Summary of Fuel Price and Average Food Price in Bosso LGA from 2015 to 2023

Years	Average Cost of Food Item in Naira (y)	Fuel Price in Naira (x)
2015	93.12	110.61
2016	150.39	137.21
2017	187.22	148.39
2018	167.16	151.15
2019	130.63	145.74
2020	215.19	148.11
2021	296.71	167.50
2023	388.94	442.47

Source: Niger State Agricultural and Mechanization Development Authority (NAMDA) and Niger State Bureau of Statistics.

Table 4: Summary of Simple Linear Regression Analysis Showing the Relationship between Fuel Price and Average Food Price

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
1	.849[a]	.720	.673	55.12868	15.424954	0.008[b]

a. Dependent Variable: Average Food Price
b. Predictors: (Constant), Fuel Price

Source: Author's Survey (2025)

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These findings are consistent with the findings of Sennuga et al (2024); Onwuaroh et al (2024) and Ngene et al (2023) that fuel price, a subset of transportation and logistics cost, exert huge strain on the cost of food items since it influences increased cost of production, distribution and retailing. Such an outcome, hence, suggests that fuel price is a significant factor in the determination of the price of food products in Nigeria. The moderate positive correlations reported shows that as fuel prices increase, food prices can be observed to change by a significant margin and this could be because of the increased cost of transporting, farming inputs, and distributing food. This is very significant to food security and the cost of living, particularly among the poor families. The introduction of strategies like subsidies of fuel used in agricultural operations or investments in alternative energies to be used in the transportation and farming industry can be used to mitigate the effect on food prices.

CONCLUSION AND RECOMMENDATION

The study concludes that fuel subsidy removal has had significant impact on transportation and the cost of agricultural produce in Bosso LGA. Specifically, it contributed to hike in fare prices which in turn resulted in higher cost of production of agricultural produces, further resulting in increased cost of food items. The study therefore recommends that government should provide targeted subsidies for transportation of agricultural products and produces in order to cushion the effects on the economy and citizens.

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