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FUEL SUBSIDY REFORM AND PRICE TRANSMISSION IN INFORMAL URBAN FOOD SYSTEMS: EVIDENCE FROM BENIN METROPOLIS, NIGERIA

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ABSTRACT: This study examined the effects of the removal of fuel subsidies in May 2023 on transportation costs, commodity prices, and traders' livelihoods in urban informal markets in Benin Metropolis, Nigeria. Data were collected from 364 traders in the Oba and Uselu markets and analysed using descriptive statistics, Pearson correlation, paired-sample t-tests, and simple linear regression. The results revealed a substantial increase in transportation costs following subsidy removal, while traders' average monthly profit declined by ₦40,491. However, regression analysis showed that increases in transportation costs did not significantly predict changes in commodity prices, indicating weak or incomplete price pass-through within the market system. Despite the limited transmission of commodity prices to the broader economy, traders experienced a notable decline in profit levels, suggesting that part of the cost shock was absorbed internally rather than passed on to consumers. Correlation analysis further revealed a moderate positive relationship between household income and subsidy-related economic pressure, highlighting greater vulnerability among lower-income traders. By integrating Price Pass-Through Theory with the Sustainable Livelihoods Framework, the study demonstrates that informal urban markets serve as critical arenas in which macroeconomic policy shocks are mediated through traders' adaptation, competitive pricing behaviour, and livelihood adjustments. The findings highlight the need for policy reforms, such as fuel subsidy removal, to be accompanied by targeted support measures, including improved transport systems, trader support programmes, and phased policy implementation, in order to reduce economic vulnerability and strengthen the resilience of urban food distribution systems in developing economies.

Keywords: Fuel Subsidy Reform, Urban Market Systems, Household Vulnerability, Staple Foods Prices, Traders' Livelihood, Price Pass-Through Theory

INTRODUCTION

Nigeria's economy reflects a long-standing paradox of oil abundance and widespread economic hardship. Despite being a major oil producer, households continue to face high living costs, particularly in fuel and food markets. In May 2023, the Federal Government removed the long-standing fuel subsidy, triggering widespread adjustments across transport systems, agricultural production, and urban markets. Urban markets in Benin Metropolis, particularly Oba and Uselu, function as critical nodes where supply chains, transport costs, and household consumption intersect. In such spaces, economic shocks are quickly transmitted and felt most sharply by traders

and low-income households. This study is situated within that reality, focusing on how households operating within narrow economic margins experience disproportionate vulnerability to financial shocks.

For decades, fuel subsidies were used to stabilise transport costs, support agriculture, and shield consumers from global oil price volatility. However, concerns over fiscal burden, inefficiency, and governance challenges have fuelled arguments for reform (Kim & Samudro, 2021; Ozili & Obiora, 2024; Sambo & Sule, 2024; Adebogun, 2024). Proponents argue that subsidy removal reallocates public resources toward infrastructure, health, and education, while improving market efficiency (Ozili & Obiora, 2024; Adebogun et al., 2024). Despite these arguments, evidence on real-world welfare outcomes remains mixed.

Macro-level studies suggest that subsidy removal reduces real incomes, suppresses demand, and intensifies inflationary pressures, particularly among poorer households (World Bank, 2015; Siddig et al., 2015). Other studies link it to rising poverty and social distress (Njoku & Mmougbuo, 2025). However, most of this evidence remains aggregated at national level or based on modelling approaches (Onifade et al., 2023; Ozili & Obiora, 2024), with limited attention to how these shocks unfold within local market systems.

This gap is particularly important in Benin Metropolis, where informal trade, transport dependence, and fragmented supply chains may intensify the effects of price shocks. This study therefore provides a place-based analysis of how subsidy removal affects staple food prices, agricultural production, trader profits, buyer behaviour, and livelihoods. It traces how a national policy translates into lived economic realities within urban informal markets.

The study is guided by the aim of examining the impacts of fuel subsidy removal on key economic and livelihood indicators in Benin Metropolis, Nigeria. Specifically, investigates the effects of fuel subsidy removal on transportation costs, commodity price transmission, trader profitability, and household livelihood conditions within informal urban markets in Benin Metropolis. It specifically assesses the rate of price pass-through from transport costs to commodity prices and examines how the resulting cost shocks affect trader margins and income stability. The objectives focus on measuring price effects across sectors, determining impacts on trader profits, and evaluating broader livelihood consequences.

Beyond its empirical focus, the study contributes to debates on price transmission and informal market dynamics in developing economies. It argues that cost shocks do not always pass fully into final prices but are often absorbed within the market system through reduced trader margins. This highlights the role of informal market structures in shaping incomplete pass-through and uneven burden distribution.

The study is significant for three reasons. Academically, it extends local-level evidence on subsidy reform beyond macroeconomic modelling. For policymakers, it provides evidence to support targeted interventions and social protection measures. For communities and development actors, it documents the lived experiences of traders and farmers facing rising costs and declining incomes, offering insights for more grounded support strategies.

Although focused on Benin Metropolis, the study speaks to a wider question in developing economies: how informal markets absorb and transmit macroeconomic shocks under conditions of structural constraint. It therefore contributes to a broader understanding of price formation, cost absorption, and livelihood vulnerability in urban informal systems.

Theoretical Framework

The study draws on two key theoretical lenses: the price pass-through theory and the sustainable livelihoods framework. These provide both an economic and a social understanding of how the removal of fuel subsidies shapes markets, production, and daily survival in Benin Metropolis.

Price Pass-Through Theory

The price pass-through theory originates from international trade and microeconomic analysis. Early applications by Krugman and Obstfeld in the 1990s explained how changes in input costs, tariffs, and exchange rates are transmitted to consumer prices (Krugman & Obstfeld, 1991). It was later refined in studies of industrial organisation and pricing behaviour, particularly in relation to energy markets where fuel acts as a core production input (Goldberg & Knetter, 1997). Subsequent extensions to developing economies show that structural inefficiencies and weak competition often intensify pass-through effects, especially in fuel-dependent sectors (Coady et al., 2015).

At its core, the theory assumes that increases in input costs are transmitted through the production and distribution chain to final consumers. In highly competitive markets, this transmission is typically complete, while in less competitive settings it becomes partial as firms absorb part of the cost to retain demand. The extent of pass-through is therefore shaped by market structure, demand elasticity, and the availability of substitutes (Burstein & Gopinath, 2014). Where essential goods have limited substitutes, households face greater exposure to cost shocks, particularly low-income groups whose consumption is concentrated on basic commodities.

In Nigeria, fuel functions as both a production and distribution input across transport, agriculture, and retail systems. The 2023 subsidy removal led to a sharp increase in fuel prices, which, according to pass-through logic, translated into higher transport costs and subsequently higher food and living costs. Empirical studies confirm strong correlations between fuel price movements, transport costs, and food inflation in Nigerian cities (Onifade et al., 2023; Njoku & Mmougbuo, 2025). This mechanism is especially pronounced in Benin Metropolis, where reliance on road transport and informal trade structures accelerates the transmission of costs in the absence of strong regulatory buffers.

This study applies the price pass-through theory to explain the relationship between fuel price changes and the prices of staple commodities such as rice, garri, and beans. It uses statistical analysis to examine how subsidy removal translates into inflationary pressures across markets. Beyond measuring these effects, the study considers how differences in demand elasticity across commodities shape household exposure to price changes. Staple goods with fewer substitutes tend to exhibit stronger and more immediate price responses, thereby increasing vulnerability among low-income households in Benin Metropolis.

Sustainable Livelihoods Framework

The sustainable livelihoods framework (SLF) emerged in the 1990s through the UK's Department for International Development (DFID), building on earlier contributions by Chambers and Conway. It reoriented poverty analysis away from income alone toward a broader view of how people combine resources and strategies to sustain their lives (Chambers & Conway, 1992; DFID, 1999). It has since become widely used in development research, particularly in contexts where households depend on multiple, overlapping means of survival.

The framework is built on the assumption that livelihoods depend on five forms of capital: human, natural, social, financial, and physical. These assets are shaped by vulnerability contexts such as economic shocks, policy changes, and environmental stress. Institutional structures and power relations further determine access to these resources (Scoones, 1998). Livelihoods are therefore dynamic, constantly adjusted in response to risk and opportunity. A shock, such as fuel subsidy removal, disrupts this balance, forcing households to reallocate resources or reduce consumption depending on their asset base.

In Nigeria, the SLF helps explain the differentiated responses to the removal of fuel subsidies across farmers, traders, and transport operators. Rising fuel costs increase production and distribution expenses, reducing financial capital and straining physical inputs such as transport and irrigation systems. Farmers adjust by reducing input use or output scale, while traders experience declining margins and weaker demand. Households respond through borrowing, consumption cuts, and income diversification (Olayemi, 2012; Adepoju & Oni, 2020). In Benin Metropolis, these responses are often supported by informal institutions such as market associations and cooperatives, which provide social capital during periods of stress, although their capacity weakens under prolonged shocks.

This study applies the SLF to examine how households in Benin Metropolis reorganise their livelihoods following fuel subsidy removal. It integrates quantitative indicators such as income, expenditure, and consumption with qualitative evidence on coping strategies and social networks. This approach allows for a fuller understanding of how financial, human, and social capital are affected by the shock, and how different groups adapt or become increasingly vulnerable over time.

Integrating the Two Frameworks

The combined use of the price pass-through theory and the sustainable livelihoods framework enriches the study's analysis. The first provides the economic explanation for rising staple foods prices, while the second provides a social explanation of how individuals and households experience and respond to those changes. Integrating these two perspectives within the context of urban market systems is particularly useful. Markets in cities such as Benin Metropolis are not just sites of exchange but urban facilities that mediate between external shocks and household welfare. They operate as nodal points where transportation costs, supply chains, and consumer demand intersect, making them central spaces for observing both price transmission and livelihood adaptation. Positioning markets as critical urban facilities thus allows the study to bridge theoretical insights with the lived realities of traders and households. In the context of Benin Metropolis, this

dual framework captures both the market logic of inflation and the human dimension of survival in the face of economic shocks. See Figure 1 for the link between pass-through theory and sustainable livelihood.

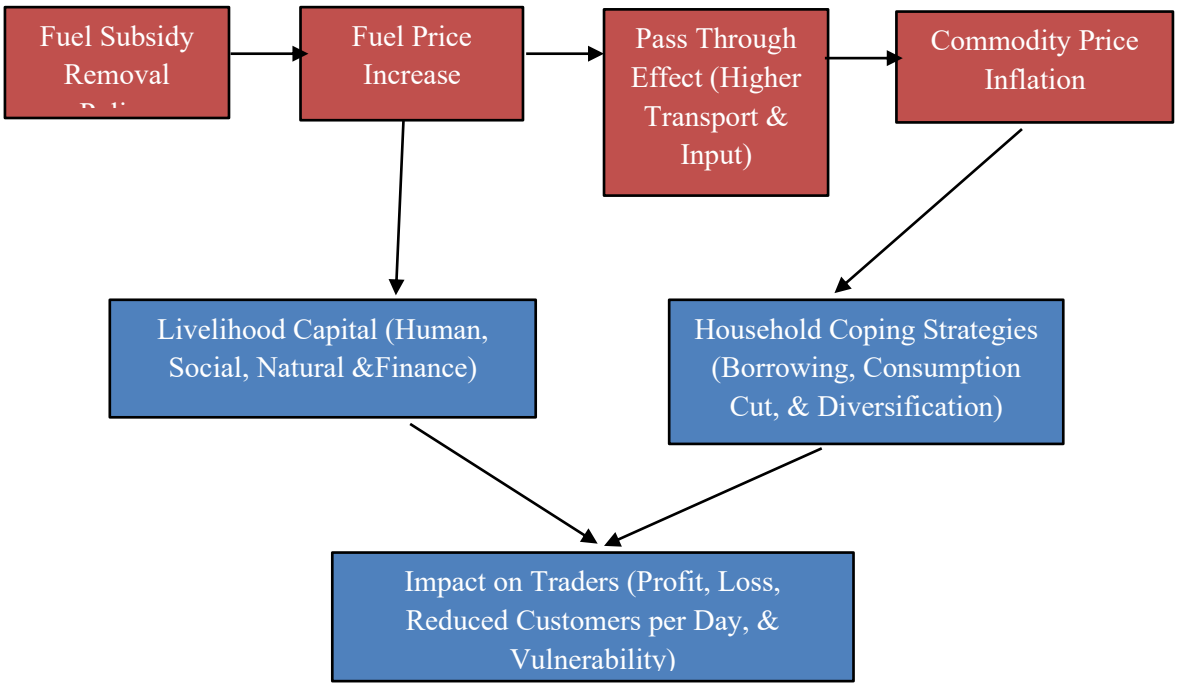

Figure 1: *Conceptual Framework Linking Price Pass-Through Theory and the Sustainable Livelihoods Framework in Analysing the Impacts of Fuel Subsidy Removal*

Source: Authors' Abstraction, 2025.

LITERATURE REVIEW

Price Effects and the Pass-Through Mechanism

A growing body of evidence shows that fuel price shocks quickly translate into higher staple food prices in Nigeria. State and national studies confirm strong links between petrol prices, transport costs, and food inflation, with high pass-through where road transport dominates (Obasi, 2024; Onifade et al., 2023). This effect is stronger in markets with weak infrastructure, limited competition, and few substitutes for essential goods (Burstein & Gopinath, 2014).

The transmission operates mainly through rising transport and input costs, driving inflation across food systems. Comparative evidence supports this channel. In Malawi, higher diesel prices reduced fertiliser use by 30% after subsidy removal, worsening food insecurity (Chirwa & Dorward, 2013). In Kenya, increased fuel costs raised irrigation and transport expenses, weakening smallholder competitiveness (Arndt et al., 2008). These cases show that without supporting infrastructure and input policies, supply chains and rural–urban linkages deteriorate. Empirical modelling further

confirms persistent inflationary effects, with rural areas experiencing stronger impacts due to dependence on diesel-based transport systems (Ani et al., 2021).

Evidence from micro-level retail analysis further clarifies how price pass-through operates in practice. Studies using firm-level data show that customer turnover is highly sensitive to pricing decisions, particularly where buyers can easily switch between suppliers (Paciello et al., 2019). In such markets, demand exerts pressure on firms to adjust prices cautiously, as retaining customers often takes precedence over full cost recovery. This produces incomplete pass-through, with more efficient firms able to transmit a larger share of cost increases than less efficient ones. The evidence also shows that demand is more persistent than prices, reflecting firms' preference for stable customer relationships over frequent price adjustments. Overall, price transmission is shaped by consumer behaviour, firm heterogeneity, and competition rather than mechanical cost transfer.

In Nigeria, this dynamic is visible in the pricing of staples such as rice, garri, and beans, where households have limited substitution options. Prices tend to adjust rapidly after fuel price changes, particularly in transport-dependent and poorly regulated markets (Obasi, 2024). Following the 2023 subsidy removal, fuel prices rose sharply, with immediate increases in transport fares, storage costs, and food prices across major cities (Maih, Omotosho & Yang, 2024). This effect was especially pronounced in Benin Metropolis, where reliance on road transport and informal supply chains accelerated cost transmission and intensified household budget pressure.

Empirical evidence supports this pattern. In Kwara State, staple food prices increased by 25–40% within three months, driven by a 200% rise in haulage costs (Ozili, 2023). A structural vector autoregression (SVAR) analysis further shows that a 1% increase in petrol price leads to a 0.6% rise in transport costs and a 0.4% pass-through to consumer prices (Raifu & Oshota, 2023). Comparative evidence reinforces the importance of policy design. In Indonesia, gradual subsidy reforms combined with social support limited inflation to below 10% (Dartanto, 2013). Ghana's partial reform cushioned vulnerable groups through targeted tariffs while improving fiscal balance (Coady et al., 2010). By contrast, abrupt reforms in Zambia resulted in food price increases exceeding 20%, worsening urban poverty (Chepeliev, 2020). The Philippines' phased approach suggests that smoother adjustments can reduce inflationary spikes by 15–20% (Akpan & Nwafor, 2023). Overall, the literature shows that while pass-through improves market efficiency, it intensifies vulnerability in import-dependent economies such as Nigeria, where fuel accounts for a significant share of logistics costs.

Traders' Profits and Market Dynamics

Research focused on traders, especially small and medium market vendors, shows that profits often decline after subsidy removal, because traders cannot always pass the full cost increase to buyers. A study in Takum LGA in Taraba State found a severe impact on trading and marketing activity during the months following the subsidy removal. Many traders reported loss of customers, increased costs, and squeezed margins (Shipurut, Onyedikachi & Abubakar, 2024). Small and medium enterprises (SMEs), which dominate Nigeria's informal trading sector, face squeezed margins as transportation costs, now up 200-300%, erode profitability by 15-25% (Oyasipe & Olukoya, 2024). A case study in Lagos revealed that entrepreneurial businesses experienced a 20%

decline in sales and an 18% reduction in profits post-2023 removal, attributed to higher logistics expenses and consumer pullback (Oyasipe & Olukoya, 2024). In Takum LGA, Taraba State, traders reported disrupted supply chains, with fuel price spikes causing a 30% drop in daily customer volume and persistent profit losses into 2024 (Shipurut et al., 2024).

Market dynamics have shifted toward oligopolistic tendencies, where major marketers control imports, potentially inflating prices via vested interests, as noted in a computable general equilibrium (CGE) analysis (Akingbade, 2023). Positive aspects include incentivised domestic refining, potentially reducing import dependence and fostering competition, but short-term smuggling to neighbouring countries has intensified, diverting 20-30% of subsidised fuel pre-removal (Ozili & Obiora, 2023). Literature from the 2012 partial removal echoes these patterns, showing a 10-15% contraction in informal markets due to volatility (Akingbade, 2023). Comparative evidence from Egypt's 2014 reforms shows similar market consolidation, where larger firms absorbed shocks more easily than SMEs, leading to increased informality in retail sectors (Sdralevich et al., 2014). In contrast, Morocco's phased removal (2013–2015), paired with competition oversight, reduced such risks, allowing SME traders to adapt without severe profit loss (Verme & El-Massnaoui, 2015).

Livelihoods, Coping Strategies and Vulnerability

The sustainable livelihoods literature frames how households respond to shocks by mobilising or depleting different forms of capital (human, natural, social, financial, physical) (Chambers & Conway, 1992; Morse, 2025). When fuel or food cost shocks are experienced through markets, households reconfigure strategies, selling assets, borrowing, reducing consumption, and diversifying income streams to survive (Njoku, 2025).

Studies in Nigeria and sub-Saharan Africa document that after subsidy or agricultural shocks, many rural and urban households first reduce non-food spending, then scale back food portions, withdraw children from school, or postpone medical care (World Bank, 2015; Bakare et al., 2024). Social networks play a critical role: extended family, cooperatives, and community associations often act as informal safety nets. In Nigeria's volatile environment, shocks can be cumulative. Fuel subsidy reform may coincide with currency devaluation, insecurity, or inflation. These overlapping stressors push households into chronic vulnerability. A study in Bauchi State, for instance, measured livelihood vulnerability resilience capacity and found that asset buffers and adaptation strategies influence whether households bounce back or sink deeper (Sadiq et al., 2024).

A 2024 ODI study found lower-income households (bottom quintile) facing 2-3% welfare losses, with 54% below the poverty line pre-removal now rationing food (30% reduction) and borrowing (up 25%) (Oluwaseun & Arun, 2024). Women and rural dwellers are most affected, with kerosene-dependent cooking costs rising 50%, per gender analyses (Ozili, 2023). Coping includes diversification (e.g., backyard farming) but increases debt vulnerability (McCulloch et al., 2021). Literature from the 2012 reforms shows similar patterns: 20% income drops for informal workers, partially mitigated by SURE programs in 16 states (Arze del Granado et al., 2012). Internationally, Egypt's reform experience also revealed that cash transfers cushioned urban poor but rural households relied more on informal borrowing and asset sales (Sdralevich et al., 2014). In Jordan,

targeted compensation schemes prevented a significant welfare collapse during 2005 reforms, highlighting the importance of well-designed social safety nets (IMF, 2013).

Policy Responses and Mitigation Measures

Governments and agencies globally, including in Nigeria, have proposed mitigations to soften the hardship during subsidy reform. Comparative literature suggests that pairing subsidy removal with targeted cash transfers, transport subsidies for agricultural produce, or alternative energy programmes helps cushion low-income groups (Maih et al., 2024). Such measures prevent the worst acute pain and maintain social buy-in.

In Nigeria, post-reform proposals include converting vehicles to compressed natural gas (CNG), subsidised transport for farm produce, and small grants to market actors (Society of Petroleum Engineers, 2024). Yet implementation lags, and many palliatives remain untargeted or underfunded (Ozuzu & Jafaar, 2025). Without effective design, such interventions often miss the most vulnerable, worsening inequality. Another strategy is the gradual or phased removal of a subsidy, coupled with gradual price adjustments, allowing market actors to adapt slowly (Akinteye, 2025). Some argue that differential subsidies focused on rural/agricultural users rather than a blanket fuel subsidy could be more efficient and equitable (Maih et al., 2024).

Evidence from Ghana's 2005 reform shows that linking subsidy removal with visible investments in education and health bolstered public support (Coady et al., 2010). Indonesia's reform success in 2014–2015 hinged on conditional cash transfers that reached nearly 19 million households (Dartanto, 2013). In contrast, Yemen's failed attempt in 2014, where reforms coincided with political instability, triggered protests and a reversal of policy (IMF, 2014). These comparisons emphasize that Nigeria's success depends not just on fiscal savings but also on transparent and inclusive reinvestment of subsidy revenues.

Study Area

Benin City, the administrative capital of Edo State, lies in the southern senatorial district of the state between latitudes 6°16′ and 6°33′N and longitudes 5°31′ and 5°45′E (Egharevba & Otabor-Olubor, 2023; Egharevba & Edohen, 2025). The metropolis covers five of the city's seven Local Government Areas, with a territorial extent of about 1,318 km², of which 166 km² lies at an elevation of 78 metres above sea level (Ekhaese et al., 2014). The city is situated within the humid tropical rainforest zone of Nigeria. Its climate lies within the equatorial belt (Af classification in Köppen's system), with annual rainfall exceeding 2,000 mm, a mean temperature of 28°C, and relative humidity around 80% (Odjugo, 2012). Rainfall has a double maxima regime, interrupted by the "August break," and the rainy season spans from March/April to October/November.

The indigenous Edo people form the aboriginal population, speaking the Edo language and related dialects. They are renowned for their vibrant cultural heritage expressed through traditional dress, beads, body marks, raffia work, and subsistence farming. According to the Edo State Statistical Year Book (2013), Benin City had a population of 1,844,000, projected to reach 2,521,832 by 2023.

Agriculture remains central to the local economy, with yams, cassava, rice, maize, and oil palm as staple crops, while rubber, timber, and palm products serve as cash crops.

Strategically, Benin City is a nodal hub connected by major highways such as the Benin-Lagos, Benin-Auchi, Benin-Asaba, and Benin-Sapele roads. A bypass links these arterial routes, while nine major roads radiate from the King's Square in concentric and sectoral patterns. This network enhances Benin's role as a major collection and distribution centre for goods and services. See Figure 2 for the study area showing the location of Oba and Uselu Market.

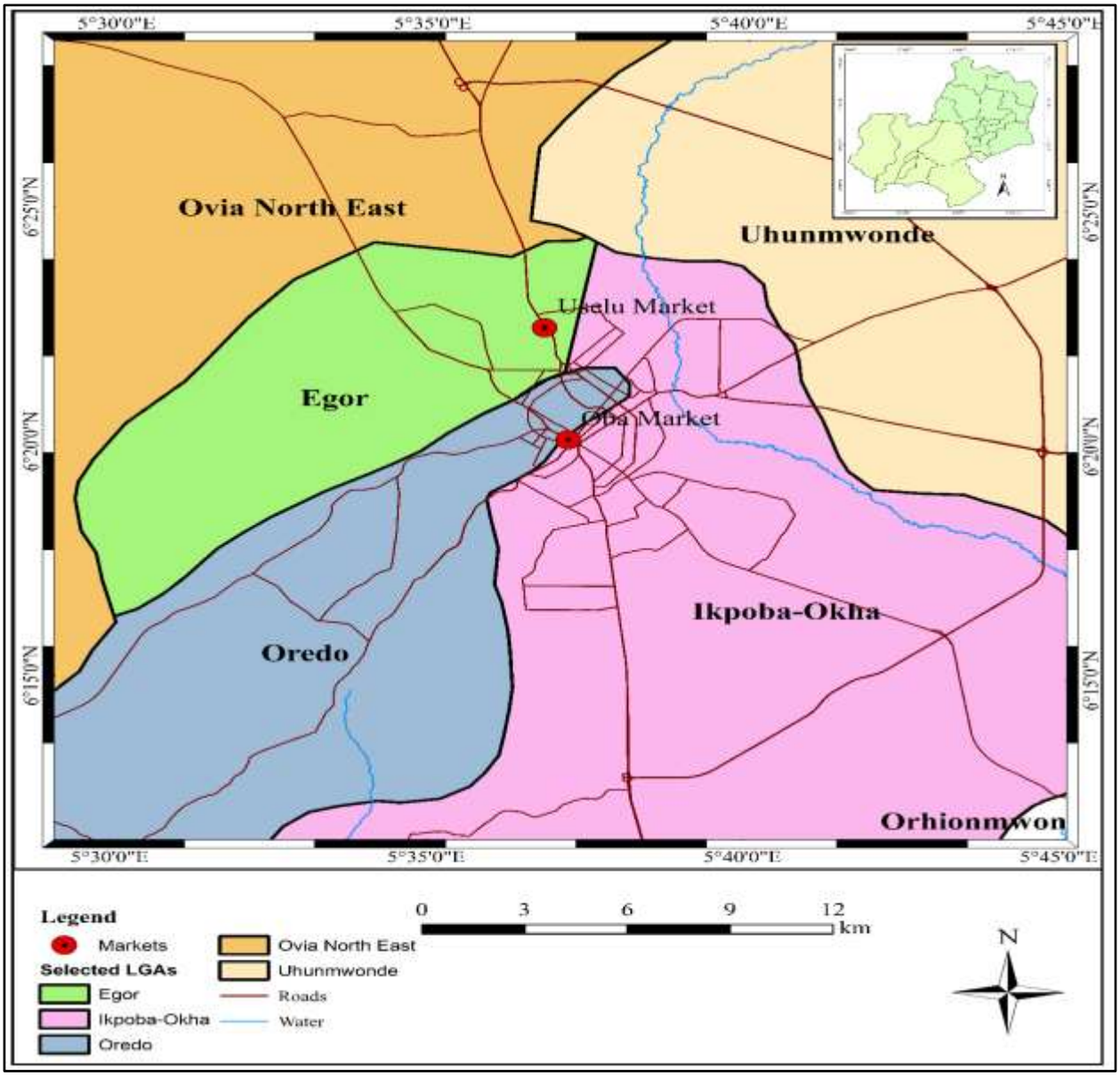

Figure 2: *Benin City Showing Oba and Uselu Markets.*

Source: GRID3, 2021; OpenstreetMap, 2025 and Edited by Authors', 2025.

METHODOLOGY

The study adopted a cross-sectional survey design combined with descriptive market observation. This approach was appropriate because the objective was to capture traders' experiences before and after the removal of fuel subsidy in May 2023. The design enabled the study to compare changes in transportation costs, commodity prices, trader profits, and livelihood conditions within the urban market system of Benin Metropolis.

The research relied on quantitative data obtained from structured questionnaires administered to market traders. The questionnaire collected information on traders' socio-economic characteristics, types of commodities traded, transportation costs, monthly profit levels, and perceived livelihood changes following subsidy removal. In addition, field observations were conducted within the markets to understand price dynamics, commodity movement, and trading patterns.

Both primary and secondary data were used in the study. Primary data were obtained through questionnaires administered to traders operating in selected markets within Benin Metropolis. The questionnaire captured information on transportation costs of staple commodities before and after the removal of fuel subsidy, traders' profit levels, customer patronage patterns, and household livelihood conditions. Secondary data were obtained from published literature, government reports, policy documents, and previous studies related to fuel subsidy reform, market price transmission, and urban livelihoods in Nigeria. These sources provided contextual information that supported the interpretation of the empirical findings.

The study population consisted of traders operating in two major markets within Benin Metropolis: Oba Market in the Oredo Local Government Area and Uselu (Edaiken) Market in the Egor Local Government Area. These markets were selected because they serve as major distribution centres for agricultural produce and staple foods within the city. Market association records and stall owner registers indicated that Oba Market contained approximately 5,054 traders, while Uselu Market contained about 2,070 traders. The combined population of traders in the two markets was therefore estimated at 7,124.

The study applied the Krejcie and Morgan (1970) sampling framework to determine the appropriate sample size for the population. For a population of 7,124 respondents, the recommended sample size is 364. However, a total of 366 respondents were ultimately surveyed across the two markets. This marginal increase was intentional and reflects a common practice in field-based research to account for potential non-response, incomplete questionnaires, or data entry errors (Uma & Roger, 2016). Given the realities of market surveys, where respondent withdrawal or invalid responses may occur, slightly oversampling helps to preserve the minimum required sample size for statistical validity. The addition of two extra respondents does not distort the representativeness of the sample but rather strengthens the reliability of the dataset by ensuring that usable responses meet or exceed the recommended threshold.

Consequently, 366 questionnaires were administered to traders across the two markets. To ensure proportional representation, the sample was allocated based on the relative population size of each market (Edohen & Egharevba, 2024; Egharevba & Atewe 2024). Oba Market accounted for 70.9%

of the trader population, while Uselu Market accounted for 29.1%. Applying these proportions yielded 260 respondents from Oba Market and 106 from Uselu Market.

Informed consent was sought from all respondents before participation, with full disclosure of the study purpose, voluntary nature of involvement, and assurance of confidentiality. Respondents were also informed of their right to withdraw at any stage without any consequence. To ensure instrument validity, the questionnaire was subjected to expert review to confirm content relevance and clarity in relation to the study objectives. This was complemented by a pilot test to assess reliability and refine ambiguous items before full deployment in the field.

A proportionate sampling technique was adopted to distribute the questionnaires across the two markets. Within each market, systematic sampling was used to select respondents from occupied stalls. One trader was selected from each identified stall to ensure that responses represented a wide range of commodity traders. This approach ensured that traders dealing in different staple foods such as rice, beans, yam, garri, vegetables, and palm oil were adequately represented in the sample.

The study examined three major variables. Transportation cost changes, trader profit levels, and livelihood conditions. Transportation costs were measured based on traders' reported expenditure on transporting staple commodities from supply sources to the market before and after the removal of fuel subsidy in May 2023. Respondents were asked to estimate average transportation costs per supply trip for major commodities traded. Trader profit was measured using respondents' reported average monthly profit before and after subsidy removal. Profit change was calculated as the difference between post-subsidy and pre-subsidy profit levels. The livelihood condition was proxied using monthly household income. The intensity of subsidy-related economic pressure was measured by standardising two variables: the effect of subsidy removal on the cost of transporting commodities and the effect on the cost of commodities. These were selected because they represent the two main transmission channels (indirect and direct) of fuel subsidy shocks in market systems, namely logistics costs and direct commodity price adjustments (Mishkin, 2007; World Bank, 2025). Following the OECD (2008) guidelines for constructing composite indicators, Z-score transformation was applied to ensure comparability across variables measured on different scales and to equalize their statistical variance. The standardised values were then summed (Streiner & Norman, 2003), since both variables reflect complementary, compensatory dimensions of a single underlying construct and are expressed on a common metric. This produced the Sum of Z-Score Fuel Subsidy Differences, which served as the index of subsidy-related economic impact experienced by traders Fuel subsidy removal impact was captured through traders' self-reported changes in operational costs and income levels, while household income reflects average monthly earnings from trading activities. These operational definitions ensured consistency in measurement across respondents and allowed for meaningful statistical comparison.

The combination of descriptive statistics, paired sample t-tests, correlation analysis, and regression techniques was selected to provide a comprehensive assessment of both differences and relationships among key variables. Descriptive statistics summarised the magnitude of observed changes, while inferential techniques enabled the testing of statistically significant differences and associations. This multi-method approach strengthens the reliability of the findings by allowing

results to be examined from complementary analytical perspectives rather than relying on a single technique.

RESULT AND DISCUSSION

Examining the Impact of Fuel Subsidy Removal on Staple Foods Prices

The removal of fuel subsidy in Nigeria has triggered wide-ranging economic consequences, with staple foods prices reflecting the most immediate and visible impact. Fuel is central to production, transportation, and distribution, so any change in its cost quickly passes through to goods and services. In Benin Metropolis, where markets rely heavily on road transport and informal trade, the effect is even more pronounced. The surge in transport fares and input costs following the 2023 subsidy removal translated into sharp price increases for staple commodities such as rice, garri, beans, and maize. For households, this meant higher living costs and shrinking purchasing power, while for traders, it reshaped market dynamics and consumer behaviour. Examining how subsidy removal affects staple foods prices is therefore crucial, as it not only reveals the inflationary pressures on urban markets but also highlights the vulnerability of households that spend most of their income on food. See Table 1 for the rate of change in the cost of transporting commodities to the markets.

Table 1: Rate of Change in the Cost of Transportation of Commodities Post-Subsidy Removal

Type of Staple foods	*Pre-Subsidy Cost of Transportation*	*Post-Subsidy Removal Cost of Transportation*	*Difference in Cost of Transportation*	*Percentage Increase in Cost of Transportation*
Rice	₦61866.67	₦78000.00	₦16133.33	20.68
Beans	₦92291.67	₦117166.67	₦24875.00	21.23
Garri	₦70250.00	₦93392.86	₦23142.86	24.78
Yam	₦110233.33	₦152366.67	₦42133.33	27.65
Onion	₦102391.30	₦149808.70	₦47417.39	31.65
Potatoes	₦124400.00	₦182000.00	₦57600.00	31.65
Tomatoes	₦66027.27	₦109174.24	₦43146.97	39.52
Banga	₦7610.81	₦16391.89	₦8781.08	53.57
Vegetable	₦3361.67	₦7565.00	₦4203.33	55.56
Palm Oil	₦2743.24	₦6913.51	₦4170.27	60.32
Fruit	₦8468.75	₦21968.75	₦13500.00	61.45
Plantain	₦2758.00	₦14210.00	₦11452.00	80.59

Source: Author's Computation, 2025.

Table 1 showed clear and consistent increases in transport costs for all commodities after subsidy removal. This result was unsurprising. Fuel price hikes raised haulage and handling expenses.

Those higher costs then fed into transport charges and were passed along supply chains (Onifade et al., 2023). Markets that relied on long road trips and many middlemen were hit hardest, which matched findings from local Nigerian studies (Obasi, 2024). This pattern directly illustrates the Price Pass-Through Theory, which explains how increases in input costs are transmitted through distribution channels until they reach final consumers.

Perishable and high-handling items tended to record the largest rises. Perishables required faster, more careful movement and often refrigerated storage or quicker turnover. When fuel costs rose, traders faced both higher transport bills and greater risk of spoilage, so they raised charges to cover loss and time (Sennuga et al., 2024). The same logic explained why low-weight, high-value items also showed sharp increases: the relative transport cost per unit increased, and traders sought to preserve margins (Burstein & Gopinath, 2014). These dynamics aligned with the theoretical expectation that the degree of pass-through varies by staple foods' characteristics and market demand elasticity.

The observed increase in transportation costs across all commodity groups confirms the central role of fuel as a binding constraint within urban food distribution systems. However, the significance of this result extends beyond simple cost escalation. It reveals the structural dependence of informal market systems on road-based logistics and fragmented supply chains.This pattern is consistent with findings by Obasi (2024) and Onifade et al. (2023), who reported that fuel cost increases were strongly transmitted to transportation and distribution expenses in Nigerian markets. It also aligns with Burstein and Gopinath (2014), who argued that input cost shocks are rapidly transmitted in systems where logistics depend heavily on a single dominant input such as fuel. However, unlike the uniform transmission expected in these studies, the variation observed across commodity groups suggests that pass-through is mediated by commodity-specific characteristics and logistical constraints. This suggests a more differentiated transmission process than commonly assumed.

What becomes evident is not merely that costs increased, but that the magnitude and variation of these increases were shaped by commodity characteristics and handling requirements. Perishable goods recorded higher increases because they depend on speed, frequency, and reduced storage time. This introduces an additional layer of vulnerability, where both cost and risk are transferred along the supply chain.

This finding reinforces the assumptions of the Price Pass-Through Theory but also begins to expose its limitations in real market settings. While the theory predicts transmission of cost increases, it does not fully account for the uneven burden created by infrastructure constraints and commodity-specific logistics. In this case, the pattern suggests that structural inefficiencies amplify cost shocks before they even reach pricing decisions. At a broader level, this indicates that transport cost inflation in informal economies is not neutral. It selectively affects commodities and actors differently, thereby shaping market outcomes in ways that extend beyond simple price adjustments.

Price Pass-Through: Relationship Between Transport Cost and Commodity Prices

The removal of fuel subsidy increased fuel prices and raised the cost of transporting goods across Nigeria. Since transportation is a major component of commodity distribution, changes in haulage

costs often influence the prices at which goods are sold in urban markets. The concept of price pass-through explains this transmission process, where increases in input costs, such as fuel or transportation, are transferred along the supply chain until they affect final commodity prices.

In market systems that depend heavily on road transportation, this relationship can be particularly pronounced. Traders must move agricultural produce from rural production areas to urban consumption centres, and any rise in transport cost may alter selling prices in order to maintain profit margins. Examining the statistical relationship between transportation cost changes and commodity price changes, therefore, provides empirical insight into whether the fuel subsidy shock translated into higher market prices through the pass-through mechanism.

To assess this relationship, a simple linear regression analysis was conducted to determine whether changes in the cost of transporting commodities significantly predicted changes in the cost of commodities sold in the market. The model assumes a direct cost transmission mechanism consistent with the Price Pass-Through Theory. This analysis helps clarify whether transportation costs functioned as a key transmission channel through which the economic effects of fuel subsidy removal were reflected in commodity prices.

Table 2: Simple Linear Regression Analysis of the Effect of Transportation Cost Change on Commodity Price Change

Predictor	B	SE B	β	t	p
Constant	1563.67	601.42	—	2.60	.010
Transport Cost Change	0.003	0.010	.014	0.26	.795
Model Summary:R = .014, R^2 = .000, Adjusted R^2 = −.003, F(1, 364) = 0.07, p = .795, SE = 10,783.09.					

Source: Authors' Computation, 2025.

The regression model tested whether changes in transportation costs influenced changes in commodity prices following fuel subsidy removal. The model explained virtually none of the variation in commodity price changes (R^2 = .000), and the relationship was not statistically significant, F(1, 364) = 0.07, p = .795. The coefficient for transportation cost change was positive but negligible (β = .014), indicating no meaningful predictive effect on commodity prices within the sampled markets.

This finding diverges from established empirical expectations in the literature. Studies such as Onifade et al. (2023) and Raifu and Oshota (2023) report strong transmission from fuel price increases to transport costs and then to food prices in Nigeria. Similarly, Burstein and Gopinath (2014) argue that cost shocks typically propagate through supply chains until reflected in final consumer prices. The absence of a significant relationship in this study, therefore, requires a structural rather than statistical interpretation.

One plausible explanation lies in market adjustment behaviour within informal trading systems. The Price Pass-Through Theory assumes full or partial transmission of input costs into final prices,

yet this mechanism depends on market conditions. In this context, traders appear to have absorbed part of the cost shock rather than passing it on fully. Evidence supports this pattern, as traders experienced margin compression and limited ability to adjust prices due to weak consumer purchasing power and intense competition (Shipurut, Onyedikachi & Abubakar, 2024; Oyasipe & Olukoya, 2024). Paciello et al. (2019) similarly show that firms in competitive markets often restrain price increases to retain customers, resulting in incomplete pass-through.

The result, therefore, suggests that informal markets in Benin Metropolis may function as shock absorbers rather than direct transmission channels. Price stability in this case does not indicate the absence of pressure but reflects internal redistribution of costs. Instead of being passed to consumers, the burden appears to have been absorbed by traders through reduced margins and declining profitability.

Assessing the Impact of Fuel Subsidy Removal on the Profits of Traders

The removal of fuel subsidy in Nigeria has significantly reshaped economic activities, particularly in sectors that rely on transport and energy inputs. Traders are at the forefront of these changes because their profits depend directly on the costs of moving, storing, and selling commodities. With fuel prices rising sharply after subsidy removal, input costs escalated, and operating margins tightened. Many traders absorbed part of the increase to retain customers, while farmers faced higher costs for transporting produce to markets. The result was shrinking profits, growing indebtedness, and in some cases, reduced participation in trading activities. Understanding how subsidy removal has affected profit levels is vital for evaluating its broader impact on livelihoods and for informing targeted policy interventions that can protect vulnerable groups in cities such as Benin Metropolis. See Tables 2 and 3 for the summary statistics and paired t-test result, respectively.

Table 3: Summary Statistics of Profit Before and After Fuel Subsidy Removal

Variable	Mean (₦)	Std. Dev. (₦)	Minimum (₦)	Maximum (₦)
Before Subsidy	200,242.33	28,460.48	102,761.98	315,581.94
After Subsidy	159,751.38	24,038.58	77,124.90	249,008.35
Profit Change	-40,490.95	12,205.43	-82,900.93	-8,945.41

Source, Authors' Computation, 2025.

Table 3 showed the summary statistics, and the data (n = 364) indicated that the average profit before subsidy removal was about ₦200,242, while the average profit after subsidy removal was about ₦159,751. This represents an average decline of roughly ₦40,491 per trader. These outcomes highlight the functioning of urban market systems as both economic and social infrastructures. Rising fuel costs disrupt market linkages, alter patronage patterns, and strain traders' ability to transmit or absorb shocks. As urban facilities, markets mediate between producers, transport operators, and consumers, making them key spaces where subsidy reforms manifest most visibly in everyday urban life

Table 4: Paired T-Test Results

Statistic	Result
t-value	63.29
p-value	0.001

Source: Authors' Computation, 2025.

The paired sample t-test confirmed that the difference was highly significant, with $t(363) = 63.29$, $p < 0.001$. This means the drop in profit was not due to chance but reflected a real and substantial impact of subsidy removal on traders and farmers. The spread of the data also highlighted that, while some respondents experienced smaller losses, nearly all reported declines, underscoring the broad impact of higher transport and input costs. This finding is consistent with previous empirical studies. Shipurut et al. (2024) documented significant reductions in trader income and customer patronage following subsidy removal, while Njoku and Mmougbuo (2025) found that increased operating costs led to declining profitability among small-scale businesses in Nigeria. While these studies emphasised cost-driven profit decline, the present study extends this understanding by demonstrating that such declines occur even in the absence of strong price transmission, highlighting the role of internal cost absorption.

The significant decline in trader profit provides empirical confirmation of the adjustment mechanism identified in the regression analysis. When viewed together, the results indicate that increased transportation costs did not translate into proportional price increases but instead resulted in compressed profit margins.

This outcome reflects a constrained pricing environment in which traders are unable to fully pass rising costs on to consumers. Rather than functioning as price setters, traders operate within narrow margins dictated by demand sensitivity and competition. This limits their ability to respond to external shocks through pricing strategies.

From a theoretical standpoint, this represents a case of incomplete price pass-through, where market actors internalise cost increases. While the Price Pass-Through Theory accommodates partial transmission, the extent observed here suggests a stronger role for behavioural and structural constraints than typically emphasised.

The implication is that informal market systems maintain short-term price stability at the expense of trader welfare. This shifts the focus of policy concern away from consumer prices alone toward the sustainability of livelihoods within the distribution chain.

Investigating the Effects of Fuel Subsidy Removal on the Livelihoods of Traders

The removal of fuel subsidies has had far-reaching consequences that extend beyond staple food prices and traders' profits. For many traders, livelihood security is tied to stable costs of production,

affordable transport, and reliable consumer demand. When fuel prices spiked, these foundations were disrupted, leaving households struggling to cope. Existing studies show that such shocks often force individuals to adopt difficult coping strategies, including reducing food intake, withdrawing children from school, or selling assets to survive (Bakare et al., 2024; Sadiq et al., 2024). In Benin Metropolis, where farming and trading form the backbone of household economies, the effects are particularly pronounced. This section, therefore, examines how subsidy removal reshaped livelihoods, highlighting not just economic losses but also the social and emotional adjustments families were compelled to make.

Correlation statistical analysis was used to test hypothesis two, which states that "there is no relationship between removal of fuel subsidy and the livelihood of the traders". This hypothesis was designed to determine the effect of subsidy removal on traders who have been able to secure their basic needs (food &water, shelter, clothing, healthcare, transportation, sanitation, and education). Monthly income was used as the proxy for livelihood, while the sum of the Z-score difference was used as the proxy for subsidy removal. Table 4.12 shows the correlation table between the two variables.

Table 5: Correlations Table

		Monthly Income	The sum of Z-score Fuel Subsidy Differences
Monthly Income	Pearson Correlation	1	.332**
	Sig. (2-tailed)		.000
	N	366	366
The sum of Z-score Fuel Subsidy Differences	Pearson Correlation	.332**	1
	Sig. (2-tailed)	.000	
	N	366	366
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author's Computation, 2025.

Rule of thumb of Correlation: 0-0.3 (-0.3 to 0) is a weak positive/negative relationship. 0.31-0.7 (-0.7 to -0.31) is a moderate positive/negative relationship. 0.71-1 (-1 to -0.71) means a strong positive/negative relationship.

Table 5 showed a moderate positive correlation between monthly income and the sum of Z-score fuel subsidy differences, with a Pearson correlation coefficient of .332 at the 0.01 significance level. This indicates that higher-income traders recorded higher levels of measured subsidy-related economic pressure. At first glance, this appears counterintuitive, as income is often associated with greater resilience to shocks. However, the result is better understood in terms of scale effects within trading operations.

Higher-income traders typically operate at larger volumes, handle greater stock levels, and engage in more extensive transport and distribution activities. As a result, fuel-related cost increases translate into larger absolute monetary burdens for this group, even if their relative vulnerability may be lower. The correlation, therefore, reflects exposure intensity rather than welfare deterioration alone.

This interpretation suggests that subsidy removal does not affect traders uniformly but scales with the size of economic activity. Larger operators absorb higher absolute cost shocks through logistics and commodity movements, while smaller traders experience lower absolute exposure but potentially greater fragility in sustaining operations. The findings, therefore, highlight structural differences in how economic shocks propagate through heterogeneous market actors rather than a simple income–burden relationship.

This finding aligns with studies such as Bakare et al. (2024) and Sadiq et al. (2024), which show that economic shocks associated with subsidy reforms significantly affect household income and livelihood stability. It also supports the broader evidence presented by the World Bank (2015), which highlighted how rising costs reduce real income and increase vulnerability among low-income households. Furthermore, Njoku and Mmougbuo (2025) emphasised that households often respond to such pressures through coping strategies such as borrowing and consumption adjustment, which is consistent with the patterns observed in this study.

Within the Sustainable Livelihoods Framework, this reflects the erosion of financial capital and the subsequent reliance on alternative forms of capital, such as social networks and informal credit systems. However, these coping mechanisms are not sustainable in the long term, particularly when shocks are prolonged. This suggests that the impact of subsidy removal operates through a dual pathway: direct cost increases within markets and indirect pressure on household resilience. The interaction between these pathways deepens vulnerability, especially among traders with limited asset buffers.

Importantly, this extends the relevance of the findings beyond the immediate study area. Similar dynamics are likely to occur in other urban informal economies where livelihoods depend on small-scale trade and where institutional support systems are weak.

While the study is based in Benin Metropolis, the observed pattern of incomplete price pass-through and livelihood pressure is consistent with findings from other developing economy contexts. Studies such as Dartanto (2013) and Coady et al. (2010) have demonstrated that subsidy reforms often produce uneven transmission effects, with market actors absorbing part of the shock depending on institutional and structural conditions.

The findings of this study suggest that informal markets may function as shock-absorbing systems in which cost increases are not fully transmitted to consumers but are instead internalised by traders. This has implications beyond the study area, particularly for urban economies in developing countries with similar market structures. In such settings, policies that increase input costs without strengthening market capacity may not yield the expected price outcomes but may instead erode

traders' livelihoods. This highlights the need to reconsider assumptions about automatic price transmission in informal economic systems.

Policy Implications

The findings show that fuel subsidy removal significantly increased transport costs, staple food prices, and reduced traders' profits and household incomes. Although intended to improve fiscal stability, the reform intensified livelihood pressures by accelerating cost transmission across supply chains and compressing trader margins, highlighting the need for coordinated policy responses.

First, targeted social protection through cash transfers for traders, farmers, and transport operators is essential to reduce short-term hardship and discourage negative coping strategies such as asset sales and reduced consumption. Second, supply chain costs should be reduced through subsidised agricultural inputs and transport, alongside investment in rural roads, storage, and logistics infrastructure to limit post-harvest losses and price escalation. Third, improved access to affordable credit through microfinance institutions and cooperatives would support business continuity during income shocks. Fourth, future reforms should adopt a phased approach with clear communication and visible reinvestment of savings to ease adjustment. Finally, strengthening community safety nets and investing in alternative energy such as CNG and solar systems would enhance long-term resilience. Taken together, reform must combine short-term protection with structural investments that stabilise markets and safeguard livelihoods.

Conclusion

The study examined the effects of fuel subsidy removal on transportation costs, commodity prices, trader profitability, and livelihoods in selected markets in Benin Metropolis. Findings show that although transportation costs increased significantly, pass-through to commodity prices was weak, while trader profits declined sharply. This indicates that cost shocks were partly absorbed within the trading layer rather than fully transmitted to consumers.

The results reflect how informal markets operate under competitive pressure and limited purchasing power. Traders often adjust by compressing margins rather than raising prices, leading to uneven distribution of policy shocks. This pattern suggests that small-scale market actors bear a disproportionate share of adjustment costs.

The study is limited by its cross-sectional design, which restricts causal inference over time. It also relies on self-reported data, which may introduce response bias. In addition, the focus on selected markets in Benin Metropolis limits generalisability to other regions.

Taken together, subsidy reform reshapes market behaviour and livelihoods beyond price changes, highlighting the need for targeted support in informal economies.

REFERENCES

Adepoju, A. O., & Oni, O. A. (2020). Livelihood diversification and welfare of rural households in Nigeria. *Journal of Development Studies, 56*(9), 1685–1702. https://doi.org/10.1080/00220388.2019.1677884

Sambo, U., & Sule, B. (2024). *Killing the economy*. In *Deradicalisation and post-conflict peacebuilding in Northeast Nigeria: Countering Boko Haram's extremism*. https://doi.org/10.4324/9781003349204-10

Adebogun, O. B., Olatunji, O. J., Agboola, O. A. A., & Edeh, A. (2024). Subsidy Removal, Corrupt Practices and Implications on the Nigerian Economy, 2012-2023. *African Journal of Stability and Development (AJSD)*, *16*(2), 214–232. https://doi.org/10.53982/ajsd.2024.1602.01-j

Kim, E., & Samudro, Y. N. (2021). Reducing Fuel Subsidies and Financing Road Infrastructure in Indonesia: A Financial Computable General Equilibrium Model. *Bulletin of Indonesian Economic Studies*, *57*(1), 111–133. https://doi.org/10.1080/00074918.2019.1643824

Ozuzu, C., & Jafaar, A. (2025). *From policy to practice: A commentary on Nigeria's presidential compressed natural gas initiative*. AO2LAW. https://ao2law.com/from-policy-to-practice-a-commentary-on-nigerias-presidential-compressed-natural-gas-initiative/

Society of Petroleum Engineers. (2024). *Compressed natural gas adoption in Nigeria: Challenges and infrastructure constraints*. In *Proceedings of the SPE Nigeria Annual International Conference and Exhibition (NAIC)*. OnePetro. https://doi.org/10.2118/548482-MS

Uma, S. U., & Roger, B. (2016). *Research methods for business: A skill-building approach* (7th ed.). Wiley. https://www.wiley.com/en-us/Research+Methods+For+Business%3A+A+Skill+Building+Approach%2C+7th+Edition-p-9781119266846

OECD. (2008). *Handbook on constructing composite indicators: Methodology and user guide*. OECD Publishing. https://doi.org/10.1787/9789264043466-en

Streiner, D. L., & Norman, G. R. (2003). *Health measurement scales: A practical guide to their development and use* (3rd ed.). Oxford University Press. https://www.scirp.org/reference/referencespapers?referenceid=573484

Mishkin, F. S. (2007). Inflation dynamics. *International Finance*, *10*(3), 317–334. https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1468-2362.2007.00205.x

World Bank. 2025. Global Landscape of Fuel Subsidies and Price Controls. © World Bank. http://hdl.handle.net/10986/43266

Afrobarometer. (2023). *AD958: Nigerians say country is headed in wrong direction, oppose fuel-subsidy removal*. Afrobarometer Dispatch No. 958.

Akingbade, A. (2023). *Nigeria: How fuel subsidy removal presents transformative opportunity for Nigeria's oil sector*. PwC Nigeria Report.

Ani, D. P., Onoja, E. A., & Humbe, I. T. (2021). Partial fuel subsidy removal in Nigeria: Its effects on the economy and agricultural sector. *International Journal of Social Ecology and Sustainable Development,* 12(1), 98-114.

AP News. (2024, October). Nigeria turns to natural gas as transport prices soar after petrol subsidies were removed. *Associated Press*.

Arndt, C., Benfica, R., & Thurlow, J. (2008). *Higher fuel and food prices: Impacts and responses for Mozambique*. Agricultural Economics, 39, 497–511.

Arze del Granado, F. J., Coady, D., & Gillingham, R. (2012). The unequal benefits of fuel subsidies: A review of evidence for developing countries. *World Development*, 40(11), 2234-2248.

Bakare, D., et al. (2024). Early impacts of fuel subsidy removal on mental health outcomes in Nigeria. *Nigerian Journal of Public Health, 12*(3), 210–223.

Balogun, E. D. (2025). *The short-term effects of gasoline price subsidy removal in Nigeria* (MPRA Paper). Munich Personal RePEc Archive.

Burstein, A., & Gopinath, G. (2014). International prices and exchange rates. In G. Gopinath, E. Helpman, & K. Rogoff (Eds.), *Handbook of International Economics* (Vol. 4, pp. 391–451). Elsevier.

Paciello, L., Pozzi, A., & Trachter, N. (2019). Price Dynamics with Customer Markets. *International Economic Review*, *60*(1), 413–446. http://www.jstor.org/stable/45117649

Chambers, R., & Conway, G. R. (1992). *Sustainable rural livelihoods: Practical concepts for the 21st century* (IDS Discussion Paper 296). Institute of Development Studies.

Chepeliev, M. (2020). *Impacts of fuel subsidy reform on household welfare: A global CGE analysis*. Energy Economics, 86, 104694. https://doi.org/10.1016/j.eneco.2019.104694

Chirwa, E., & Dorward, A. (2013). *Agricultural input subsidies: The recent Malawi experience*. Oxford University Press.

Coady, D., El-Said, M., Gillingham, R., Kpodar, K., Medas, P., & Newhouse, D. (2010). *The magnitude and distribution of fuel subsidies: Evidence from Bolivia, Ghana, Jordan, Mali, and Sri Lanka*. IMF Working Paper, WP/10/93.

Coady, D., Parry, I., Sears, L., & Shang, B. (2015). How large are global energy subsidies? *World Development, 91,* 11–27. https://doi.org/10.1016/j.worlddev.2016.10.004

Dartanto, T. (2013). *Reducing fuel subsidies and the implication on fiscal balance and poverty in Indonesia: A simulation analysis*. Energy Policy, 58, 117–134. https://doi.org/10.1016/j.enpol.2013.02.040

Department for International Development (DFID). (1999). *Sustainable livelihoods guidance sheets*. DFID.

Edohen, P. O. and Egharevba J. O. (2024). Off-farm employment: A Panacea for increased agricultural productivity of farm owners in Gwer West Local Government Area, Benue State, Nigeria. *Journal of the Geographical Association of Tanzania*. 44(2) 34-52. http://doi.org/10.56279/jgat.v44i2.304

Egharevba, J. O. and Edohen, P. O. (2025). Exploring the economic and environmental influence of street trading in Benin Metropolis: A relational analysis. *Journal of Acdemic Research in Economics* 17(1) 64-78, Spiru Haret University, Faculty of Law and Economics, Romania.

Egharevba, J. O. and Otabor-Olubor, E. (2023). Assessment of awareness and perception of sexual violence in Benin Metropolis: A gender and locational perspective. *International Journal of Social Sciences (UNIUYO).* 15(1): 40-53

Egharevba, J. O. and Atewe, A. F. (2024). Insecurity and the coping strategies of residents in Benin Metropolis, Nigeria. *Ghana Journal of Geography*, 16(3) 108-119. DOI: 10.4314/gjg.v16i3.11. https://www.ajol.info/index.php/gjg/article/view/280823

Ekine, D. I., & Okidim, I. A. (2013). Price transmission and market integration analysis of selected food commodities in Nigeria. *International Journal of Agricultural Economics and Rural Development, 6*(1), 1–11.

Ezuem, M. D. (2024). Effect of fuel subsidy removal on Nigeria's standard and cost of living: A case study of Taraba State. *IIARD Journals.*

Goldberg, P. K., & Knetter, M. M. (1997). Goods prices and exchange rates: What have we learned? *Journal of Economic Literature, 35*(3), 1243–1272.

Idoko, O. (2023). Neoliberal policies and poverty: An examination of the impact of fuel subsidies removal on women in Nigeria. *Journal of Arts, Humanities and Social Science.*

IMF. (2013). *Jordan: Energy subsidy reforms and household compensation*. IMF Country Report.

IMF. (2014). *Yemen: Selected issues paper*. IMF Country Report No. 14/276.

Krugman, P. R., & Obstfeld, M. (1991). *International economics: Theory and policy*. HarperCollins.

Maih, A., Omotosho, O., & Yang, L. (2024). Immediate inflationary impacts of Nigeria's subsidy removal: Evidence from market surveys. *Journal of African Economic Studies, 12*(2), 45–62.

McCulloch, N., Moerenhout, T., & Yang, J. (2021). Fuel subsidy reform and the social contract in Nigeria: A micro-economic analysis. *Energy policy*, *156*, None. https://doi.org/10.1016/j.enpol.2021.112336Akinteye, J. O. (2025). *Exploring the effects of fuel subsidy removal on national development: The Nigerian situation*. *Journal of Human Resources and Management Science, 8*(7). https://doi.org/10.70382/hujhrms.v8i7.021

Morse, S. (2025). Sustainable livelihoods in urban Africa: Conceptual approaches. *Journal of Development Studies, 61*(4), 345–360.

Njoku, B., & Mmougbuo, M. (2025). Assessing fuel subsidy removal: Implications for Nigerian households and small businesses. *African Journal of Social Sciences, 59*(1), 45–60. https://cdn.b12.io/client_media/6Rw1vQxq/5ea9d114-1e7f-11f0-8ce3-0242ac110002-AJSS_59_NJOKU_ASSESSING_FUEL_SUBSIDY_REMOVAL.pdf

Nomsoor, A. A. (2025). The socioeconomic impacts of fuel subsidy removal and coping strategies in Lafia LGA, Nasarawa State. *IIARD Journals*.

Obasi, C. D. (2024). An assessment of the effects of fuel subsidy removal on food prices and supply chains in Abia State. *IIARD Journals*.

Olayemi, A. O. (2012). Livelihood strategies of rural households in Nigeria: Implications for poverty reduction. *Journal of Sustainable Development in Africa, 14*(5), 110–126.

Olayungbo, D. O. (2021). Crude oil prices pass-through to retail petroleum product prices in Nigeria. *PLoS ONE / PMC.*

Oluwaseun, O., & Arun, T. G. (2024). Nigeria's fossil fuel subsidy reforms: The welfare effects on households. *ODI Report*.

Onifade, S. T., Ogunleye, O. O., & Adeola, A. (2023). Fuel subsidy removal and welfare in Nigeria: Evidence from a computable general equilibrium model. *British Journal of Contemporary Economics, 9*(3), 3604–3615. https://ideas.repec.org/a/bcp/journl/v9y2025issue-3p3604-3615.html

Oyasipe, S. A., & Olukoya, F. I. (2024). The effect of fuel subsidy removal on the profitability of entrepreneurial businesses in Lagos State, Nigeria. FULafia *International Journal of Business and Allied Studies,* 2(1), 107-118.

Ozili, P. K. (2023). *Implications of fuel subsidy removal on the Nigerian economy* (MPRA Paper No. 118798). University Library of Munich, Germany.

Ozili, P. K., & Obiora, K. S. (2024). Implications of fuel subsidy removal on the Nigerian economy. *Journal of Energy Economics and Policy, 14*(2), 101–112. https://www.researchgate.net/publication/372959038_Implications_of_Fuel_Subsidy_Removal_on_the_Nigerian_Economy

Raifu, I. A. (2024). Simulating the inflationary effects of fuel subsidy removal in Nigeria: Evidence from a novel approach. *Econ. Simulation Studies.* erl.scholasticahq.com

Raifu, I. A., & Oshota, S. O. (2023). Re-examining oil price-stock market returns nexus in Nigeria using a two-stage Markov regime switching approach. *International Journal of Energy Sector Management*, 17(3), 489-509.

Real Impact. (2024). *Evaluating Nigeria's palliatives after fuel subsidy removal*. Real Impact (policy blog/report).

Reuters. (2024). Nigeria's NNPC raises fuel prices as it ditches costly subsidies. *Reuters*.

RSIS International. (2024). *Effects of fuel subsidy removal on small-scale manufacturing in Nigeria* (Policy brief). RSIS.

Sadiq, A., Bello, M., & Yusuf, R. (2024). Livelihood vulnerability and resilience capacity: Evidence from Bauchi State. *Journal of Rural Studies, 10*(2), 101–118.

Scoones, I. (1998). Sustainable rural livelihoods: A framework for analysis (IDS Working Paper 72). Institute of Development Studies.

Sdralevich, C., Sab, R., Zouhar, Y., & Albertin, G. (2014). *Subsidy reform in the Middle East and North Africa: Recent progress and challenges ahead*. IMF.

Sennuga, S. O., Isola, E. O., Bamidele, J., Anone, D., & Olaitan, M. A. (2024). Impact of fuel subsidy removal on agricultural production among smallholder farmers in Niger State. *Journal of Agricultural Economics and Development, 11*(2), 88–107.

Shipurut, P., Onyedikachi, E., & Abubakar, H. (2024). Impacts of fuel subsidy removal on trading activities in Takum LGA, Taraba State. *Taraba State Economic Review, 5*(1), 23–39.

Siddig, K., Aguiar, A., Grethe, H., Minor, P., & Walmsley, T. (2015). Impacts of removing fuel import subsidies in Nigeria on poverty. *Energy Policy, 85,* 257–271. https://openknowledge.worldbank.org/entities/publication/286f9fa6-95df-5d47-8b49-225418205844

Supply Chain Case Study. (2025). *Impact of fuel subsidy removal on Nigeria's supply chain: A case study analysis* (Research report). ResearchGate/Independent Research Group.

U.S. Department of Agriculture Foreign Agricultural Service. (2024). *Nigeria: Agriculture sector overview*. USDA FAS GAIN Report.

Verme, P., & El-Massnaoui, K. (2015). *An evaluation of the 2014 subsidy reforms in Morocco and a simulation of further reforms*. World Bank Policy Research Working Paper 7224.

World Bank. (2015). *Nigeria economic report: Subsidy reforms and household welfare* (Report No. 94672). World Bank. https://openknowledge.worldbank.org/handle/10986/28619

Yahuza, D. I., Wakili, N. T., & Aliyu, U. (2023). Policy of fuel subsidy removal in Nigeria: Problems, prospects and ways forward. *International Journal of Research and Innovation in Social Science,* 7(10), 420-429.