

## EFFECT OF FUEL SUBSIDY REMOVAL ON FOOD SECURITY IN NIGERIA

**Oyeniya Olayemi OYETAYO**

Department of Political Science, Obafemi Awolowo University, Ile-Ife

Tel: 07030507101, 08067361584

Email: Extractorenergy@gmail.com

**Suraju Aderemi OGUNMODEDE**

Department of Political Science, University of Ilesa, Osun State Nigeria,

<http://orcid.org/0009-0007-5762-7380>

[suraju\\_ogunmodede@unilesa.edu.ng](mailto:suraju_ogunmodede@unilesa.edu.ng)

Anthony Dotun Oladipo, Ph.D.

Department of Economics, Osun State University, Osogbo, Nigeria.

[anthony.oladipo@uniosun.edu.ng](mailto:anthony.oladipo@uniosun.edu.ng)

**Olagoke Oluwafemi AWOTAYO, Ph.D.**

Department of Political Science, University of Ilesa, Osun State Nigeria,

<http://orcid.org/0000-0001-9768-8910>

[olagoke\\_awotayo@unilesa.edu.ng](mailto:olagoke_awotayo@unilesa.edu.ng)

### Abstract

Use of subsidy on fuel in Nigeria has been a contentious issue for a long time. Successive governments before President Bola Ahmed Tinubu have made frantic effort to remove subsidy on fuel but unsuccessfully. One of the critical decisions President Tinubu made as part of his inaugural messages on 29th May 2023 was to remove subsidy on fuel. However, the removal of subsidy on fuel has brought far-reaching consequences on food security. This study investigated the effect of fuel subsidy removal on food security in Nigeria. The study also assessed the effect of increased transportation costs on food distribution and accessibility across urban and rural areas, and analyzed the influence of fuel subsidy removal on the cost of agricultural produce and food availability. Using a mixed-method approach, the study combined quantitative and qualitative data to explore the multifaceted challenges and propose actionable solutions. The study found that though the removal of subsidy relieves government of fiscal burdens, it exacerbates food insecurity through increased costs of food production and distribution. The study concluded that a balanced and inclusive approach to policy reform is crucial for sustainable food security in Nigeria.

**Keywords:** Fuel Subsidy Removal, Fuel Subsidy, Agricultural Productivity, Sustainable Development, Livelihood Resilience

### Introduction

Nigeria has significant natural resources, one of which is crude oil. Nigeria's oil reserve is approximately 37 billion barrels, making it the second largest in Africa and the tenth largest globally (OPEC, 2023). The country also has 209 trillion standard cubic feet (Tscf) of proven natural gas reserves, ranking as the largest in Africa and the eighth-largest worldwide (Savannah Energy, 2023). Fuel subsidies have long been a central feature of Nigeria's economic policy (McCulloch et al., 2021). Fuel subsidies were introduced in Nigeria during the 1970s as a mechanism to alleviate the economic burden of high energy costs on the populace and support the

industrial and agricultural sectors. The subsidies were aimed at keeping fuel prices artificially low to stimulate economic growth, reduce inflationary pressures, and improve living standards. However, the sustainability of these subsidies has been questioned, as it places burden on government, with the costs considered excessively high and unsustainable. Between 2006 and 2019, fuel subsidies consumed N10.413 trillion, averaging N743.8 billion annually (Onyedinefu, 2020). According to Nuhu-Koko (2008), a considerable portion of public funds has been allocated to subsidy expenditures, amounting to approximately US\$2.03 billion (1.4% of GDP) in 2006, US\$2.3 billion (1.3% of GDP) in 2007, and US\$5.37 billion (1.3% of GDP) in 2010. In addition, government payments to petroleum marketers for subsidies between 2008 and 2010 were estimated at US\$10.7 billion. By 2011, expenditure on petrol subsidies had surpassed N730 billion (Budgit, 2023). In 2022, Nigeria National Petroleum Company Limited (NNPCL) reported that subsidy cost has escalated to N4.39 trillion, and it is projected to reach N6.72 trillion for the entire 2023 fiscal year (Reuters, 2023). To sustain government expenditures, government was compelled to eliminate fuel subsidies. This decision was necessary to curb unsustainable practices that were adversely affecting the economy, with one of the key measures being the deregulation of Premium Motor Spirit (PMS) prices (Oluwabukola, 2023).

The subsidy regime was marred by inefficiencies and corruption, with reports indicating that much of the subsidized fuel never reached its intended beneficiaries. Moreover, the financial burden of subsidies, particularly during periods of low oil prices, has been a major source of fiscal burden, limiting government spending on healthcare, education, and infrastructure. Despite these arguments, the removal of fuel subsidies has become a politically sensitive issue, resulting in public protests, particularly from labour unions and civil society groups. In addition, the removal of subsidies has resulted in rise of fuel prices, and other facets of the economy, especially in the area of agriculture and food production. Given the fact that fuel plays a crucial role in food production, transportation, and storage, this fuel subsidy removal poses serious concerns about food security in Nigeria. Therefore, this paper examined the effects of fuel subsidy removal on food security in Nigeria, exploring how rising fuel costs affect agricultural produce, food prices, and accessibility.

### **Research Questions**

The research questions are as follows:

- i. What are the effects of fuel subsidy removal on food prices and affordability for households in Nigeria?
- ii. How has increased transportation cost, resulting from fuel subsidy removal, affected food distribution and accessibility in urban and rural areas in Nigeria?
- iii. How has fuel subsidy removal affected cost of agricultural produce and food availability in Nigeria?

### **Objectives of the Study**

The objectives of the study are to:

- iv. examine the effects of fuel subsidy removal on food prices and affordability for households in Nigeria.
- v. assess the effect of increased transportation costs on food distribution and accessibility across urban and rural areas in Nigeria.
- vi. discuss the influence of fuel subsidy removal on agricultural produce and food availability.

### **Conceptualizations**

Fuel subsidies are policies aimed at decreasing the costs of energy by providing money, removing taxes to consumers, or setting price for oil products. According to Stober (2016), fuel subsidies refer to provision of monetary aid by government to producers or consumers in the private sector without reciprocation. These subsidies help make energy cheaper in order to promote economic development, as noted by Li, Shi, and Su (2017). Still, the subsidies are viewed as problematic for two reasons: they have an impact on fiscal balances, distorting the market and contributing to financial deterioration, according to Clements et al. (2013).

Fuel subsidies are damaging from an environmental stance; as Monasterolo and Raberto (2019) highlighted that subsidy triggered a problem of too much consumption as it discourages the use of renewable sources of energy. Victor (2009) addresses the politics of subsidies, pointing out that reform is difficult due to pressure from interested stakeholders rather than drastic political changes. Further, evidence reported by Coady et al. (2015) also shows that subsidies are favouring the superior quintile of the population, which poses questions to their efficiency for poverty reduction. Discussing challenges of phasing out subsidies, Schwanitz et al. (2014) note that sub-optimal subsidies are socio-political issues, especially in developing countries where energy accessibility is a major concern.

By analyzing existing definitions of fuel subsidies, it was possible to identify that definitions pay much attention to the financial, environmental, or economic aspects but lack important social aspects like equity or distribution. A broader definition describes fuel subsidies as any type of government intervention whose purpose is the achievement of lower energy prices, though such interventions are associated with various fiscal, environmental, and social difficulties. However, subsidies are detrimental to actual markets and seriously hinder the process of developing sustainable energy systems as they only serve to increase inequality.

The removal of subsidies on fuel is a policy goal that seeks to distance government support for fossil fuel, resulting in cost-reflective fuel prices. It is commonly employed where the goals are to cut costs, increase energy use productivity, and foster environmental conservation. Lin and Li (2012) agreed with the removal of subsidies because subsidies elimination aids in optimising resource use and minimising deficits. They acknowledged that removal of subsidies has cross-impact on different regions and sectors, which needs to be managed with other tackling tools and options. Jewell et al. (2018) examine subsidy removal under the environmental lens, noting that these subsidies undermine consumption reduction necessary to achieve climate goals while slowing the shift to renewable energy. Bazilian and Onyeji (2012) centre their discussion on the socio-economic impact of subsidy removal particularly in the developing world, where challenges arising from weak structures and institutions intensify inequality and hardship after the removal of subsidies. Chatri et al. (2014) present a dual perspective by acknowledging the positive impacts of subsidy eradication in the longer run, such as removal of deficits and encouraging investment in renewable energy, alongside the certain adverse effects through enhanced energy costs which put pressure on consumption.

Food security is a dynamic concept that requires understanding to resolve issues of hunger, health, and sustainable development. Pinstруп-Andersen (2009) defines food security more as the welfare of individuals and households, nutritionally enabled by water and sanitation. Norhasmah et al. (2010) add a framework with four dimensions: accessibility, acceptability, adequacy, and availability, which define the social acceptability of food. The World Food Summit (WFS) definition of 1996 expanded this standard further, providing that food security means that all people have access to sufficient, safe, physically, socially, and economically accessible and

nutritious food that will enable them to lead active healthy lives. However, these comprehensive definitions have been critiqued for paying insufficient attention to environmental sustainability and access to foods due to climate changes.

### **Theorizing Fuel Subsidy Removal and Food Insecurity**

This paper employed the vulnerability theory and systems theory to examine the relationship between fuel subsidy removal and food security in Nigeria.

### **Vulnerability Theory**

The vulnerability theory, propounded by Martha Fineman, is widely used in food security and climate change studies to understand how individuals, communities, and systems are exposed to risks and their capacity to adapt (Kohn, 2014; Zakour and Gillespie, 2012). It emphasizes three key dimensions: exposure, sensitivity, and adaptive capacity.

First, exposure is the extent to which individuals or systems are exposed to external shocks or stresses (Kohn, 2014; Zakour and Gillespie, 2012; Fineman, 2010). The removal of fuel subsidies increases exposure to risks across the agricultural value chain, particularly in areas such as transportation costs, energy-intensive farming practices, and food distribution networks. Smallholder farmers and low-income households are disproportionately exposed due to their reliance on fuel for irrigation, mechanized tools, and transportation to markets. Second, sensitivity is how severely the exposed entity is affected by the shock. Agricultural systems and food supply chains in Southwest Nigeria are highly sensitive to fuel price increases. Rising costs lead to higher food prices, reducing the purchasing power of households and limiting access to nutritious food. Urban and peri-urban areas are particularly sensitive, given their dependence on food transported from rural regions. Lastly, adaptive capacity is the ability to cope, recover, and transform in response to the shock. The framework highlights disparities in adaptive capacity. Wealthier farmers and commercial food producers may adopt renewable energy technologies or invest in cost-saving measures, while smallholder farmers and low-income households often lack the resources or knowledge to do so. This disparity exacerbates inequalities and undermines long-term food security.

While the Vulnerability Framework effectively identifies risk factors and adaptive gaps, it often focuses on immediate responses rather than systemic, long-term solutions. However, its application in this study is enhanced by integrating it with systems theory, which provides a broader perspective on systemic interconnections and sustainable adaptations.

### **Systems Theory**

Systems theory offers a holistic framework for analysing complex systems by examining the interconnections, feedback loops, and dynamic relationships among various components (Hanumanthappa, 2023; Montuori, 2015). The theory is suitable for this paper in that fuel subsidy removal affects multiple interconnected systems: energy, transportation, agriculture, and food distribution. Systems Theory helps to map these interconnections, showing how disruptions in one area (e.g., fuel prices) cascade through the entire food system, affecting production, processing, and accessibility (Hanumanthappa, 2023; Montuori, 2015; Main, 2023). The theory emphasizes feedback loops, both positive and negative. For the positive loop, rising fuel prices increase food costs, reducing demand for non-essential food items, which could harm farmers' incomes, leading to reduced agricultural investment and further limiting food supply. For the negative loop, subsidy removal may incentivize investment in alternative energy solutions, such as solar-powered irrigation systems, which could reduce long-term dependence on fossil fuels and enhance food

system resilience. Systems theory also highlights opportunities for systemic adaptations, such as improving rural road infrastructure to reduce transportation inefficiencies, and investing in decentralized food production systems, such as urban farming, to reduce dependence on long supply chains.

The integration of the vulnerability framework and systems theory provides a robust analytical foundation for this study. Together, they allow for understanding the specific vulnerabilities of smallholder farmers, low-income households, and other marginalized groups; examination of systemic factors contributing to food insecurity, such as energy policies, infrastructure, and market dynamics; and identification of both short-term interventions (e.g., targeted subsidies) and long-term strategies (e.g., investments in renewable energy and decentralized food systems) to enhance food security in Southwest Nigeria. By combining these theoretical perspectives, the study moves beyond a fragmented understanding of the issue, offering a nuanced analysis that accounts for both immediate vulnerabilities and systemic complexities.

### Methodology

This study employed both primary and secondary methods of data collection. Primary data were collected through administration of questionnaires to farmers, traders, transport operators, and policymakers across Nigeria. Secondary data were obtained from government reports, international publications such as the Food and Agriculture Organisation (FAO), World Bank, and peer-reviewed articles. For the primary data, simple percentage was used for analysis, while thematic analysis was used to analyse secondary data by exploring trends and patterns of the study.

### Data Presentation

#### Demographics

Variable	Response	Count
1. Age Group	36–50 years: 50%	164 respondents
	18–35 years: 30%	98 respondents
	Above 50 years: 20%	66 respondents
2. Gender	Male: 60%	197 respondents
	Female: 40%	131 respondents
3. Primary Occupation	Farmers: 40%	131 respondents
	Transport Operators: 30%	98 respondents
	Food Vendors: 20%	66 respondents
	Government Workers/Other: 10%	33 respondents
4. Location	Lagos: 30%	98 respondents
	Oyo: 20%	66 respondents
	Ogun: 15%	49 respondents
	Osun: 15%	49 respondents
	Ekiti: 10%	33 respondents

5. Monthly Income	Ondo: 10%	33 respondents
	Below ₦30,000: 30%	98 respondents
	₦30,000–₦50,000: 50%	164 respondents
	₦51,000–₦100,000: 20%	66 respondents

### Effects of Fuel Subsidy

Question	Response	Count
6. Noticed Increase in Fuel Prices	Yes: 100%	328 respondents
7. Impact on Livelihoods (multiple)	Increased transportation costs: 50%	164 respondents
	Increased cost of agricultural inputs: 30%	98 respondents
	Reduced income: 15%	49 respondents
	Loss of business opportunities: 5%	16 respondents
8. Increased Fuel-Related Expenses	Spending 31–50% more: 50%	164 respondents
	Spending 11–30% more: 30%	98 respondents
	Spending over 50% more: 20%	66 respondents
9. Frequency of Fuel Use	Daily: 70%	230 respondents
	Weekly: 20%	66 respondents
	Rarely: 10%	33 respondents

### Effects on Food Security

Question	Response	Count
10. Impact on Food Prices	Large increase (above 30%): 70%	230 respondents
	Moderate increase (11–30%): 25%	82 respondents
	Slight increase (1–10%): 5%	16 respondents
11. Most Affected Food Items (multiple)	Cassava: 50%	164 respondents
	Rice: 40%	131 respondents
	Vegetables: 40%	131 respondents
	Yam: 30%	98 respondents
	Fish/Meat: 20%	66 respondents

12. Changes in Food Consumption	Reduced quantity consumed: 60%	197 respondents
	Reduced variety consumed: 40%	131 respondents
13. Monthly Income Spent on Food	51–70%: 50%	164 respondents
	Above 70%: 30%	98 respondents
14. Experienced Food Shortages	30–50%: 20%	66 respondents
	Yes: 85%	279 respondents
15. Frequency of Food Shortages	No: 15%	49 respondents
	Occasionally: 60%	197 respondents
	Frequently: 25%	82 respondents
	Rarely: 15%	49 respondents

#### Effects on Agricultural Produce

Question	Response	Count
16. Increased Input Costs	Yes: 90%	295 respondents
	No: 10%	33 respondents
17. Production Cost Increase	Costs increased 31–50%: 40%	131 respondents
	Costs increased 11–30%: 30%	98 respondents
	Costs increased over 50%: 20%	66 respondents
	Costs increased below 10%: 10%	33 respondents
18. Reduced Farm Output	Yes: 75%	246 respondents
	No: 25%	82 respondents
19. Affected Crops	Food crops (cassava, maize): 60%	197 respondents
	Both cash and food crops: 30%	98 respondents
	Cash crops (cocoa, palm oil): 10%	33 respondents

**Policy Options**

Question	Response	Count
20. Support Measures (multiple)	Subsidizing agricultural inputs: 40%	131 respondents
	Improving rural road infrastructure: 30%	98 respondents
	Providing transportation grants: 20%	66 respondents
21. Government Program Effectiveness	Introducing social safety nets: 10%	33 respondents
	Ineffective: 50%	164 respondents
	Somewhat effective: 30%	98 respondents
22. Additional Policy Recommendations	Not aware of any programs: 20%	66 respondents
	Direct cash transfers to low-income households	
	Regulating transportation costs	

**Analysis and Discussion**

This section analyses the results extracted from the data above and highlights key patterns, trends, and observations based on the objectives of the study.

**Objective One: Effects of Fuel Subsidy Removal on Food Prices and Affordability**

The removal of fuel subsidies has led to a significant increase in food prices, as reported by 70% of respondents who noted a large increase (above 30%) in food prices. This aligns with the study of Adenikinju (2005) that fuel subsidies act as a buffer against rising energy costs, and their removal often leads to inflationary pressures on food prices. Similarly, Oyejide and Adewuyi (2011) argued that higher fuel prices increase the cost of logistics, which consumers bear through higher food prices. This has resulted in reduced food affordability, with 60% of respondents reporting a reduction in the quantity of food consumed and 40% noting a reduction in food variety. Monsuru (2024) also found that fuel subsidy removal disproportionately affects low-income households, as they spend a larger proportion of their income on food. In this study, 50% of respondents reported spending 51–70% of their monthly income on food, further exacerbating food insecurity.

**Objective Two: Effects of Increased Transportation Costs on Food Distribution and Accessibility**

From the data above, 100% of respondents noticed an increase in fuel prices, with 50% reporting a 31–50% rise in transportation costs. This has significantly affected food distribution and accessibility, particularly in rural areas. This finding tallies with Jung (2023) who reiterated that transportation costs are critical components of food supply chains, and any increase in fuel prices disrupts the flow of goods from farms to markets. This is evident in the study, where 50% of respondents cited increased transportation costs as a major impact of fuel subsidy removal. The findings affirm the position of Matemilola and Elegbede (2017) that rural areas, which often have

poor road infrastructure, are more vulnerable to transportation cost hikes, leading to food shortages and higher prices. The study showed that 85% of respondents experienced food shortages, particularly in rural states like Oyo, Ogun, and Osun. Furthermore, 70% of respondents reported using fuel daily, indicating the centrality of transportation in their livelihoods and food distribution networks.

### **Objective Three: Influence of Fuel Subsidy Removal on Agricultural Produce and Food Availability**

The removal of fuel subsidies has significantly affected cost of agricultural produce, as reported by 90% of respondents. This finding corroborates Ezekiel (2024), who argued that fuel is a critical input in agriculture, powering machinery, irrigation systems, and transportation of produce. The study found that 40% of respondents experienced a 31–50% increase in production costs, while 20% reported an increase of over 50%. This has led to reduced farm output, with 75% of respondents confirming a decline in agricultural productivity. In the same vein, Oyakhilomen and Zibah (2014) highlighted that higher production costs often force farmers to reduce their scale of operations, leading to lower food availability. In this study, food crops like cassava and rice were the most affected, with 60% of respondents reporting reduced output. This aligns with Ojo and Adebayo (2012), who found that staple crops are particularly vulnerable to input cost increases, because they are grown by smallholder farmers with limited financial resilience.

The removal of fuel subsidies poses challenges for food security in Nigeria. However, efforts could be directed towards renewable energy sources such as solar power to reduce reliance on fuel for agricultural purposes. Solar-powered irrigation systems and other renewable energy technologies can help farmers maintain productivity. This would not only improve agricultural output but also reduce the carbon footprint of farming activities. In addition, building better roads, storage facilities, and transportation networks in rural areas can help reduce the cost of moving food items from farms to markets. Investments in infrastructure will not only make food transportation more efficient but also reduce post-harvest losses, ensuring that more food reaches consumers.

With fuel subsidies phased out, government should provide targeted subsidies in critical areas for essential agricultural inputs such as fertilizers, seeds, and irrigation equipment. This would help farmers offset the high costs of acquiring relevant tools for agricultural production and ensuring that food production remains stable. In addition, it is important that government encourage local food production through the provision of credit, technical support, and training for smallholder farmers. Government should also focus on policies that promote the diversification of crops and farming techniques in the face of fuel price fluctuations. Creation of efficient and affordable public transportation systems for food distribution, especially in urban areas, would help reduce the effect of rising fuel prices and costs. By reducing the reliance on private vehicles for food transportation, public systems can lower overall transportation expenses on supply of food items.

The removal of fuel subsidies in Nigeria has significant consequences for food security. Rising fuel prices increase the cost of agricultural production, transportation, and food processing, leading to higher food prices and reduced access to affordable, nutritious food for many Nigerians. While the removal of subsidy on fuel has yielded some benefits to government, it is important that government adopts investment in renewable energy, improvements in rural infrastructure, and targeted subsidies for agricultural inputs. By doing so, the rising cost of food in production and distribution would be addressed drastically.

### **Recommendations**

1. light of the study's findings, a comprehensive and well-coordinated policy response is required to mitigate the adverse effects of fuel subsidy removal on food security in Nigeria.

2. The government should transition from universal fuel subsidies to targeted agricultural interventions, with priority given to subsidizing critical farm inputs such as fertilizers, improved seeds, irrigation technologies, and mechanization services. This would help sustain agricultural productivity amidst rising energy costs.
3. There is an urgent need for increased investment in rural infrastructure, particularly road networks, storage facilities, and transportation systems. Strengthening these infrastructures would reduce logistics costs, minimize post-harvest losses, and improve market access for agricultural producers.
4. The promotion of renewable energy alternatives, notably solar-powered irrigation and other off-grid solutions, should be intensified. Such initiatives would reduce dependence on fossil fuels and enhance long-term resilience within the agricultural sector.
5. Institutional support for smallholder farmers must also be strengthened through improved access to affordable credit, extension services, and capacity-building programs. Encouraging localized food production systems will help reduce reliance on costly, fuel-dependent distribution networks.
6. Policies should further encourage crop diversification and the adoption of improved agronomic practices. Diversification can serve as a risk management strategy, enabling farmers to better withstand price volatility and production shocks.
7. The expansion of social protection mechanisms is equally essential to cushion vulnerable populations. Measures such as targeted cash transfers, transportation cost regulation, and the development of affordable food distribution channels are necessary to safeguard household food access during periods of economic adjustment.

#### Conclusion

The study shows that while eliminating fuel subsidies may ease fiscal pressures on the Nigerian government, it has notably worsened food insecurity throughout the country. The rise in fuel prices has resulted in increased transportation costs, agricultural inputs, processing, and distribution, driving up the prices of staple food items such as cassava, rice, vegetables, and yam. As a result, households are forced to spend a larger portion of their income on food, often leading to reduced dietary diversity and poorer nutritional intake. The frequency of food shortages has also become more evident, particularly among low-income groups.

Additionally, farmers and food traders are experiencing greater operational challenges due to rising production and distribution costs. These difficulties have adversely impacted agricultural output, lowered profitability, and disrupted supply chains, limiting the effective transfer of food from rural producers to urban consumers. In summary, the findings highlight that removing fuel subsidies without complementary supportive policies can exacerbate poverty and threaten national food security. Thus, a balanced, inclusive, and strategically coordinated policy framework is essential to ensure that economic reforms align with sustainable agricultural development and improved livelihoods.

#### References

- Adeola, A. (2010). OECD Policy Paper. Retrieved from <http://www.oecd.org/dataoecd/58/61/42987402.pdf>
- Adenikinju, A. (2005). Analysis of the Cost of Infrastructure Failures in a Developing Economy: The Case of the Electricity Sector in Nigeria. AERC Research Paper 148, African Economic Research Consortium, Nairobi.

- Adeyeye, A. B., Akinmoladun, O. M., & Amusa, O. B. (2021). The impact of fuel subsidy removal on inflation and food security in Nigeria. *African Economic Review*, 35(3), 98–112.
- Adinnu, C. (2023, July 21). Addressing the effects of fuel subsidy removal on food insecurity. *African Liberty*. <https://www.africanliberty.org/2023/07/21/addressing-the-effects-of-fuel-subsidy-removal-on-food-insecurity/>
- Akinwumi, J. A., Olufemi, A. R., & Akindele, S. O. (2016). The economic impacts of fuel subsidy removal on agriculture in Nigeria. *Journal of Agricultural Economics*, 42(2), 77–84.
- Bazilian, M., & Onyeji, I. (2012). Fossil fuel subsidy removal and inadequate public power supply: Implications for businesses. *Energy Policy*, 45, 1–5. <https://doi.org/10.1016/J.ENPOL.2012.02.057>
- Belyaeva, O., Zaitseva, N., & Tsymbal, O. (2022). Sustainable agricultural systems and food security: Linking resource management and self-sufficiency. *Journal of Sustainable Agriculture*, 34(2), 205–222.
- Budgit. (2023). Economic sensitivity of petroleum subsidy removal in 2023. <https://budgit.org/wp-content/uploads/2023/05/Economic-Subsidy.pdf>
- Chatri, F., Malaysia, U., & Othman, J. (2014). Economy-wide effects of fuel subsidy removals in Malaysia.
- Clements, B., Coady, D., Fabrizio, S., Gupta, S., Alleyne, T., & Sdrulevich, C. (2013). Energy subsidy reform: Lessons and implications. <https://doi.org/10.5089/9781484389928.071>
- Diao, X., Andam, K. S., Iraoya, A. O., & Pauw, K. (2024). Tracing the effects of Nigeria's fuel subsidy reform: Evidence on fuel consumption patterns. CGIAR Research. <https://cgspace.cgiar.org/bitstreams/61ce4a6d-7c7c-4bdb-81de-b7b3cb0bb6f5/download>
- Eboh, C. (2023). Nigeria's NNPC spent \$10 billion on fuel subsidy in 2022. Reuters. <https://www.reuters.com/business/energy/nigerias-nnpc-spent-10-billion-fuel-subsidy-2022-2023-01-20/>
- Ezekiel, A. M. (2024). Effects of petroleum products price hike on the supply of agricultural products in Nigeria – A review. *FUDMA Journal of Agriculture and Agricultural Technology*, 10(3), 19–25. <https://doi.org/10.33003/jaat.2024.1003.03>
- Fineman, M. A. (2010). The vulnerable subject and the responsive state. *Emory Law Journal*, 60, 251. <https://heinonline.org/HOL/LandingPage?handle=hein.journals/emlj60&div=10&id=&page=>
- Foley, M. (2018). Strategies to mitigate the effects of fuel subsidy removal on food security in Nigeria. *Food Policy Review*, 24(4), 203–215.
- Fosu, A. K. (2013). The implications of fuel subsidy removal for food security in Sub-Saharan Africa. *Journal of Development Studies*, 49(7), 102–117.
- Hanumanthappa. (2023). An overview of David Easton and the political system. *International Journal of Political Science (IJPS)*, 9(1), 14–16. <https://doi.org/10.20431/2454-9452.0901002>
- Hoddinott, J., Sandstrom, S., & Upton, J. (2018). The impact of cash and food transfers: Evidence from a randomized intervention in Niger. *American Journal of Agricultural Economics*, 100(4), 1032–1049. <https://doi.org/10.1093/ajae/aay019>
- Idisi, P. O., & Musa, A. S. (2024). Preference for compensational palliatives for the removed fuel subsidy in Nigeria: A case study of Kogi State. *SADI Journals*. <https://sadijournals.org/index.php/IJAES/article/view/48>

- Izuaka, M. (2023). Retaining petrol subsidy in 2023 will cost Nigeria nearly N6.7 trillion. Premium Times. <https://www.premiumtimesng.com/news/top-news/544279-retaining-petrol-subsidy-in-2023-will-cost-nigeria-nearly-n6-7-trillion-govt.html>
- Jewell, J., McCollum, D., Emmerling, J., Bertram, C., Gernaat, D. E. H. J., Krey, V., ... & Riahi, K. (2018). Limited emission reductions from fuel subsidy removal except in energy-exporting regions. *Nature*, 554(7691), 229–233. <https://doi.org/10.1038/nature25467>
- Jung, I. (2023). Food insecurity in Nigeria: Food supply matters. *Selected Issues Papers*, 2023(018). <https://doi.org/10.5089/9798400236921.018.A001>
- Kadelu, A. O. (2024). Food price inflation: Causes and changes in consumer behavior in South-West Nigeria. *Estonian University of Life Sciences*. <https://dspace.emu.ee/items/f8974d50-ca46-4ff4-8639-1e04e025a2e5>
- Kohn, N. A. (2014). Vulnerability theory and the role of government. *Yale Journal of Law and Feminism*, 26, 1. <https://heinonline.org/HOL/LandingPage?handle=hein.journals/yjfem26&div=5&id=&page=>
- Li, Y., Shi, X., & Su, B. (2017). Economic, social and environmental impacts of fuel subsidies: A revisit of Malaysia. *Energy Policy*, 110, 51–61. <https://doi.org/10.1016/J.ENPOL.2017.08.015>
- Lin, B., & Li, A. (2012). Impacts of removing fossil fuel subsidies on China: How large and how to mitigate? *Energy*, 44, 741–749. <https://doi.org/10.1016/J.ENERGY.2012.05.018>
- Main, P. (2023). Systems theories. *Structural Learning*. <https://www.structural-learning.com/post/systems-theories>
- Matemilola, S., & Elegbede, I. (2017). The challenges of food security in Nigeria. *OALib*, 04(12), 1–22. <https://doi.org/10.4236/oalib.1104185>
- McCulloch, N., Moerenhout, T., & Yang, J. (2021). Fuel subsidy reform and the social contract in Nigeria: A micro-economic analysis. *Energy Policy*, 156. <https://doi.org/10.1016/j.enpol.2021.112336>
- Meludu, N. T., & Komolafe, O. J. (2024). Influence of fuel subsidy removal on the prices of major food commodities in Southeastern Nigeria. *West African Journal on Sustainable Development*. <https://journals.unizik.edu.ng/wajsd/article/view/2928>
- Monasterolo, I., & Raberto, M. (2019). The impact of phasing out fossil fuel subsidies on the low-carbon transition. *Energy Policy*. <https://doi.org/10.1016/J.ENPOL.2018.08.051>
- Monsuru, A. S. (2024). Impact of fuel subsidy removal on household spending in Nigeria. *International Journal of Social Science and Economic Research*, 09(01), 29–41. <https://doi.org/10.46609/ijsser.2024.v09i01.002>
- Montuori, A. (2015). Systems theory. *ScienceDirect Topics*. <https://www.sciencedirect.com/topics/psychology/systems-theory>
- Noah, A. (2024). Impact of fuel subsidy removal on Nigeria's supply chain: A case study analysis. *ResearchGate*. <https://www.researchgate.net/publication/381106257>
- Norhasmah, S., Kamaruzaman, S. M., & Rajendran, T. (2010). Food security dimensions: Availability, accessibility, acceptability, and adequacy. *Food Security Journal*, 8(2), 145–160.
- Nuhu-Koko, A. (2011). Addicted to fuel and electricity subsidies: Getting the reform agenda right. *Nigerian Village Square*. <http://www.nigeriavillagesquare.com/articles/abubakara-nuhu-koko/addicted-to-fueland-electricity-subsidiesgetting-the-reform-strategies-right.html>

- Ogundipe, A. A., Daramola, A. O., & Adedokun, F. (2013). The effects of fuel price hikes on the cost of food production in Nigeria. *Nigerian Economic Journal*, 42(2), 56–66.
- Ojo, M. (2015). Impact of fuel price deregulation on food security in Nigeria. *Nigerian Journal of Agricultural Economics*, 8(2), 101–115.
- Ojo, E. O., & Adebayo, P. F. (2012). Food security in Nigeria: An overview. *European Journal of Sustainable Development*, 1, 199–222.
- Oluwabukola, A. (2023). Here is why Nigeria needs to remove petrol subsidy. *The Cable*. <https://www.thecable.ng/here-is-why-nigeria-needs-to-remove-the-fuel-subsidy/>
- Oluwatobi, S. O., & Ogunrinola, O. I. (2011). Government expenditure on human capital development: Implications for economic growth in Nigeria. *Journal of Sustainable Development*, 4(3). <https://doi.org/10.5539/jsd.v4n3p72>
- Onyedinefu, G. (2020). Unsustainable fuel subsidy gulped over N10trn in 14 years. *Business Day*. <https://businessday.ng/energy/oilandgas/article/unsustainable-fuel-subsidy-gulped-over-n10trn-in-14-years-fg/>
- OPEC. (2023). Nigeria facts and figures. Organization of the Petroleum Exporting Countries. <https://www.opec.org>
- Oxford Analytica. (2024). Nigeria's government will resist popular pressure. *Emerald Expert Briefings*. <https://www.emerald.com/insight/content/doi/10.1108/OXAN-DB289045/full/html>
- Oyakhilomen, O., & Zibah, R. G. (2014). Agricultural production and economic growth in Nigeria: Implication for rural poverty alleviation. *Quarterly Journal of International Agriculture*. <https://doi.org/10.22004/ag.econ.195735>
- Oyejide, T. A., & Adewuyi, A. O. (2011). Enhancing linkages of oil and gas industry in the Nigerian economy. *Semantic Scholar*. <https://www.semanticscholar.org/paper/Enhancing-linkages-of-oil-and-gas-industry-in-the-Oyejide-Adewuyi/a45eda1e4db5eb03e636946419f5e178f3f4baed>
- Oyekale, J. I., & Obi, G. C. (2024). Gardening as a contributory panacea to current household food scarcity due to fuel subsidy removal in Nigeria. *Federal Polytechnic Ilaro Journal of Science and Technology*. <https://sciencetechjournal.federalpolyilaro.edu.ng>
- Perez-Escamilla, R. (2017). Food security and planetary health: Sustainability at the intersection of food systems and ecosystems. *Global Health and Environmental Sustainability*, 29(3), 46–61.
- Pinstrup-Andersen, P. (2009). Food security and nutrition: A framework for understanding global challenges. *Global Food Security*, 12(3), 100–115.
- Ramp, W. (2014). The evolution of food security concepts and global challenges. *International Food Policy Review*, 6(1), 21–40.
- Riahi, K. (2018). Limited emission reductions from fuel subsidy removal except in energy-exporting regions. *Nature*, 554, 229–233. <https://doi.org/10.1038/nature25467>
- Schwanitz, V., Piontek, F., Bertram, C., & Luderer, G. (2014). Long-term climate policy implications of phasing out fossil fuel subsidies. *Energy Policy*, 67, 882–894. <https://doi.org/10.1016/J.ENPOL.2013.12.015>
- Stashkevych, L. (2024). Social justice, economic development, and environmental sustainability in food security. *Journal of Global Food Policy*, 27(4), 312–329.
- Stober, E. (2016). Nigeria's petroleum subsidy: In whose interest is it? *Academic Journal of Economic Studies*, 2, 58–70.

- Tella, S. O. (2017). Renewable energy and sustainable development: Prospects for agricultural sustainability in Africa. *Renewable Energy Review*, 45(1), 45–53.
- Uzoagba, C., Okoroigwe, E., & Kadivar, M. (2024). A review of biomass valorization for bioenergy and rural electricity generation in Nigeria. *Cureus Journals*. <https://www.cureusjournals.com/articles/65-a-review-of-biomass-valorization-for-bioenergy-and-rural-electricity-generation-in-nigeria.pdf>
- Victor, D. (2009). The politics of fossil-fuel subsidies. *Political Economy: Taxation*. <https://doi.org/10.2139/ssrn.1520984>
- Walls, M., Roberts, C., & Fernandez, M. (2019). The interconnectedness of food security with urbanization, income disparities, and ecosystem health. *Journal of Food Systems and Sustainability*, 13(5), 98–112.
- World Bank. (2019). Rural development and food security: A focus on the impact of fuel subsidy removal. World Bank Group Report.
- World Food Summit. (1996). Rome declaration on world food security and world food summit plan of action. FAO.
- Yusufu, A. A., & Ilevbare, I. T. (2024). Fuel subsidy removal and household expenditures in Obajana Kingdom of Kogi State, Nigeria. *Kashere Journal of Public Policy*. <https://journals.fukashere.edu.ng/index.php/kjpir/article/view/364>
- Zakour, M. J., & Gillespie, D. F. (2012). Vulnerability theory. *Community Disaster Vulnerability*, 17–35. [https://doi.org/10.1007/978-1-4614-5737-4\\_2](https://doi.org/10.1007/978-1-4614-5737-4_2)