



Effect of Fuel Subsidy Removal on Forest Conservation in Nigeria

Shehu Usman Aliyu, Areo Oluwagbemiga, Alafiatayo Bunmi Mercy
Department of Biology,
School of Secondary Education Sciences
Federal University of Education Zaria

ABSTRACT

This study investigates the environmental implications of Nigeria's fuel subsidy removal, with a focus on forest conservation in Zaria, Kaduna State. Using a descriptive survey approach and analyzing data from 272 randomly selected households, the research examines how rising fuel prices have influenced domestic energy choices. Findings reveal a statistically significant correlation between the removal of fuel subsidies and increased reliance on firewood and charcoal as alternative energy sources, which has accelerated deforestation rates. The study highlights the environmental trade-offs of economic policy reform, showing how energy poverty drives unsustainable exploitation of forest resources. It underscores the urgent need for targeted interventions—such as promoting clean energy alternatives and public awareness campaigns—to mitigate the unintended ecological consequences of fuel subsidy removal and support long-term forest conservation efforts.

ARTICLE INFO

Article History

Received: November, 2024

Received in revised form: February, 2025

Accepted: April, 2025

Published online: June, 2025

KEYWORDS

Effect, Fuel Subsidy, Removal, Forest Conservation, Zaria, Nigeria

INTRODUCTION

Fuel subsidy is not unique to Nigeria; it is a policy commonly observed in oil-producing countries worldwide. According to the Centre for Public Policy Alternatives fuel subsidy is particularly prevalent in oil-producing nations such as Venezuela, Iran, Saudi Arabia, Egypt, Burma, Malaysia, Kuwait, China, Taiwan, South Korea, Trinidad and Tobago, and Brunei, as well as in some non-oil-producing countries like Chad, Cameroon, and Niger, among others (Bello, Igheoise & Ahmed, 2024). In Nigeria, fuel subsidies have been in place since the 1970s, and the average household relies on subsidized oil for domestic and commercial purposes, including mobility, transportation, and power generation due to the intermittent supply of public electricity to individuals and small-scale businesses.

At the inception of this present administration around the middle of 2023, Nigerians were made to face the removal of fuel subsidy policy; and this has brought about enormous change to the entire economic atmosphere of Nigeria and its citizens. There were "sky rocketing" increases in the prices of every

item of trade and services in the Nigeria. Fuel subsidy policy removal revealed to all Nigerians the realities of Nigerian economic situation across all sectors, which indeed depended on fuel to thrive and consequently the prices of essential and non-essential goods and services for example: food items, electricity tariffs, transportation fare, cost of transporting farm produce from the farm and other food items to the market, manufactured food items from factories to market, drugs/medicines, school fees both in government and private institutions went higher than before now and to worsen the situation naira and dollar exchange rate became unstable and reaching the highest point for the first time in the history of Nigeria (Ogazie & Ekeke, 2024).

Subsidies in Nigeria have existed in various forms for many years, including cash, labor, exports, consumption, education, and housing. According to the Sun Newspaper (May 5, 2012), the idea of subsidizing petroleum products in Nigeria emerged after the collapse of the nation's four refineries. This collapse turned Nigeria from a significant producer of refined products to a net importer of petroleum products,

Corresponding author: Shehu Usman Aliyu

✉ kush61@yahoo.com

Department of Biology, School of Secondary Education Sciences, Federal University of Education Zaria

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such as petrol, kerosene, and diesel, for domestic use. By the mid-1990s, the Kaduna, Port Harcourt, and Warri refineries had failed due to poor maintenance. This failure led to a supply shortfall that the government addressed by importing petroleum products through the Nigerian National Petroleum Corporation (NNPC) to mitigate severe shortages and high prices nationwide (Miebimo & Michael, 2024).

The removal of fuel subsidy in Nigeria unarguably remains one of the most current matters arising in the Nigerian economic environment. Ideally, fuel subsidy represents financial assistance which the government provides for the reduction of fuel cost for the consumers so as to keep fuel prices lower and make fuel more affordable to the general population. This is the view of Akinnibi (2023). The Nigerian Economic Summit Group (2023) opines that the target of fuel subsidy in Nigeria is to reduce the fuel cost hence financial assistance is directly given to oil enterprises so as to lower the cost of fuel for the citizens.

For Nigerian environmentalists, the removal of fuel subsidies presents a mixed bag of challenges and opportunities. On one hand, the subsidy removal could potentially encourage a shift towards renewable energy sources and more sustainable transportation systems. With current fuel prices ranging from N900- N998, there may be greater incentive for individuals and businesses to adopt cleaner alternatives such as electric vehicles, biofuels, or solar-powered technologies. This could lead to a reduction in carbon emissions, air pollution, and other negative environmental impacts associated with the combustion of fossil fuels.

Supporting the above notion, Muhammad and Mikail (2025) opined that the subsidy removal might spur investment in renewable energy infrastructure and encourage the development of a greener economy. The funds previously allocated to fuel subsidies could be redirected towards initiatives promoting renewable energy research and development, energy efficiency programs, towards the implementation of Nigeria's Energy Transition Plan (ETP) which needs huge investments and

the establishment of sustainable transportation systems. Nigerian environmentalists have at this point an opportunity to advocate for these investments to accelerate the transition to a low-carbon future and mitigate the adverse effects of climate change.

On the other hand, the removal of fuel subsidies could also exacerbate certain environmental challenges. Higher fuel prices may discourage some individuals from utilising private vehicles and lead to a shift towards public transportation. Sounds like a great idea. However, Nigeria's public transportation infrastructure is currently inadequate, especially in rural areas where there is heavy reliance on old, inefficient vehicles that contribute to air pollution. If alternative transportation options are not improved or made readily available, the removal of fuel subsidies could result in increased use of polluting vehicles, thereby harming air quality and public health. Moreover, the removal of fuel subsidies may have an immediate impact on the general population. The fuel price hike has already triggered inflation, affecting the cost of essential goods and services. Transportation costs increase, which will eventually lead to higher prices for food, healthcare, and other necessities. This could disproportionately affect low-income Nigerians who already struggle to make ends meet. The potential socio-economic implications of the subsidy removal should not be overlooked, as they can contribute to social unrest.

Akinnibi (2023) asserts that removal of fuel subsidy implies bringing to an end, the financial assistance which government gives for fuel and such leads to the rising of prices to market levels. Usigbe (2023) opines that the Tinubu administration maintains that bringing the subsidy to an end is a way of encouraging climate action and investments in energy. He quotes President Tinubu as asserting thus: "the fuel subsidy is gone. The subsidy can no longer justify its ever-increasing costs in the wake of drying resources. We shall instead re-channel the funds into better investment in public infrastructure, education, healthcare and jobs that will materially improve the lives of millions".



The removal of fuel subsidies has a negative microeconomic impact in that it would raise poverty in the short term (Raji, 2019). Families will experience instant discomfort and hunger as a result. Individually, the elimination of fuel subsidies, without any palliatives, might result in less disposable money, less food on the land, less medicine for ill people, and an inability to pay for basic schooling in certain sections of the country, particularly in Nigeria's northern region. More families will be hungry, more children will weep because they are hungry, and more parents will cry because their children are depressed. Poor and middle-class customers' purchasing power will diminish, and small firms' profit margins will be squeezed as a result of rising expenses and lower sales volumes. Furthermore, the lack of funds may lead to a decline in infrastructure development, affecting transportation systems, healthcare facilities, and educational institutions. This could result in reduced access to essential services for the general population, exacerbating the already challenging conditions faced by vulnerable communities (Abdul, Pius- Ajibade & Moses, 2025).

The removal of petroleum subsidies reconfigures Nigeria's environmental landscape by reshaping patterns of energy access and exposure to environmental harm (Ayorinde et al., 2024). Middle- and upper- income households, often residing in electrified urban zones, can shift to generators or liquefied petroleum gas (LPG) when fuel prices rise. In contrast, lower-income households, particularly in peri-urban and rural areas, resort to biomass, charcoal, firewood, and kerosene, as coping mechanisms (Ike et al., 2020; Ogundipe et al., 2022). This unequal adaptation exacerbates environmental degradation, such as deforestation and air pollution, but it also reinforces class- based disparities in environmental risk exposure.

Environmental sociologists have long emphasized how ecological hazards, like indoor air pollution or deforestation-induced climate vulnerability, disproportionately affect the poor. In Nigeria, the subsidy removal acts as an environmental "redistributor," pushing marginalized populations toward dirtier and more

labour-intensive energy sources (Ayorinde et al., 2024). This reinforces what Beck (1992) described as a "risk society," wherein environmental burdens are unequally produced and unequally borne across social lines.

From a macro-environmental standpoint, subsidy removal may lead to reduced fossil fuel consumption, aligning with global climate targets. However, the short-term environmental reality is more complex. In the absence of clean energy alternatives, many households shifted to wood-based biomass, contributing to deforestation, soil degradation, and air pollution (UNEP, 2021; WHO, 2022). Nigeria already ranks among countries with the highest deforestation rates, and the post-subsidy energy shift exacerbates this trend.

A study by Ozili (2020) discovered that the removal of fuel subsidies can have significant environmental impacts, which include reduction of greenhouse gas emissions and other negative environmental impacts associated with fossil fuel use. However, the author also noted that the removal of fuel subsidies can lead to an increase in the use of alternative energy sources, among which is charcoal and firewood, which can have a serious negative environmental impact. (FAOUN, 2020) put forward that the removal of fuel subsidy led to deforestation, as people and businesses are incentivized to use wood for fuel. Thus, this can have dire consequences on forest conservation.

Forest conservation is beneficial to the natural environment as the forest acts as carbon sink, reservoir of biodiversity and critical habitat for wildlife, keep the land productive by conserving soil and water (Enamhe & Okang, 2019). It also serves as water catchment that recharges rivers and dams, which supply water for domestic use and hydroelectric power. Forests are designated as protected areas, which host game parks and forest reserves and contribute to the national economy by supplying renewable sources of energy in the form of wood fuel and charcoal. Protected area establishment, however affects the sustenance of the rural populace that relies on the forest for agriculture, energy, medicinal and other human needs.

Corresponding author: Shehu Usman Aliyu

✉ kush61@yahoo.com

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Effective forest conservation can also generate significant economic benefits for Nigeria. For instance, sustainable forest management can provide a steady supply of timber and other forest products, reducing the need for imports and generating foreign exchange earnings (WWF, 2019). Furthermore, eco-tourism and wildlife conservation can attract foreign investment and create jobs, contributing to poverty reduction and economic growth. Estimates suggest that Nigeria's forest ecosystem services could generate up to \$1.3 billion annually. By prioritizing forest conservation, Nigeria can unlock these economic benefits, support sustainable development, and improve the livelihoods of millions of people dependent on forest resources. Forest conservation is crucial for maintaining biodiversity, regulating climate change, and ensuring sustainable development. Nigeria's forests cover approximately 10% of the country's land area, providing ecosystem services and livelihood support for millions of people. However, deforestation and forest degradation pose significant threats to Nigeria's forests (Aiyedogbon, 2017).

When a forest is degraded it still exists, but it can no longer function well. It becomes a shell of its former self; its health declines until it can no longer support people and wildlife by, for example, filtering the air we breathe and water we drink or providing animals with food and places to live. There are a few main drivers of forest degradation. One is climate change: higher temperatures and unpredictable weather patterns increase the risk and severity of forest fires, pest infestation, and disease. But the main cause of forest degradation is unsustainable and illegal logging. It's a multi-million-dollar industry, built on the increased demand for cheap lumber, paper products, and fuel (Hancock, 2025).

When not done responsibly, loggers bulldoze roads into forests, extract as many high-value trees as possible, and drag the wood back out of the forest to sell. A forest degraded by illegal and unsustainable logging will have bare clearings, a spiderweb of roads, ravaged vegetation and undergrowth, and trenches carved into the forest floor. Forest degradation is also a

stepping-stone to deforestation. Once one logging company starts making roads deep into a forest, others follow behind. More loggers will come, but also miners, ranchers, and farmers who would not otherwise have had access (Hancock, 2025).

Fuel subsidy removal in Nigeria can indirectly contribute to deforestation due to increased reliance on firewood and charcoal for cooking and heating as a result of higher fuel costs. When the price of petroleum products rises, some households may switch to cheaper, albeit less sustainable, biomass sources like firewood and charcoal, which can lead to increased tree felling and forest degradation. This statement is supported with the view of Essien and Isacc (2012) who opined that the sudden removal of subsidies for cooking fuels could lead to a reliance on biomass for cooking and heat in some areas, thereby increasing pressure on forests.

STATEMENT OF THE PROBLEM

Nigerian government's removal of fuel subsidies has led to a significant increase in the prices of petroleum products such as kerosene, cooking gas, and petrol. While this policy aims to reduce fiscal burdens and redirect resources toward national development, it has unintentionally shifted the energy choices of many households, particularly in semi-urban and rural areas like Zaria, Kaduna State. As access to affordable fuel alternatives becomes limited, many households resort to using firewood and charcoal for cooking and heating, exerting more pressure on forest resources. This increased dependence on forest-based fuel threatens the sustainability of forest ecosystems, accelerates deforestation, and undermines local and national forest conservation efforts.

Despite the growing concern, there is a lack of empirical data assessing how the removal of fuel subsidies has directly influenced household behaviors toward forest use in Zaria. Existing studies have broadly examined energy transitions or forest depletion at the national level, often overlooking the localized effects of policy changes on forest conservation. Therefore, understanding the specific impact of subsidy removal on

household fuel choices and the resulting pressure on forests in Zaria is critical.

Objectives of the Study

The study objectives are as follows:

1. To determine the effect of fuel subsidy removal on the use of firewood and charcoal as alternative energy sources among households in Zaria, Kaduna State.
2. To assess the effect of fuel subsidy removal on the rate of deforestation among households in Zaria, Kaduna State.

Hypotheses

The following hypotheses were tested at 0.05 level of significance:

1. There is no significant relationship between fuel subsidy removal and the use of firewood and charcoal as alternative energy sources among households in Zaria, Kaduna State.
2. There is no significant relationship between fuel subsidy removal and the rate of deforestation among households in Zaria, Kaduna State.

METHODOLOGY

The study employed descriptive survey design. The population of this study was made up

of eight hundred and ninety-six (896) households Zaria, Kaduna State-Nigeria. The sample of this study was 272 households selected using simple random sampling technique. One instrument was used for data collection in this study. The instrument was divided into three sections, namely: section 'A', 'B' and 'C'. Section 'A' deals with information regarding fuel subsidy removal, section 'B' information on the use of firewood and charcoal as alternative energy sources and section 'C' information on rate of deforestation. The instruments were validated by experts.

In order to establish the reliability of the instrument, test re-test method of reliability was adopted. Cronbach alpha was used to calculate the reliability coefficient. A reliability coefficient of 0.789 was found. The data collected were analyzed using inferential statistics. Pearson Product Moment Correlation PPMC(r) was used to test the study hypotheses. The hypotheses were tested at a 0.05 alpha level of significance. SPSS version 25.0 was used for the analysis.

RESULTS

Ho₁: There is no significant relationship between fuel subsidy removal and the use of firewood and charcoal as alternative energy sources among households in Zaria, Kaduna State.

Table 1: Correlation between fuel subsidy removal and the use of firewood and charcoal as alternative energy sources

Variables	N	Mean	SD	Df	Correlation index r	P
Fuel subsidy removal	272	4.53	0.297	270	0.988**	0.000
Use of firewood and charcoal as alternative energy sources	272	4.52	0.286			

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

Table 1 indicated that Pearson Product Moment Correlation (PPMC) statistics showed that significant relationship exists between fuel subsidy removal and the use of firewood and charcoal as alternative energy sources among

households in Zaria, Kaduna State. This is because the calculated p value of 0.000 is lower than the 0.05 alpha level of significance. This implies that as fuel subsidy removal increases, use of firewood and charcoal as alternative energy sources also increases and vice versa. Therefore,

Corresponding author: Shehu Usman Aliyu

✉ kush61@yahoo.com

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the null hypothesis which states that there is no significant relationship between fuel subsidy removal and the use of firewood and charcoal as alternative energy sources among households in Zaria, Kaduna State is hereby rejected.

Ho₂: There is no significant relationship between fuel subsidy removal and the rate of deforestation among households in Zaria, Kaduna State.

Table 2: Correlation between fuel subsidy removal and deforestation rate

Variables	N	Mean	SD	Df	Correlation index r	P
Fuel subsidy removal	272	4.53	0.297	270	0.926**	0.000
Use of firewood and charcoal as alternative energy sources	272	4.56	0.270			

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

Table 2 indicated that Pearson Product Moment Correlation (PPMC) statistics showed that significant relationship exists between fuel subsidy removal and the rate of deforestation among households in Zaria, Kaduna State. Reason being that the calculated p-value of 0.000 is lower than the 0.05 alpha level of significance. This implies that as fuel subsidy removal increases, rate of deforestation also increases and vice versa. Therefore, the null hypothesis which states that there is no significant relationship between fuel subsidy removal and the rate of deforestation among households in Zaria, Kaduna State is hereby rejected.

DISCUSSION OF FINDINGS

The finding of this study revealed that significant relationship exists between fuel subsidy removal and the use of firewood and charcoal as alternative energy sources among households in Zaria, Kaduna State. Increase in fuel subsidy removal will lead to increases in the use of firewood and charcoal as alternative energy sources. This finding corroborates with that of Ozili (2020) who discovered that the removal of fuel subsidies can have significant environmental impacts, which include reduction of greenhouse gas emissions and other negative environmental impacts associated with fossil fuel use. The author also noted that the removal of fuel subsidies can lead to an increase in the use of alternative energy sources, among which is charcoal and firewood, which can have a serious negative environmental

impact. On a further note, the finding also resonate with that of Essien and Isacc (2012) they lamented that when the price of petroleum products rises, some households may switch to cheaper, albeit less sustainable, biomass sources like firewood and charcoal, which can lead to increased tree felling and forest degradation.

The finding of this study also revealed that significant relationship exists between fuel subsidy removal and the rate of deforestation among households in Zaria, Kaduna State. Increase in fuel subsidy removal will lead to increases in the rate of deforestation. This finding agrees with that of Ayorinde et al., (2024) who found that the removal of petroleum subsidies reconfigures Nigeria's environmental landscape by reshaping patterns of energy access and exposure to environmental harm. Middle- and upper- income households, often residing in electrified urban zones, can shift to generators or liquefied petroleum gas (LPG) when fuel prices rise. In contrast, lower-income households, particularly in peri-urban and rural areas, resort to biomass, charcoal, firewood, and kerosene, as coping mechanisms. This unequal adaptation exacerbates environmental degradation, such as deforestation and air pollution. Similarly, in Nigeria, the subsidy removal acts as an environmental "redistributor," pushing marginalized populations toward dirtier and more labour-intensive energy sources. This reinforces what Beck (1992) described as a "risk society," wherein environmental burdens are unequally produced and unequally borne across social lines.

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✉ kush61@yahoo.com

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CONCLUSION

The study concludes that fuel subsidy removal has a significant impact on energy consumption patterns and environmental sustainability in Zaria, Kaduna State. Specifically, the removal of fuel subsidy is associated with increased use of firewood and charcoal among households, which in turn contributes to higher rates of deforestation.

RECOMMENDATIONS

Based on the findings of this study, it is recommended that:

1. The government should promote and subsidize affordable and cleaner alternative energy sources, such as liquefied petroleum gas (LPG) and solar energy, to reduce dependence on firewood and charcoal.
2. Public awareness campaigns should be intensified to educate households on the environmental consequences of deforestation and the benefits of sustainable energy use.

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