

Petrol Subsidy Removal as an Instrument for Greenhouse Gases Reduction in Nigeria

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Abstract

The removal of petrol subsidy in Nigeria has significantly reduced fuel consumption among the nation's citizens from January 2023 to August 2023 and has caused untold hardship on the citizens of Nigeria. However, it is important to understand from environmental perspective that this development has contributed to a significant decline in green gases emission thereby reducing the negative impact on climate change. The aim of this research is to study the effect of petrol subsidy removal as an instrument for greenhouse gases reduction in Nigeria. Furthermore, a cross-section of Nigerians was interviewed on subsidy removal on petrol, however, 65 percent of low-income, 25 percent of middle-income earners while 10 Percent of higher-income earners have shown their dismay on subsidy removal in the country. This study adopted a qualitative and quantitative research approach so as to adequately describe the study's aims and objectives. The data for this study were collected through primary and scientific database sources, web search engines, direct observation and relevant documents from the Nigeria Midstream and Downstream Petroleum Regulatory Authority (NMDPRA), International Monetary Fund, Climate Transparency Report and Nigerian News Papers.

Keyword: Petrol, Subsidy, Removal, Green, House, Gases, Reduction

Introduction

Subsidy implementation originated with the aim to safeguard consumers by providing low prices of commodities though at a significant cost [3]. For decades, various economic sectors in Nigeria including the petrochemical, education, electric, forex sectors etc. have been subsidized in numerous ways [1]. Price water house Coopers Limited (2022) revealed that the invention of fuel subsidies began in the 1970s and became longstanding in 1977 following the promulgation of the Price Control Act which made it illegal for some products (including petrol) to be sold above the regulated price. The study showed that although the concept of subsidy itself is ethical, its implementation in Nigeria has been plagued with serious allegations of corruption and mismanagement.

As revealed by the World Bank (2022) report, Nigeria's total revenue in 2000 was USD 10.8 billion and by 2010 this amount increased to USD 67.9 billion, although the Nigerian government has spent over USD 30 billion on fuel subsidies over the past 18 years. Furthermore, they expressed that the government had to borrow N1trn to finance fuel subsidy in 2022, hence increased the country's public debt stock as exposed by the Debt Management Office [2].

Globally, fossil fuel subsidy was recorded as \$7 trillion or 7.1 percent of GDP in 2022 showing a significant \$2 trillion from 2020 report. Nevertheless, by 2030 they are projected to rise to \$8.2 trillion reflecting the proposition of fuel consumption in emerging markets due to missed consumption taxes, large price gaps, undercharged environmental costs, undercharged supply costs and various other factors [3].

The Guardian Newspaper reported on May 29, 2023, that the newly inaugurated President Bola Ahmed Tinubu (PBAT) cited the unsustainable nature of fuel subsidy and announced its termination in Nigeria. This announcement generated lots of mixed reaction among the nation's citizens; while some expressed support on the matter, others had reservations regarding the development. The removal of petroleum subsidy came at the time Nigerians are experiencing the challenging effect of greenhouse gas emissions from industries and vehicles plying its roads. Consequently, this decision was viewed by a number of scholars in the environmental management sector as a step in the right direction [4].

Academicians and environment enthusiasts in Nigeria and globally have intensively debated on the need to phase out fuel subsidies as a precautionary measure to lower greenhouse gas emission. Though most studies in this area have been championed by industrialized

nations, as far we know, no country-specific research in Africa or African panel study has tackled this mandate, leaving a gap in the literature of energy and environmental economics as well as environmental sustainability [5]. Notwithstanding, Nigeria creates an interesting platform to establish a clear line of thought on fuel subsidies' relevance in controlling greenhouse gas emissions as the largest African oil exporter, while embarking on large fuel subsidy for a long time until it was abolished recently [6].

In the same view, fuel subsidy removal is a way forward for the environmental ecosystem as this development will reduce the emission of greenhouse gases generated on a daily basis [7]. However, despite recent advancements in the environmental degradation literature in Nigeria, policymakers and society stakeholders are still at a loss explaining environmental changes emanating from increased carbon emission. Nigerians are unable to assess the country's current economic performance within the ecological degradation discourse due to the structural ambiguities plaguing the country. The growth equation leading to gross domestic product (GDP) has consistently omitted the in-depth cost of environmental degradation when accounting for nominal growth [8].

For an operating and safe Nigeria, it is expected that the economic and human welfare gains from oil resources do not invent more detrimental greenhouse gas emission leading to environmental degradations [9]. Despite the global commitment to decarbonization, governments continue to incentivize fossil fuel use through support mechanisms, which have been put in place to assist producers and households. Though these supports have not been developed with the intention of subsidizing fossil fuels, consequently they do, leading to growth in the carbon dioxide emission with the size of these subsidies estimated at 6.8% of global GDP in 2020 [10].

The study on petrol subsidy removal as an instrument for greenhouse gases reduction in Nigeria is situated within the sustainable development goals (SDG) framework on climate action to hopefully achieve a zero-emission world by 2030. Hence, also addressing the no poverty goal context to express the prevalent economic crisis that grapple Africa's most populous nation. This further transcend to working based on the UN Agenda 2063 focused on the environmental goal to fulfil past and existing initiatives for growth and environmental sustainable development.

Literature

Land degradation, water stress, air pollution and biodiversity loss are significantly linked to Fossil Fuel Subsidies (FFSs) as a major contributing factor of the intensified global climate crisis. Further resulting to cause millions of deaths annually and perpetuate poverty in regions affected as studies have shown that these subsidies are inefficient and costly, often primarily benefiting the wealthy [11]. Likewise, International Institute for Sustainable Development (2021) expressed that adoption of FFS impedes the progress to achieve many of the sustainable development goals (SDGs) which in turn negatively affects health and the environment. The artificial reduction of the fossil fuel prices make investment in fossil fuel seem more profitable compared to clean energy alternatives (like renewables or electric vehicles) but promotes its wasteful consumption.

Why do we care about fossil fuel subsidies?

The policymakers, international organizations, NGOs and academic systems are increasingly calling for the discontinuation of inefficient FS as a critical part of efforts to meet ambitious global climate targets [12]. Relatively, World of Education (2023) underscores the fact that despite a recent increase in demand and the success of multiple countries at subsidy reform, revenue spent of FS have increased in many countries, including some of the world's wealthiest and most advanced democracies. Black S. et al (2023) reported that globally, FS has accounted for 7.1 percent of world GDP in 2022 and is expected to continue rising.

Insistent implementation of fuel subsidy has resulted to increase in higher borrowing by given nations, thus impeding their development and has led to economic crisis, consequently contributing to climate change and premature deaths from local pollution, which are unfortunately more targeted at the poor and mostly benefiting higher income households [3]. Studies have also shown that countries heavily invested in FS spend less of their national revenue on education hence reflective in the poor educational outcome of majority of the government education system [36].

The need to drive greater ambition on moving away from fossil fuel greening

One of the most pressing issues of our time Climate change and the manifold implications such as rising sea levels or a higher likelihood of extreme weather events are increasingly felt throughout our planet. After decades of none to little action, close to 200 nations are committed to holding the increase in the global average temperature to well below 2°C

above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels [13].

In addition, a range of methodologies and models have been applied to analyze questions surrounding fossil fuel subsidies, fossil fuel taxation and the environmental issues surrounding the fossil fuel, such as the World Energy Model as well as their impact on emissions and energy demand [14]. The Global Subsidy Initiative (GSI) of the International Institute for Sustainable Development has developed the GSI Integrated Fiscal (GSI-IF) model to analyze the impacts of reforming fossil fuel subsidies, introducing carbon pricing and repurposing subsidy savings and tax revenues on GHG emissions and energy consumption [17].

The apparent genuine effects and irrefutable threat climate change pose to humanity will be catastrophic if we do not implement immediate actions. By investing in education, innovation and honouring our climate commitments, we can make the necessary changes to safeguard our planet. Over and above that, these efforts offer significant opportunities to upgrade our infrastructure, create new jobs and enhance global prosperity [18].

According to Premium Time (2023), the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA) in 2023 said the country's daily consumption of petrol has drastically reduced following the removal of subsidy by the Federal Government. The daily consumption figure now stood at 48.4 million litres, down from the 66.9 million liters per day in the previous regime [37]. With this development, Nigeria is expected to drastically reduce her use of petrol product and further reduce emission of greenhouse gases from automobile, generators which will slightly improve environmental sustainability with the view to reduce impact of climate change [19].

Nonetheless, showing a 28% decline in the country's daily fossil fuel consumption by Reuters according to the report given by the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA), Nairametrics (2023) allegedly revealed that the decline in consumption results can be ascribed to the illicit smuggling of petroleum products to neighboring countries like Cameroon, Chad, Benin Republic and Niger [37]. Therefore, it is clear that merely reforming or eliminating fossil fuel subsidies will not suffice for a sustained reduction in emissions.

As demonstrated, affected countries must ensure they implement measures that completely eliminate fuel subsidies, remove subsidies from fossil fuel prices through proper taxation,

potentially reducing global emissions and establish effective processes that support the use of low-carbon petroleum products or make a complete switch to clean energy and green energy [21]. Governments can reduce emission through stronger policies that encourage low greenhouse gas emissions while also conserving resources and increasing revenue. These outcomes are crucial for national pandemic response and recovery measures [22].

Emission Reductions through Fossil Fuel Subsidy Reform (FFSR)

The more Fossil Fuel Subsidies (FFSs) are removed, the more the annual percentage of emission reductions increases; however, when that potential is exhausted and energy prices stabilize, the percentage of emission reductions starts to level off as well. Consequently, if all the FFSs were removed linearly between 2021 and 2025, the modelling results show that FFSR could achieve significant annual emission reductions across all countries that gradually increase from about 2% in 2021 to 6% in 2025 [35].

Making the consumption of fossil fuels more expensive will ensure FFSR reduces demand for fossil fuels and facilitate a switch to other more price-competitive, low-carbon alternatives. A similar trend can be seen for the percentage of emission reductions in recent months in Nigeria where large percentage of private cars user kept theirs at home. By implication, this development has drastically reduced emission of greenhouse gases into atmosphere [23].

The impact of petrol subsidy ban on climate change/GHG

The Nigeria fuel subsidy gulped up to 32.4% of the total national revenue in 2022, which was more than the combined budgetary allocations for health, education and social protection (World Bank, 2023). To environmentalists, it is the subsidies on fossil fuels, especially coal, diesel and petrol that are considered harmful and this is because such subsidies encourage extra consumption of fuels, which results in increased emissions of carbon dioxide (CO₂) and other air pollutants associated with the combustion of these fuels. They also deter the transition to renewable energy and hamper the achievement of emission reduction goals (Climate Action Network Europe, 2023), which aggravate climate change (through global warming) and air pollution.

Vohra et al (2021) revealed that air pollution caused by the burning of fossil fuels was responsible for 10.2 million premature deaths globally in 2018. Economic and environmental concerns necessitate a wide range of fossil fuel subsidy reforms globally and they range from partial to total reforms as well as gradual to instant removal of the

subsidies. Moreover, different countries embark on different approaches according to the socioeconomic realities and political will of the decision-makers.

32 countries across the globe (including Nigeria) are involved in modelling records which account for 77% of global CO₂ emissions and 72% of the global population revealed that the removal of fossil fuel subsidies can result in the reduction of greenhouse gases GHG by 11.8% (5.5 gigatons of CO₂ equivalent), saving up to US\$3 trillion by 2030 (Kuchl et al., 2021). Intergovernmental Panel on Climate Change (IPCC) projected that global removal of the subsidies is capable of reducing CO₂ and other GHG emissions by 4% and 10% respectively by 2030 (IPCC, 2023). However, another research reported that fossil fuel subsidies will not produce significant changes in GHG emissions except in energy-exporting regions (Jewell et al., 2018).

The first encounter Nigeria had with implementing the fossil fuel subsidy reforms by the total removal of subsidies on diesel was in 2003, kerosene in 2016 and petrol in 2023. The motives behind the reforms were both economic and environmental (21). On one hand, Federal Government of Nigeria (2021), reported that fossil fuel subsidies were being removed in order to cut down the nation's CO₂ emissions to the Paris Agreement commitment levels and to encourage a transition to cleaner fuels. On the other hand, World Bank (2023) attributed Nigeria's recent fiscal predicaments to the huge sum of money (N4.5 trillion in 2022) that was being deducted from the nation's oil revenues for subsidizing petrol (43).

MATERIAL AND METHODS

The research employed both primary and secondary data collection and the primary data was sourced from the cross section of some sampled Nigerians. Random sampling techniques were adopted for the study while interviewer questionnaire was the sampling procedure and observation used. The study used information from the Nigerian Midstream and Downstream Petroleum Regulatory Authority. Furthermore, the study was conducted to monitor the trend of number of vehicles on our road, use of generator to power our houses and determine the level of Green House Gases emissions.

Subsequently, the secondary data were largely source from Nigerian Newspaper, Journals reports from International Monetary Fund (IMF), World Bank (WB), Intergovernmental panel on Climate Change (IPCC), International Institute for Sustainable Development

(IISDG), International Education (IE) to mention but a few. Related articles, reports, and web page documents of those that met inclusion criteria for this study were selected and reviewed as well. The inclusion criterion was all the data related to Fuel Subsidy Removal, Green House Gases and Climate Change issues and challenges in Nigeria (2020 onwards).

Reports not wholly focused on the topic of this study were excluded. All the retrieved publications were reviewed with emphasis on the Fuel Subsidy Removal issues in Nigeria. This study was conducted from May 2023 to July 2023.

RESULTS AND DISCUSSION

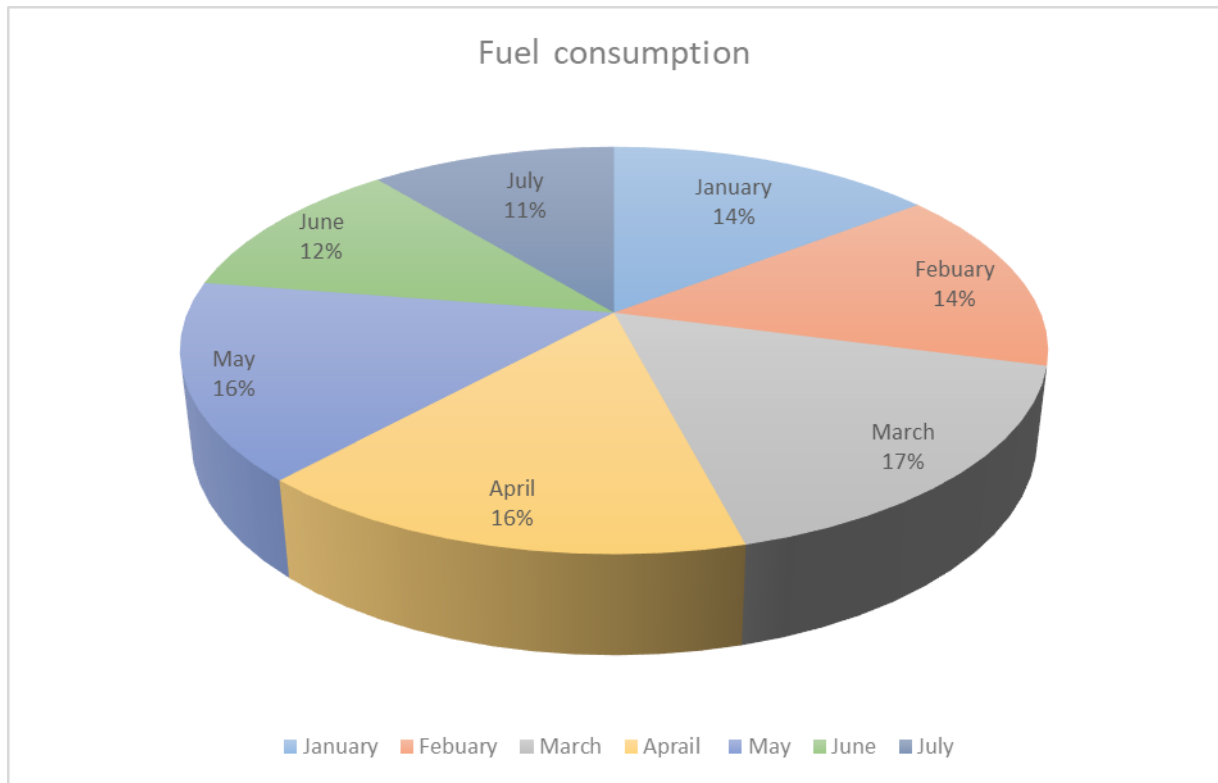
Reuter (2023) reported that in recent years, Nigeria's ecosystem has experienced increased number of vehicles plying its road in most of its major cosmopolitan cities such as Lagos, Abuja, Kano and Port Harcourt thereby increasing the emission of greenhouse gases observed prior to fuel subsidy removal. Furthermore, this development eventually promotes the possibilities to increase climate change issues such as global warming being experience in recent years, environmental degradation and flood etc. (42). The research findings are illustrated below;

Drastic Reduction in fuel Consumption

According to the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA), the Nigeria daily consumption of petrol has drastically reduced following the removal of subsidy by the Federal Government. Fuel subsidies caused artificially low fuel prices in many countries, which encouraged excessive consumption of fossil fuels. This high demand for cheap fuel in turn, contributed to higher greenhouse gas emissions (43).

Contrarily, the government may encourage more responsible and efficient use of energy resources by removing subsidies on fossil fuels, leading to reduced greenhouse gas emissions. The daily consumption figure now stands at 48.4 million liters, down from the 66.9 million liters per day before the elimination of subsidy. However, the chart below statistically shows the decline in petroleum consumption from January till date compared to last year (43).

Fuel Consumption in Nigeria as revealed in the chart below;



Source NMDPRA

This chart above reveals the fuel consumption series in Nigeria from January to July. Furthermore, the month of March experienced high consumption of fuel which represented 17% of total fuel consumed from January to July. This is equivalent to 71,400,000 million liters of petroleum consumed in Nigeria. These figures were due to increased population movement after the 2023 general elections and the seating president was declared winner. Subsequently, the other months of January and February represented the same figure of fuel consumption in Nigeria which was 14% (62,000,000 million liters) (43).

Furthermore, these statistics may be due to the result of the reduction of people inflow from locations as a result of the recently concluded elections. However, fuel consumption from month of April and May reflects slight decline in fuel consumption compared to the month of March. In these months, the statistics revealed that consumption in month April was 67,700,000 million liters and that of May was 66,600,000 million liters (43). As the full implementation of fuel subsidy removal commenced in June, the fuel consumption in

Nigeria further declined by 12% and 11% respectively which presented the fuel in month of June and July statistically to be 49,300,000 and 46,500,000 respectively.

Evidently, the removal of the subsidy has caused hardship for many Nigerians with its consequent increase in the prices of goods and services (44). However, the subsidy removal also led to increased government revenue with total distributable revenue increasing from about ₦786.161 billion in May to about ₦1.9 trillion in June increasing the government's revenue from the past subsidize petrol [19]. The subsidy removal revealed that the statistic of fuel consumption in Nigeria reduced by 33.58% [20]. From June 2023 to August 2023, this development invariably decreased the rate of greenhouse into atmosphere due to the reduction in numbers of vehicle that ply the roads on daily basis (42).

The Use of Petroleum per Month in 2023 before and after the subsidy removal

Before

1. January it was 62 million liters per day
2. February 62 million liters per day
3. March 71.4 million liters per day
4. April 67.7 million liters per day

After

1. May 66.6 million liters per day
2. June 49.5 million liters per day
3. July 46.3 million liters per day

Shift towards Renewable Energy

As a result of recent development, many households are shifting to embrace the use of solar energy through the installation of solar panel to generate electric energy for heat, cooling and other domestic activities, hence abandoning the use of generators to power homes (43). Significantly, a recent survey conducted by Nairametrics (2023) following the declaration to put an end to fuel subsidies by President Bola Tinubu on his May 29 announcement also revealed a notable decline in the sales of gasoline generator sets in Nigeria. The survey which covered major generator markets in Lagos reported that all the

generator dealers experienced a significant drop in sales, resulting to the fact that most of them were unable to sell more than half of their usual stock over the past months (21).

Concurrently, this decision is essential to fulfil the nation's obligations under the Paris Agreement and achieve the transition to a more sustainable energy system (22). The nation may further promote the emergence of clean and sustainable energy systems by removing price distortions and encourage stakeholder initiatives to adopt renewable energy (23). The subsidy removal could potentially encourage a shift towards renewable energy sources and more sustainable transportation systems which could lead to a reduction in carbon emissions, air pollution and other negative environmental impacts associated with the combustion of fossil fuels (24). With current fuel prices ranging from ₦620 to ₦700, there may be greater incentive for individuals and businesses to adopt cleaner alternatives such as electric vehicles, biofuels or solar-powered technologies (25).

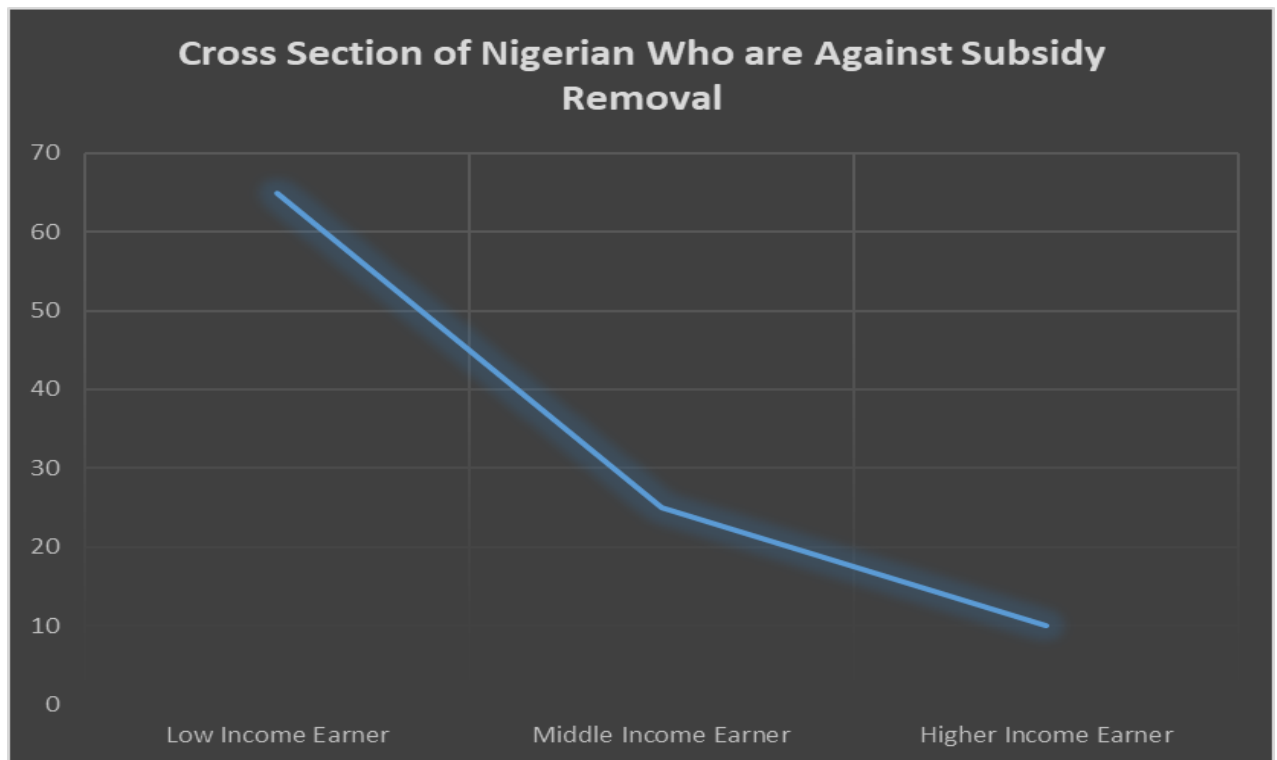
Technological Investment in area of Green Energy and Energy That Has Less Environment Pollution That Will Replace Petrol

Evidences suggest that the removal of subsidies from traditional fossil fuel industries could lead to a redirection of government funds towards research, development and implementation of greener technologies (24). Matallah et al (2023) revealed that in Algeria, this contributed to advancements including electric vehicles, energy storage and other low-carbon technologies that help reduce overall emissions. 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 [26]. Nonetheless, sustainable Renewable Energy (RE) comes with several other advantages such as offering alternatives, thereby diversifying energy resources and helping to achieve energy security [27].

It is inevitable to admit that the transition from fossil fuels to renewable energy is indispensable to achieving a cleaner future [28]. Invariably, research funding in Nigeria should be released in collaboration with research institutions like TETFUND and PTDF to sponsor young Nigeria researcher in areas of Engineering energy and other relevant career fields (46). The Federal government should ensure Compressed Natural Gas (CNG) is fully utilized to reduce the implication of petrol subsidy removal on transportation system by developing portable cylinder used in storing CNG for our vehicle. This will go a long way in reducing cost of transportation with less greenhouse gases emitted into the atmosphere thereby reducing the climate change impact (27).

Public Attitude toward removal of subsidy

The chart below reveals the findings stipulated from conducting a field report on fuel subsidy removal among a cross section of Nigerians interviewed regarding their opinion on the subsidy removal and its impact considering the varying economic status of the nation's citizens:



Statistically, the chart above revealed the opinion of Nigerians in regards to the subsidy removal on premium motor spirit. Although all classes of earners had considerable objection to the subsidy removal, about 70 percent of Nigerian elites seems to agree that fuel subsidy should be removed. In another hand, the middle-income earners also hold the similar opinion with the elite regarding subsidy removal petrol. However, the low incoming earners outrageously kicked against petroleum subsidy removal as they viewed this action as an attempt by the federal government to further push the citizens into poverty.

Synchronously, the removal of fuel subsidies has shown an immediate impact on the general population as the fuel price hike has outrageously triggered inflation, affecting the cost of essential goods and services (26). Transportation costs increase, which will eventually lead to higher prices for food, healthcare, and other necessities. Consequently, there were serious concern and complain from many Nigerians as the result subsidy removal (37). According to Felix (2023), Nigerian labour union and trade union staged a

protest showing their dismay on removal of subsidy with some other public figure, Islamic cleric and pastors seriously showed their concerns on the removal of subsidy and their opinion that the removal of subsidy was targeted toward the masses.

In a similar poll conducted by NOIPolls Limited (2023), it revealed that 10 percent of Nigerian adults disclosed they could no longer sustain their businesses. Another 10 percent complained that they now spent more on transportation fares while 3 percent criticized the high cost of goods and services. In addition, as a coping mechanism 2 percent expressed that they had reduced their spending while another 2 percent indicated that they had also reduced the number of days they worked, though 5 percent of Nigerians claimed the removal of subsidy had no impact on them (29). Furthermore, the findings revealed that 73 percent of adult Nigerians nationwide lamented about the negative impact of subsidy removal as the fuel cost affected their spending on other commodities [29].

Environmental Sustainability

Various researches show that the subsidy removal might prompt investment in renewable energy infrastructure and encourage the development of a greener economy (44). Additionally, the previously allocated fund to fuel subsidies could be rechanneled towards initiatives promoting energy efficiency programs, renewable energy research, the implementation of Nigeria's Energy Transition Plan (ETP) and development (45). These innovations need huge investments and Nigerian environmentalists have at this point identified opportunities to advocate for these investments such as the establishment of sustainable transportation systems to accelerate the transition to a low-carbon future and mitigate the adverse effects of climate change (30, 45).

To promote environmental sustainability, the National Council on Climate Change's initial analysis shows a potential 30 per cent decrease in everyday fuel usage, equal to 20 million liters or 42,800 tonnes of CO₂ emissions (31). The relationship between energy subsidies and the environment has strong policy implications for government in terms of ensuring environmental sustainability globally as fossil fuel subsidy represents a unique problem that unites economists and environmentalists (32). In the last few years, policy direction has shifted towards the reform or elimination of subsidies, particularly fossil fuel subsidies, hence the United Nations also included the achievement of environmental sustainability encompassed in the eleventh and thirteenth goal of the Sustainable Development Goals (46).

In conclusion, it is important to note that subsidy removal can also have adverse effects, especially on vulnerable populations but on the other hand, the elimination of fuel subsidies offers a special chance to harmonize economic, social, and environmental goals “Triple Bottom-Lines” with a focus on sustainability. Moreover, subsidy removal can be a driving force in reducing greenhouse gas emissions in Nigeria and globally by encouraging more sustainable energy use and promoting the adoption of greener technologies. However, its effectiveness will also depend on the government's commitment to invest in environmentally friendly initiatives and the promotion of responsible energy consumption.

Declaration

1. Data availability declaration: The authors declared the data available that warrant the research and these are the links to the data secured for research finding regarding the secondary data.
 - <https://www.premiumtimesng.com/business/business-news/610411-subsidy-removal-nigerias-daily-petrol-consumption-figure-reduces.html> [Accessed on 7 February2024].
 - <https://www.vanguardngr.com/2023/10/nigeria-records-33-58-reduction-in-fuel-consumption-says-nmdpra> [Accessed on 7 February2024].
 - <https://www.noi-polls.com/post/fuel-subsidy-removal-7-in10-nigerians-lament-over-the-negative-impact> [Accessed on 7 February2024].
2. There are no conflicting interests regarding the research work among the authors.
3. Funding: The research conducted was not funded by any organization and no grant was received for research.

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