Journal of Sustainable Development of Transport and Logistics
journal home page: https://jsdtl.sciview.net

Kwaghgba, G., & Tyozenda, A. J. (2024). The effect of economic policies on urban transport patterns: A review of motorcycle usage for urban mobility in Nigeria. *Journal of Sustainable Development of Transport and Logistics, 9*(2), 32-42. doi:10.14254/jsdtl.2024.9-2.3.

ISSN 2520-2979

The effect of economic policies on urban transport patterns: A review of motorcycle usage for urban mobility in Nigeria

Gbagir Kwaghgba *, Tyozenda Aondofa J. **

** Civil Engineering Department, Joseph Sarwuan Tarka University, Makurdi, Benue State, Nigeria*
*** Zwatif Engineers Ltd, Abuja, Nigeria*
tyozenda.aondofa@uam.edu.ng

Article history:

Received: August 05, 2024
1st Revision: August 25, 2024
Accepted: November 15, 2024

DOI:
10.14254/jsdtl.2024.9-2.3

Abstract: *Purpose*: This review examines the effects of Nigeria's economic policies, particularly the removal of fuel subsidies, on urban transport patterns, focusing on the increased use of motorcycles for daily commuting. *Methodology*: A comprehensive literature review was conducted, analyzing studies on motorcycle usage in urban areas of Nigeria and other developing countries and the impact of economic policies on transportation choices. *Results*: The study finds that removing fuel subsidies has significantly increased motorcycle usage in Nigerian cities, particularly among low-income earners. This shift has resulted in changes to traffic flow, increased road safety concerns, and environmental challenges due to motorcycle emissions. *Theoretical contribution*: The paper contributes to the understanding of how economic policies can rapidly transform urban mobility patterns in developing countries, highlighting the complex interplay between affordability, safety, and environmental sustainability in transportation choices. *Practical implications*: The review identifies several policy interventions, including enforcing safety regulations, creating dedicated motorcycle lanes, and improving traffic management systems. It also emphasizes the need for holistic transport policies that balance economic realities with safety and sustainability concerns.

Keywords: motorcycle transport, urban mobility, road safety, emissions, sustainable transport, electric motorcycles

Sustainable Development Goals (SDGs): SDG 11: Sustainable Cities and Communities; **SDG 3:** Good Health and Well-being; **SDG 9:** Industry, Innovation and Infrastructure; **SDG 13:** Climate Action; **SDG 8:** Decent Work and Economic Growth

Corresponding author: *Aondofa Tyozenda J.*
E-mail: jerome2online@gmail.com

1. Introduction

Nigeria, Africa's largest economy, has faced numerous economic challenges in recent years, including rising inflation, unemployment, and declining government revenues. As of October 2024, the inflation rate reached 33.88%, up from 32.70% in September, primarily driven by rising food prices (Reuters, 2024). The unemployment rate in Q2 2023 was 4.2%, a slight increase from 4.1% in Q1 2023 (Nigerian Bureau of Statistics, 2023). Additionally, Nigeria plans to spend 47 trillion naira ($28.18 billion) for its 2025 budget, with a projected deficit of 13.8 trillion naira, or 3.87% of the estimated GDP (Reuters, 2024). One of the significant economic policies implemented to address these challenges is the removal of fuel subsidies, which had long been a cornerstone of Nigeria's energy policy. For decades, fuel subsidies were introduced to shield Nigerian citizens from the full cost of fuel, ensuring relatively low prices for petroleum products. However, over time, these subsidies became unsustainable for the government, consuming a substantial portion of the budget. As part of fiscal reforms to stabilize the economy, the Nigerian government in 2023 gradually removed fuel subsidies, leading to a significant increase in fuel prices (Jesuola, 2024; Ogwuche et al., 2024). This policy change resulted in petrol prices rising from approximately ₦220 to ₦617 per liter in 2023, and further escalating to between ₦898 and ₦1,030 per liter in 2024 (Black Geeks, 2024).

The removal of fuel subsidies has profoundly impacted the transportation sector, particularly in urban areas where fuel is essential for both public and private transport. In cities such as Lagos, Abuja, and Port Harcourt, the increase in fuel prices has made conventional modes of transportation, such as buses, taxis, and personal cars, unaffordable for a significant portion of the population (Noah, 2024). As a result, there has been a marked shift in urban mobility patterns, with motorcycles becoming a dominant form of transportation. Motorcycles, commonly referred to as "okadas" in Nigeria, are relatively affordable in terms of fuel consumption and provide a flexible alternative for navigating the congested and poorly maintained roads of Nigeria's urban centers (Yakatun, 2023).

The increasing reliance on motorcycles as a primary mode of transport has introduced new dynamics in urban mobility. Understanding the traffic characteristics and patterns associated with this shift has become critical, as motorcycle usage significantly influences traffic flow, congestion, and road safety. According to Hagen, Pardo, and Valente (2016), motorcycles can maneuver through traffic more efficiently than cars, reducing travel time in densely populated areas. However, the widespread use of motorcycles has also led to increased traffic accidents, primarily due to poor regulation, reckless driving, and the lack of proper safety measures, such as helmet use (Yousif, Sadullah & Kassim, 2020). In Nigeria, motorcycles are disproportionately involved in road accidents compared to other vehicles. According to the National Bureau of Statistics, in Q3 2021, motorcycles accounted for 1,146 out of 4,946 vehicles involved in road traffic crashes, representing approximately 23% of the total (Nigerian Bureau of Statistics, 2021).

This high accident rate is primarily attributed to the often unregulated and informal nature of motorcycle operations and poor enforcement of traffic rules. Additionally, many motorcycle riders in Nigeria fail to adhere to basic safety practices, such as wearing helmets and following traffic signals, further exacerbating the safety concerns associated with increased motorcycle use.

In addition to safety concerns, the environmental impact of increased motorcycle usage is also significant. While motorcycles consume less fuel than cars, they tend to emit higher levels of pollutants per kilometer traveled due to less efficient combustion processes. Therefore, this shift in transport patterns has raised concerns about air quality and sustainability in urban areas (Lindsay, Macmilliam, & Woodward, 2011). Understanding these traffic characteristics and their broader implications for urban planning, road safety, and environmental sustainability is crucial for policymakers aiming to develop effective transportation policies that address economic and environmental concerns.

Thus, this review examines the effects of Nigeria's fuel subsidy removal on urban transport patterns, focusing on the increased use of motorcycles as a response to economic hardship. It highlights the implications of this shift for traffic flow, road safety, and environmental sustainability, providing insights that can inform future transport policy reforms in Nigeria.

2. Methodology

A systematic literature search was conducted to gather relevant studies on the impact of fuel subsidy removal and the use of motorcycles in urban transportation across developing countries. The search included peer-reviewed journal articles, government reports, and conference proceedings. Databases such as Google Scholar, JSTOR, and ScienceDirect were used to identify pertinent literature. Keywords included "fuel subsidy removal," "motorcycle transport in developing countries," "urban mobility," "traffic flow," and "road safety." Studies were selected based on their relevance to the research topic, with a focus on empirical data, regional applicability (particularly in sub-Saharan Africa and Southeast Asia), and publication within the last two decades. The selection criteria ensured that the reviewed literature provided a comprehensive overview of the economic, environmental, and safety implications of increased motorcycle usage in urban settings.

3. Motorcycle transport in developing countries: A global perspective

Motorcycle transport has become a prominent feature in the urban mobility landscape of many developing countries. As urban populations grow and public transport systems struggle to meet demand, motorcycles have emerged as a flexible, affordable, and readily available alternative for commuters. The use of motorcycles for urban transport has been studied extensively, particularly in regions like sub-Saharan Africa, Southeast Asia, and Latin America, where rapid urbanization and economic pressures have significantly influenced mobility choices. This section reviews the literature on motorcycle use in urban settings across developing countries and provides a comparative analysis of countries that have faced similar shifts in transport dynamics due to economic factors.

3.1. Literature on motorcycle use in urban settings

Motorcycles have become a crucial mode of transportation in many developing countries due to their affordability, flexibility, and adaptability to diverse road conditions. In many cities across Southeast Asia, for example, motorcycles are not just a mode of transportation but an essential part of daily life. In Indonesia, Thailand, and Vietnam, motorcycles account for a significant proportion of urban mobility, helping mitigate traffic congestion and poor public transportation infrastructure (Chin, 2013). According to Nguyen et al. (2021), Vietnam has one of the world's highest rates of motorcycle ownership, with more than 60% of households owning at least one motorcycle. This high ownership rate is driven by motorcycles being often the only affordable and practical means of transportation in densely populated urban areas.

Similarly, in sub-Saharan Africa, motorcycles have become a popular form of transport, particularly in countries like Nigeria, Kenya, and Uganda. In these regions, motorcycles—called "boda-bodas" in East Africa—are often the most efficient way to navigate congested cities with poor road infrastructure (Owino et al., 2024). For example, in Lagos, Nigeria, rapid urbanization and persistent traffic congestion have made motorcycles a practical alternative to cars and public buses. Additionally, motorcycle taxis have created employment opportunities for many young men who may not have access to formal employment (Ogunrinola, 2011).

The widespread use of motorcycles in developing countries is often a response to the failure of traditional public transport systems to meet the needs of growing urban populations. In many cities, public buses and trains are either non-existent or poorly maintained, leading to a significant gap in mobility options. In this context, motorcycles offer an informal but effective solution, providing point-to-point transport in areas where other vehicles struggle to operate due to road conditions or traffic congestion (El-Agroudy, Abou-Senna & Radwan, 2022).

3.2. Comparative analysis of shifts in transport dynamics due to economic factors

Several developing countries have experienced similar shifts in transportation dynamics due to economic factors, with motorcycles playing a pivotal role in shaping urban mobility. In many cases, economic crises, rising fuel prices, and the removal of government subsidies have increased reliance on motorcycles. For instance, in Indonesia, the 1997 Asian financial crisis resulted in widespread

unemployment and reduced household incomes, which pushed many people to turn to motorcycles as a more affordable means of transport (Basri, 2013). The motorcycle industry in Indonesia proliferated during this period, as motorcycles became an essential part of the urban transport system, allowing individuals to maintain mobility despite economic hardship.

In Latin America, particularly in countries like Brazil and Colombia, motorcycles have also become integral to urban transportation, especially among lower-income populations. According to Motta, Da Silva, and Santos (2013), economic instability and rising inflation in Brazil have contributed to the growth of motorcycle use, as they are cheaper to purchase, maintain, and operate compared to cars. Similarly, in Colombia, motorcycles have become a standard mode of transport due to high levels of unemployment and the expansion of the informal economy, where motorcycle taxis provide a critical source of income for many (Toro López & Van den Broeck, 2023).

In comparison to these regions, sub-Saharan Africa has seen a surge in motorcycle use, driven largely by economic policies such as removing fuel subsidies, as seen in Nigeria. The removal of fuel subsidies has increased the cost of fuel, making car ownership and public transportation more expensive and less accessible to the average commuter. As a result, motorcycles have become the preferred mode of transport for many urban dwellers (Guo et al., 2020). In Kenya, fuel price hikes and the high cost of living have similarly led to a dramatic increase in motorcycle ownership, with many young men turning to motorcycle taxis for income (Karema, Irandu & Moronge, 2017).

Across these countries, the shift towards motorcycle use reflects broader socio-economic trends, including the increasing cost of living, poor public transport infrastructure, and the need for flexible, low-cost transportation options. While motorcycles provide a vital solution to urban mobility challenges, they also present new challenges in terms of road safety, environmental impact, and urban planning.

4. Traffic flow and characteristics of motorcycle users in Nigeria

The use of motorcycles as a mode of transportation in Nigeria has significantly evolved, especially in urban areas, with notable changes occurring before and after the removal of fuel subsidies. Before the removal of subsidies, motorcycles already played a substantial role in the transport systems of many Nigerian cities, particularly in regions with limited access to formal public transportation services (Afolabi & Akibo, 2020). In cities like Lagos, Abuja, and Kano, motorcycles, commonly called "okadas," provided a quick and affordable alternative for short-distance travel, especially in traffic-congested areas. The relatively low cost of fuel made motorcycles an accessible option for both operators and passengers, contributing to their widespread use in urban centers (Eccarius & Lu, 2020).

However, after the removal of fuel subsidies in 2023, the prevalence of motorcycle use skyrocketed. With the sharp rise in fuel prices, many urban commuters found it increasingly challenging to afford traditional modes of transport, such as buses and taxis, which rely heavily on gasoline. Consequently, motorcycles became the preferred mode of transportation for a significant portion of the population, particularly low-income earners who were disproportionately affected by the increase in transportation costs (Kumar, 2011; Law, Ng, Poi, Guo, & Hu, 2023). This surge in motorcycle use has had a noticeable impact on urban traffic patterns as the number of motorcycles on the roads continues to increase.

Several studies have examined the impact of motorcycles on urban traffic flow in Nigeria. According to Sopranzetti (2018), motorcycles are characterized by their ability to weave through traffic, bypassing gridlocked cars and buses. While this offers an advantage in reducing travel time for riders, it also creates a chaotic traffic environment. The erratic behavior of motorcycle riders—often ignoring traffic rules, using sidewalks, and driving between lanes—increases road hazards and complicates traffic management. As a result, the overall traffic flow in cities like Lagos and Ibadan has become more unpredictable, with motorcycles contributing to congestion, especially during peak hours (Ogunkan & Eyatayo, 2022).

Traffic congestion in Nigeria's urban centers is a longstanding issue exacerbated by the widespread use of motorcycles. At major intersections, motorcycles frequently contribute to bottlenecks as riders attempt to navigate through slow-moving or halted traffic. The lack of dedicated motorcycle lanes and the limited enforcement of traffic laws allow riders to operate with little

regulation, often resulting in dangerous maneuvers at intersections and on major roads (Nasong'o, 2015; Arosanyin et al., 2013). A study by Ogunmodede and Emeahara (2016) found that motorcycle riders tend to disregard traffic signals, contributing to accidents and increased congestion at critical traffic points. Moreover, the lack of organized parking for motorcycles further aggravates congestion, as riders often park haphazardly on roadsides, reducing available space for other vehicles.

The removal of fuel subsidies has amplified the already significant presence of motorcycles in Nigeria's urban transport system. While motorcycles provide a critical solution to rising transportation costs, they also introduce challenges in traffic flow, congestion, and road safety. Addressing these challenges will require targeted policy interventions, including providing dedicated lanes and stricter enforcement of traffic laws.

5. Safety implications of increased motorcycle use

The rise in motorcycle use in Nigeria's urban areas, particularly following the removal of fuel subsidies, has brought about significant safety concerns. While providing an affordable and flexible transportation option, motorcycles have contributed to a notable increase in traffic accidents. Studies show that motorcycles are disproportionately involved in road accidents compared to other vehicles. According to Ezeme et al. (2023), motorcycles account for over 30% of road traffic crashes in urban areas, despite representing a smaller share of the total vehicle population. As of 2018, Nigeria had approximately 11.8 million registered vehicles, with motorcycles constituting a significant portion of this number (Paul, 2020). This disproportionate involvement in accidents highlights the need for targeted safety interventions for motorcycle users. This high accident rate is primarily attributed to the often unregulated and informal nature of motorcycle operations and poor enforcement of traffic rules.

One of the primary road safety challenges associated with increased motorcycle use is the lack of compliance with safety regulations. Many motorcycle riders in Nigeria fail to adhere to basic safety practices, such as wearing helmets and following traffic signals. A study by Abdi et al. (2022) found that less than 50% of motorcycle riders regularly wear helmets despite helmet laws in many cities. This non-compliance significantly increases the risk of severe injuries and fatalities in the event of an accident. Additionally, motorcycles are more vulnerable to road hazards, such as potholes and poor visibility, further contributing to accident rates.

Several policy interventions have been implemented to address these safety challenges, albeit with varying degrees of success. Helmet laws, for instance, are in place in many Nigerian cities, requiring riders and passengers to wear helmets. However, enforcement of these laws remains weak, and compliance rates are generally low, especially in densely populated urban areas (Uzondu et al., 2022). Dedicated motorcycle lanes have also been proposed as a potential solution to reduce accidents by segregating motorcycles from larger vehicles. While this approach has been implemented in some cities, such as Lagos, insufficient infrastructure and funding have limited its widespread adoption (Saini et al., 2022).

Traffic management systems represent another essential intervention in improving road safety. In cities where motorcycle use is prevalent, such as Ibadan and Abuja, traffic signalization and traffic wardens have been introduced at critical intersections to manage the flow of motorcycles. This has led to a slight reduction in accidents in areas where these measures have been strictly enforced (Ayeni & Iyeke, 2024). However, the overall effectiveness of these systems is hindered by insufficient resources and inconsistent application across different regions.

While motorcycles have become a vital mode of transportation for many Nigerians, the associated safety risks cannot be ignored. Effective enforcement of existing safety laws, dedicated infrastructure, and improved traffic management systems are essential to mitigating the safety challenges posed by increased motorcycle use.

6. Environmental and economic impacts of motorcycle transport

While offering economic advantages to low-income earners, motorcycle transport presents distinct environmental challenges, especially in urban areas. Motorcycles generally emit fewer greenhouse gases per kilometer than cars due to their smaller engine sizes and lower fuel

consumption. However, studies reveal that motorcycles often release higher levels of harmful pollutants, such as hydrocarbons (HC) and carbon monoxide (CO), than cars. According to Amarachi, Emeka, Christopher, Lovell, and Conrad (2016), motorcycles emit up to four times more hydrocarbons per kilometer than cars due to their less efficient combustion processes and lack of advanced emissions control technologies. This contributes significantly to the degradation of urban air quality, particularly in cities with high motorcycle usage, such as Lagos and Ibadan.

The economic benefits of motorcycle transport are particularly evident for low-income earners. Motorcycles are more cost-efficient than cars, making them an attractive option for daily commuting in urban areas. They consume less fuel, are cheaper to maintain, and have lower upfront costs, which appeals to those who cannot afford the rising costs of other forms of transportation, especially in light of the recent removal of fuel subsidies in Nigeria (Nadillah & Rifai, 2022). For many urban dwellers, particularly those working in the informal economy, motorcycles provide a lifeline by offering affordable mobility. Many authors, including Gujba et al. (2013), advocate that transport policy in Nigeria should prioritize and incentivize public bus transport, as it is a more environmentally and economically sustainable option compared to motorcycle transport. However, the rising fuel prices have made public transportation increasingly unaffordable for many citizens.

Despite the economic advantages, the widespread use of motorcycles has significant environmental implications, particularly concerning air quality. The high levels of pollutant emissions from motorcycles contribute to urban air pollution, which poses health risks to city residents. Studies by Quang et al. (2021) indicate that areas with high concentrations of motorcycle traffic experience elevated air pollutants, contributing to respiratory issues and poor urban air quality. This poses a challenge for sustainability in cities with high motorcycle reliance as governments seek to balance affordable transportation with environmental health. The lack of stringent emissions regulations for motorcycles further exacerbates these issues, with many older motorcycles still in use, emitting higher levels of pollutants than newer models.

While motorcycles offer cost-efficiency for low-income earners in Nigeria, they also contribute disproportionately to urban air pollution. Addressing the environmental impacts of motorcycle transport will require targeted policies, such as emissions regulations and incentives for cleaner technologies, to ensure that the economic benefits of motorcycle use do not come at the cost of urban sustainability.

7. Urban planning and infrastructure for motorcycle transport

Urban infrastructure plays a critical role in accommodating motorcycles, especially in cities where motorcycles are a dominant form of transportation. The growing reliance on motorcycles in Nigerian cities highlights the need for infrastructure tailored to their specific requirements. In many urban areas, the lack of dedicated infrastructure for motorcycles, such as separate lanes and parking spaces, creates significant challenges. Without proper infrastructure, motorcycles often operate in the same lanes as cars, buses, and trucks, leading to traffic congestion and accidents. Additionally, the absence of organized parking spaces for motorcycles exacerbates congestion in densely populated areas (Sabir & Anjum, 2017).

One of the significant challenges in urban road design for motorcycles is ensuring that roads and intersections are equipped to handle both the volume and behaviors of motorcycle users. Motorcycles require narrower lanes, but without dedicated motorcycle lanes, riders often weave between cars, increasing the risk of accidents. Furthermore, traffic signalization systems in many Nigerian cities do not account for the unique patterns of motorcycle movement, making intersections more chaotic and accident-prone (Makama, 2018).

Cities that have successfully adapted to increased motorcycle traffic provide valuable insights into the role of policy and design. For example, in some parts of Vietnam, where motorcycles dominate urban mobility, cities like Ho Chi Minh City have introduced dedicated motorcycle lanes and improved traffic management systems to segregate motorcycles from larger vehicles. This policy intervention has helped reduce traffic congestion and accidents (Nguyen, 2020). In Nigeria, similar policies, such as motorcycle-only lanes in Lagos, have shown promise in managing motorcycle traffic more effectively, although further development and enforcement are needed (Saini et al., 2022).

8. Potential policy interventions

Regulating motorcycle transport in Nigeria is essential to enhance road safety and improve urban traffic efficiency. One key recommendation is enforcing existing safety regulations, such as helmet laws, which require riders and passengers to wear helmets. Strengthening the enforcement of these laws could significantly reduce the number of fatalities and severe injuries associated with motorcycle accidents (Araujo et al., 2017). Additionally, introducing mandatory safety training programs for motorcycle riders can help improve driving behavior and adherence to traffic rules. Such training programs, along with regular road safety awareness campaigns, could foster a safety culture among motorcycle users.

Another critical intervention is the creation of dedicated motorcycle lanes in Nigerian cities. This policy has been successfully implemented in cities like Ho Chi Minh City, Vietnam, where segregating motorcycles from other vehicles has helped reduce traffic congestion and accidents (Nguyen, 2020). By designing urban roads with specific lanes for motorcycles, Nigerian cities could better manage traffic flow and ensure the safety of both motorcyclists and other road users. In addition to dedicated lanes, improving traffic signalization systems to account for motorcycles' movement patterns at intersections could also reduce chaos and accidents (Makama, 2018).

Integrating motorcycles into Nigeria's broader urban transport policies is another necessary step. Currently, motorcycles operate in a largely informal and unregulated manner, often excluded from formal transport planning. However, given their importance to the daily mobility of millions of Nigerians, they should be considered in the design and implementation of urban transport systems. For instance, cities could introduce motorcycle taxi regulations, as seen in Kampala, Uganda, where motorcycle taxis (boda-bodas) have been brought into the formal transport system through registration, licensing, and route mapping (Ng & Yi, 2016).

In addition to regulating motorcycle transport, Nigeria must explore alternative and sustainable transportation solutions to address its growing urban mobility challenges. As noted by Gao and Zhu (2022), sustainable urban transport development requires a multifaceted approach, emphasizing the electrification of transport systems and the adoption of intelligent transportation technologies such as shared mobility services, customized buses, and Mobility as a Service (MaaS). Furthermore, transit-oriented development (TOD) is essential in optimizing urban mobility. Expanding mass transit systems like bus rapid transit (BRT) and light rail could provide efficient and environmentally sustainable alternatives to motorcycles. If made affordable and accessible, these systems could significantly reduce the reliance on motorcycles and ease urban congestion (Mittal & Bansal, 2024). Additionally, investing in electric motorcycles as a cleaner alternative to gasoline-powered ones would help mitigate the environmental impacts associated with urban motorcycle use (Huu & Ngoc, 2021).

9. Conclusion

The rapid increase in motorcycle usage for urban mobility in Nigeria, particularly following the removal of fuel subsidies, has significantly transformed the urban transport landscape. This review has highlighted several key findings and implications:

- Economic Impact: Motorcycles have become a crucial mode of transport for low-income earners due to their cost-efficiency, offering an affordable alternative to traditional transport modes in the face of rising fuel prices.
- Safety Concerns: The surge in motorcycle usage has led to increased road safety risks, with higher accident rates and poor adherence to traffic laws. This underscores the urgent need for stricter enforcement of safety regulations and improved rider training programs.
- Environmental Challenges: While motorcycles offer some advantages in terms of fuel efficiency, their contribution to urban air pollution due to inefficient combustion systems and lack of emissions control technologies cannot be overlooked.
- Urban Planning Implications: The increased prevalence of motorcycles necessitates a rethinking of urban infrastructure design, including the implementation of dedicated lanes and improved traffic management systems.

- Policy Interventions: There is a critical need for comprehensive urban transport strategies that integrate motorcycles into formal transport policies while promoting safer and more sustainable alternatives.

From a practical standpoint, policymakers must prioritize the development of holistic transport policies that address both the economic realities of urban commuters and the safety and sustainability concerns associated with motorcycle use. This includes:

- Implementing and enforcing stricter safety regulations for motorcycle riders
- Investing in dedicated infrastructure for motorcycles to improve traffic flow and reduce accidents
- Exploring alternative, sustainable urban transport options such as improved public transit systems and electric motorcycles

From a scientific perspective, this review contributes to the growing body of literature on urban mobility in developing countries by highlighting the complex interplay between economic policies, transportation choices, and urban sustainability. It underscores the need for interdisciplinary research that combines economic analysis, urban planning, and environmental science to develop comprehensive solutions for urban mobility challenges.

Future research should focus on:

- Quantifying the environmental and health impacts of increased motorcycle usage in urban areas
- Evaluating the effectiveness of various policy interventions in managing motorcycle transport
- Exploring the potential of electric motorcycles and other low-emission vehicles as sustainable alternatives
- Investigating the long-term socio-economic impacts of shifting urban transport patterns on different population segments

In conclusion, while motorcycles currently play a vital role in urban mobility in Nigeria, there is a pressing need for more sustainable and safe transportation solutions. Addressing these challenges will require collaborative efforts from policymakers, urban planners, and researchers to ensure the well-being of urban commuters and the sustainability of Nigerian cities.

Acknowledgment

Funding

This research received no external funding.

Conflicts of Interest

The authors declare no conflict of interest.

Citation information

Kwaghgba, G., & Tyozenda, A. J. (2024). The effect of economic policies on urban transport patterns: A review of motorcycle usage for urban mobility in Nigeria. *Journal of Sustainable Development of Transport and Logistics, 9*(2), 32-42. doi:10.14254/jsdtl.2024.9-2.3

References

Abdi, N., Robertson, T., Petrucka, P., & Crizzle, A. M. (2022). Do motorcycle helmets reduce road traffic injuries, hospitalizations and mortalities in low and lower-middle income countries in Africa? A systematic review and meta-analysis. *BMC public health*, *22*(1), 824. https://doi.org/10.1186/s12889-022-13138-4

Afolabi, O. J., & Akibo, K. O. (2020). Urban challenges and informal public transport services in Nigeria. *Revista de Management Comparat International*, *21*(3), 319-331.

Amarachi, N., Emeka, O., Christopher, A., Lovell, A., & Conrad, E. (2016). Emissions of gasoline combustion by products in automotive exhausts. *Int J Sci Res Publ*, *6*(4), 464-2250.

Araujo, M., Illanes, E., Chapman, E., & Rodrigues, E. (2017). Effectiveness of interventions to prevent motorcycle injuries: Systematic review of the literature. *International journal of injury control and safety promotion*, *24*(3), 406-422. https://doi.org/10.1080/17457300.2016.1224901

Arosanyin, G. T., Olowosulu, A. T., & Oyeyemi, G. M. (2013). An examination of some safety issues among commercial motorcyclists in Nigeria: a case study. *International journal of injury control and safety promotion*, *20*(2), 103-110. https://doi.org/10.1080/17457300.2012.686040

Ayeni, T. S., & Iyeke, S. (2024). Evaluation of capacity and level of service for urban arterial road under mixed traffic conditions-a case study of oba Adesida road Akure, Nigeria. *Journal of Civil Engineering*, *15*(2), 152-165. https://doi.org/10.33736/jcest.6412.2024

Basri, M. C. (2013). *A tale of two crises: Indonesia's political economy*. Working Paper;57. https://doi.org/10.18884/00000660

BlackGeeks Nigeria. https://blackgeeks.com.ng/history-of-fuel-price-increase-in-nigeria/

Chin, H. (2013). Sustainable urban mobility in south-eastern Asia and the Pacific. *Global Report on Human Settlements. Regional Study Prepared for Global Report on Human Settlements*. http://www.unhabitat.org/grhs/2013

Eccarius, T., & Lu, C. C. (2020). Powered two-wheelers for sustainable mobility: A review of consumer adoption of electric motorcycles. *International Journal of Sustainable Transportation*, *14*(3), 215-231. http://www.unhabitat.org/grhs/2013

El-Agroudy, M., Abou-Senna, H., & Radwan, E. (2022). Mobility-as-a-Service: Simulation of multi-modal operations in low-density cities. *Transportation Research Record*, *2676*(2), 235-246. https://doi.org/10.1177/03611981211039843

Ezeme, C., Oladeji, E. O., Baiyewu, L. A., Okunola, M. O., & Ogunlade, S. O. (2023). Motorcycle road traffic injuries in a tertiary hospital in Nigeria: a reflection of the trauma care crisis. *Cureus*, *15*(12). https://doi.org/10.7759/cureus.51141

Gao, Y., & Zhu, J. (2022). Characteristics, Impacts and trends of urban transportation. *Encyclopedia*, *2*(2), 1168-1182. https://doi.org/10.3390/encyclopedia2020078

Gujba, H., Mulugetta, Y., & Azapagic, A. (2013). Passenger transport in Nigeria: Environmental and economic analysis with policy recommendations. *Energy Policy*, *55*, 353-361. https://doi.org/10.3390/encyclopedia2020078

Guo, Y., Wang, J., Peeta, S., & Anastasopoulos, P. C. (2020). Personal and societal impacts of motorcycle ban policy on motorcyclists' home-to-work morning commute in China. *Travel behaviour and society*, *19*, 137-150. https://doi.org/10.1016/j.tbs.2020.01.002

Hagen, J. X., Pardo, C., & Valente, J. B. (2016). Motivations for motorcycle use for Urban travel in Latin America: A qualitative study. *Transport Policy*, *49*, 93-104. https://doi.org/10.1016/j.tranpol.2016.04.010

Huu, D. N., & Ngoc, V. N. (2021). Analysis study of current transportation status in Vietnam's urban traffic and the transition to electric two-wheelers mobility. *Sustainability*, *13*(10), 5577. https://doi.org/10.3390/su13105577

Jesuola, G. D. (2024). *Impact of the Nigerian Government's Fuel Subsidy Removal: Data Analysis and Suggestions* (Master's thesis, Texas A&M University-Kingsville).

Karema, F. M., Irandu, E. M., & Moronge, J. M. (2017). The role of commercial motorcycles in alleviating poverty in rural areas: a case study of Laikipia East Sub-County, Kenya. *World Review of Intermodal Transportation Research*, *6*(2), 155-176. https://doi.org/10.1504/WRITR.2017.082733

Kumar, A. (2011). *Understanding the emerging role of motorcycles in African cities: a political economy perspective*. Sub-Saharan Africa Transport Policy Program. The International Bank for Reconstruction and Development: The World Bank.

Law, T. H., Ng, C. P., Poi, A. W. H., Guo, B., & Hu, Q. (2023). Motorcycle-to-car ownership at different urbanization levels: road mobility, accessibility, and income inequality. *Transportation research part D: transport and environment*, *122*, 103879. https://doi.org/10.1016/j.trd.2023.103879

Lindsay, G., Macmillan, A., & Woodward, A. (2011). Moving urban trips from cars to bicycles: impact on health and emissions. *Australian and New Zealand journal of public health*, *35*(1), 54-60. https://doi.org/10.1111/j.1753-6405.2010.00621.x

Makama, F. F. (2018). *Exploring Spatial Patterns and Trends of Vehicular Accidents in Abuja, Nigeria* (Doctoral dissertation, Faculty of Geo-Information Science and Earth Observation, University of Twente).

Mittal, P., & Bansal, R. (2024). Sustainable Transportation Solutions: Student Perspectives and Contributions. In *Community Engagement for Sustainable Practices in Higher Education: From Awareness to Action* (pp. 193-209). Cham: Springer Nature Switzerland. https://doi.org/10.1111/j.1753-6405.2010.00621.x

Motta, R. A., Da Silva, P. C. M., & SANTOS, M. P. D. S. (2013). Crisis of public transport by bus in developing countries: a case study from Brazil. *International journal of sustainable development and planning*, *8*(3), 348-361. https://doi.org/10.2495/SDP-V8-N3-348-361

Nadillah, R. S., Rifai, A. I., & Handayani, S. (2022). The efficiency analysis of motorcycle versus public transportation: a case of Cipinang-Tebet area route. *Indonesian Journal of Multidisciplinary Science*, *1*(1), 164-176. https://doi.org/10.55324/ijoms.v1i1.380

Nasong'o, W. M. (2015). *Motorcycle public transport services in Kenya* (Doctoral dissertation, University of Nairobi).

National Bureau of Statistics. (2024). Nigeria Labour Force Survey Q2 2023. https://nigerianstat.gov.ng/elibrary/read/1241429

National Bureau of Statistics. (2024). Road Transport Data (Q3 & Q4 2021). https://nigerianstat.gov.ng/elibrary/read/1241145

Ng, C., & Yi, S. (2016). Rethinking Sustainable Mobility: Understanding the use of boda-boda motorcycle taxis in Kampala, Uganda. *IIIEE Masters Thesis*.

Nguyen, D. V. M., Vu, A. T., Polders, E., Ross, V., Brijs, T., Wets, G., & Brijs, K. (2021). Modeling the injury severity of small-displacement motorcycle crashes in Hanoi City, Vietnam. *Safety science*, *142*, 105371. https://doi.org/10.1016/j.ssci.2021.105371

Nguyen, T. C. V. (2020). Strategies for integrated transport and urban development in Asian developing countries. *Masters Thesis*. Herausgeber: Technische Universität Darmstadt.

Noah, A. (2024). Impact of Fuel Subsidy Removal on Nigeria's Supply Chain: A Case Study Analysis, *International Journal of Studies in Business Management, Economics and Strategies*, *3*(4), 125-143.

Ogunkan, D. V., & Eyitayo, O. O. (2022). Pattern and characteristics of traffic congestion in Nigerian metropolitan centres: An example of Abeokuta Metropolis. https://doi.org/10.21203/rs.3.rs-2236559/v1

Ogunmodede, T. A., & Emeahara, E. N. (2016). Influence of demographic variables on the use of road safety information by commercial motorcycle riders in Nigeria. In *The African Symposium (TAS)* (Vol. 15, No. 3, pp. 44-51).

Ogunrinola, I. O. (2011). Informal self-employment and poverty alleviation: empirical evidence from motorcycle taxi riders in Nigeria. *International journal of economics and finance*, *3*(2), 176-185. https://doi.org/10.5539/ijef.v3n2p176

Ogwuche, D. D., Adejor, G. A., Dabish, N. D., Garba, R. I., & Dole, F. (2024). Assessing the Impact of Fuel Subsidy Removal on Economic Growth in Nigeria: A VECM Approach. *Lapai Journal of Economics*, *8*(1), 1-13. https://doi.org/10.4314/lje.v8i1.1

Owino, F., Peters, K., Jenkins, J., Opiyo, P., Chetto, R., Ntramah, S., ... & Hayombe, P. (2024). The urban motorcycle taxi sector in Sub-Saharan Africa: needs, practices and equity issues. *Urban, Planning and Transport Research*, *12*(1), 2354400. https://doi.org/10.4314/lje.v8i1.1

Paul, E. (2020, December 22). The state of Nigeria's automotive industry and its far-reaching effects. Techpoint Africa. https://techpoint.africa/2020/12/22/nigerias-automotive-industry/

Quang, T. N., Hue, N. T., Tran, L. K., Phi, T. H., Morawska, L., & Thai, P. K. (2021). Motorcyclists have much higher exposure to black carbon compared to other commuters in traffic of Hanoi, Vietnam. *Atmospheric Environment*, *245*, 118029. https://doi.org/10.1016/j.atmosenv.2020.118029

Reuters. (2024, November 15). Nigeria inflation rises for second month, spurred by food. https://www.reuters.com/world/africa/nigeria-inflation-rises-second-month-october-2024-11-15/

Sabir, S., & Anjum, G. A. (2017). Problems and prospects of curbside parking in Lahore: Policyimplications for effective management. *Mehran University Research Journal of Engineering & Technology*, *36*(4), 867-880. https://doi.org/10.22581/muet1982.1704.11

Saini, H. K., Chouhan, S. S., & Kathuria, A. (2022). Exclusive motorcycle lanes: A systematic review. *IATSS research*, *46*(3), 411-426. https://doi.org/10.22581/muet1982.1704.11

Sopranzetti, C. (2018). *Owners of the map: Motorcycle taxi drivers, mobility, and politics in Bangkok*. Univ of California Press. https://doi.org/10.22581/muet1982.1704.11

Toriola, A. (2023, September 4). History of fuel price increase in Nigeria from 1973 to 2024.

Toro López, M., & Van den Broeck, P. (2023). Informal transportation systems in the region of Urabá in Colombia through the lens of everyday forms of resistance. *Mobilities*, *18*(3), 468-488. https://doi.org/10.1080/17450101.2022.2109984

Uzondu, C., Jamson, S., & Marsden, G. (2022). Road safety in Nigeria: unravelling the challenges, measures, and strategies for improvement. *International journal of injury control and safety promotion*, *29*(4), 522-532. https://doi.org/10.1080/17457300.2022.2087230

Yakatun, M. M. (2023). *Analysis of livelihood impact of commercial motorcycle riders in Bida, Niger State* (Doctoral dissertation).

Yousif, M. T., Sadullah, A. F. M., & Kassim, K. A. A. (2020). A review of behavioural issues contribution to motorcycle safety. *IATSS research*, *44*(2), 142-154. https://doi.org/10.1016/j.iatssr.2019.12.001

Journal of Sustainable Development of Transport and Logistics (ISSN: 2520-2979) is published by **Scientific Publishing House "CSR", Poland, EU** and **Scientific Publishing House "SciView", Poland, EU**
Publishing with JSDTL ensures:
• Immediate, universal access to your article on publication
• High visibility and discoverability via the JSDTL website
• Rapid publication
• Guaranteed legacy preservation of your article
• Discounts and waivers for authors in developing regions
Submit your manuscript to a JSDTL at https://jsdtl.sciview.net/ or submit.jsdtl@sciview.net