The Effect of Public Transport Policies on Environmental Pollution at Nyerere Road in Dar es Salaam

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Abstract- The use of city buses (also known as public transportation or mass transit) is essential for many people worldwide, particularly in urban areas where the demand for mobility is high. However, the use of these buses has raised concerns due to their negative impact on the environment, economy, and social aspects. The study explored the effect of public transport policies on environmental pollution at Nyerere road in Dar es Salaam. Methodologically, the study used descriptive research design, the sample size for this study consisted of 80 respondents. Data were collected by using a questionnaire and documentary review and data were analyzed by using descriptive statistics by using the statistical package of social science together with content analysis for documentary data. The findings indicated that inadequate transport policies and regulations contributed to environmental pollution. This included a lack of clear regulations for public transport operators, weak enforcement of existing regulations, and a lack of coordination between different agencies responsible for transport. The study concluded that environmental pollution is still a growing challenge in developing countries and it needs a solution, among the key causes of this problem are inadequate transport policies and regulations towards sustainable road uses. The study advised the government and regulatory bodies should enforce existing transport policies and introduce new ones to reduce environmental pollution caused by city buses. Drivers and other road users should be educated on sustainable road transport practices, and passengers should demand sustainable transport services.

Index Terms- City Buses, Environmental Pollution, Transport Policies, Regulations, Sustainable

I. INTRODUCTION

The transport sector has a significant share of greenhouse gas (GHG) emissions worldwide, and urban transport contributes to more than 40% of total GHG emissions in some countries (Ramanathan and Gunasekaran, 2016). The use of city buses is one of the main contributors to this problem due to their high fuel consumption and poor maintenance practices (Aditjandra *et al.*, 2016). In addition, the poor air quality caused by vehicle emissions from city buses contributes to respiratory illnesses, cardiovascular diseases, and premature deaths (Lam and Bai, 2018). In response to these challenges, many countries have developed policies and regulations that promote sustainable transport modes, such as electric or hybrid buses, cycling, and walking (Halldórsdóttir *et al.*, 2016). These policies aim to reduce GHG emissions, improve air quality, and enhance the overall quality of life for residents walking (Halldórsdóttir *et al.*, 2016). However, the implementation of these policies remains a challenge in many countries due to limited resources, inadequate infrastructure, and weak enforcement mechanisms (Aditjandra *et al.*, 2016). Despite these challenges, some African countries have made significant progress in promoting sustainable transport modes. For example, South Africa has implemented a national transport policy that promotes sustainable transport modes, such as cycling and walking. The country has also invested in modernizing its public transport system, including the introduction of electric buses in some cities (Aditjandra *et al.*, 2016). However, many African countries still face significant challenges in implementing sustainable transport policies due to limited resources and inadequate infrastructure.

Inadequate transport policies and regulations also contribute to environmental pollution since city buses are allowed to operate even in worse conditions in Tanzania. The lack of effective policies and regulations that govern the operation of city buses has led to the proliferation of these buses, leading to congestion and poor transport services. The absence of proper regulations on vehicle emissions and fuel efficiency standards has contributed to the high levels of air pollution caused by these buses.
Previous studies such as that of Msigwa (2018) and Kimaro (2020) on the transport systems in Tanzania have focused mainly on the challenges of implementing sustainable transport policies and promoting sustainable transport modes. However, little research has been done on the causes of environmental pollution as a result of city buses operations resulting from inadequate transport

policies.Therefore, this study assessed the effect of city busses on environment pollution as a result of inadequate public transport policies.

II. LITERATURE REVIEW

This section of the study examines literature reviews, both theoretical and empirical. An empirical literature review presents different past opinions and thoughts of researchers who have conducted research on themes related to this study, as opposed to a theoretical literature review, which examines key study concepts connected to a study issue. The findings of numerous studies are linked, and study gaps are noted here.

A. Theoretical Literature

The social world is viewed by institutional theory as being mostly made up of institutions which are permanent norms, customs, and structures that provide the parameters for action. Institutional theory is a theoretical framework for analysing social phenomena, particularly organizational ones. Because they are ingrained in the social order and control how social life is lived, institutions are essential to understanding the social world (Litman, 2017). They are the constants that determine the rules of variation. In the context of this study, institutional theory could be used to explore how institutional norms and regulations influence the adoption of sustainable practices in the transport industry.

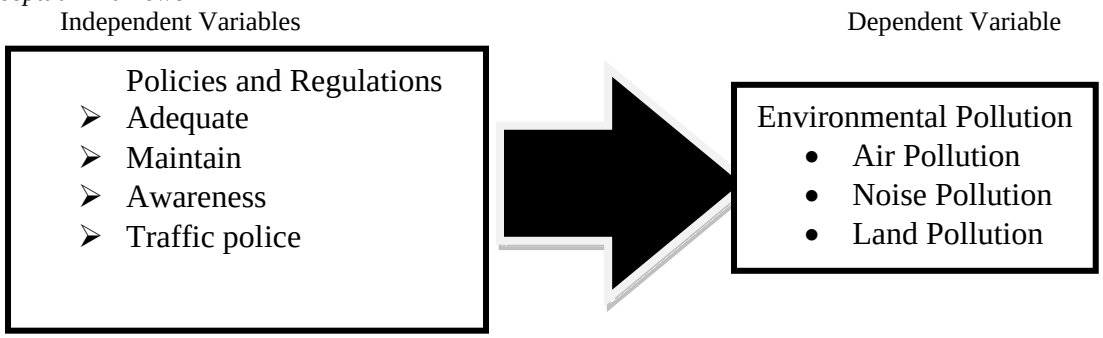
The study examines how government policies, industry standards, and stakeholder expectations shape the behaviour of transport companies regarding sustainable road use practices. These institutional norms and regulations create both incentives and barriers to the adoption of sustainable road use practices life (Litman, 2017). Institutional theory helps identify the factors that hinder the adoption of sustainable road use practices. The study examines how institutional norms and regulations differ across countries or regions, and how these differences create barriers to the adoption of sustainable road use practices in some context's life (Litman, 2017). Additionally, the study explore how industry standards and norms may shape the behaviour of freight companies and create barriers to the adoption of sustainable practices.

Overall, institutional theory provided a useful framework for understanding how institutional norms and regulations influence the adoption of sustainable road use practices in the road transport industry. By examining these factors, the study can help identify strategies for overcoming barriers to the adoption of sustainable practices and promoting more environmentally friendly transportation.

B. Empirical Literature

A study by Aditjandra *et al.*, (2016), in the UK examined the barriers to the adoption of sustainable freight practices among small- and medium-sized enterprises (SMEs). The study identified several barriers, including a lack of knowledge and awareness, a lack of funding, and a lack of regulatory support. The study suggested that training and education programs, financial incentives, and policy interventions could help overcome these barriers and promote the adoption of sustainable practices among SMEs. Similarly Durach *et al.*, (2017) focused on the European road transport industry and identified several barriers to the adoption of sustainable road use practices, including high implementation costs, a lack of standardized regulations and guidelines, and the fragmentation of the industry. The study suggested that collaboration among stakeholders, such as shippers, carriers, and policymakers, was essential for overcoming these barriers and promoting the adoption of sustainable practices. Jointly Ramanathan and Gunasekaran (2016), in Malaysia identified a lack of regulatory frameworks, inadequate infrastructure, and limited access to funding as key barriers to the adoption of sustainable road use practices. The study suggested that government policies, such as tax incentives and funding programs, could help overcome these barriers and promote the adoption of sustainable practices.

C. *Conceptual Framework*



III. RESEARCH METHODOLOGY

This section discusses various research methodologies.

A. Research design

The research design used in the study was descriptive. The descriptive research strategy was appropriate for this study since it aimed to provide decisive information on the environmental pollution brought on by city bus operations. Information was gathered to learn different viewpoints on the research subject (Kothari, 2014).

B. Population

Population consisted the road users of Nyerere road in Dar es Salaam, which included drivers, conductors, traffic police and passengers of the daladala, which consists of a high number of people whose number varies day-by-day due to different numbers of factors (Kothari. (2016)

C. Data collections methods

The study collected primary data by using a questionnaire and documentary review. Self-administered questionnaires were used in the study. These gave respondents the option to pick among the researcher's alternatives (Krishnaswami, 2013). A close-ended type of questionnaire was administered to respondents who were involved in the study who included bus drivers, traffic police and passengers; closed type of questions was used to obtain a specific opinion.

D. Data Analysis

The Statistical Package for Social Science (SPSS) was used by the researcher to analyses the quantitative data, and content analysis was utilized to analyze the qualitative data. The researcher analyzed the trends, language, and ideologies of the respondents. The results of the analysis were then collated and afterwards shown in tables, for easy comprehension.

IV. ANALYSIS AND DISCUSSION OF FINDINGS

The gathered information was coded, examined, and evaluated. An analysis and discussion of the results are provided below.

A. Descriptive Statistics

The study sought to examine the outcome or results of not having enough or inadequate transport policies and regulations towards environmental pollution in Dar es Salaam. Four questionnaire items prompted respondents to provide their opinions. The most relevant response options, from 4-strongly agree, 3-agree, 2-disagree, and 1-strongly disagree, were to be checked by respondents.

SN	Item	Mean	Std. Dev	Interpretation
1.	There are adequate transport policies and regulations towards environmental pollution	2.30	.58692	Disagree
2.	Daladala maintain the policies and regulations for sustainable road use	2.11	.63911	Disagree
3.	Daladala drivers are aware of the policies and regulations of sustainable road use and environment	2.06	.50750	Disagree
4.	Traffic police help to maintain the proper policies and regulations of sustainable road use and environment	2.33	.66399	Disagree

Findings showed a mean of 2.30 and a standard deviation of 0.58692, which indicated that there are inadequate transport policies and regulations towards unsustainable road uses and the environment. Adequate policies and regulations emphasize the sustainability of road infrastructure and the environment. However, respondents claimed that no regulations or policies were guiding the transport system, which was not true. Their claim implied that little education has been provided to road users to the extent that they are unaware of the existence of policies and regulations guiding transport. Thus, ignorance among road users towards policies and regulations guiding road transport contributes to unsustainability usage of road infrastructures and environmental pollution.

Findings showed a mean of 2.2 and a standard deviation of 0.63911, which indicated that daladala do not maintains the policies and regulations of sustainable road use and environment. Adherence to policies and regulations starts with recognition of presence and allowing people to comply with them. Therefore, since drivers had little knowledge of the policies and regulations guiding sustainability in road infrastructure and environment, there would be little compliance with policies and regulations guiding sustainable usage of road infrastructure and environment.

Findings showed a mean of 2.06 and a standard deviation of 0.50750, which indicated that daladala drivers are not aware of the policies and regulations of sustainable road use and environment. Awareness towards policies and regulations of sustainable usage of road infrastructure and the environment guarantees compliance with the respective policies and regulations. Thus, since there has been little effort to educate bus drivers on the policies and regulations, this has made many drivers poorly informed on the policies and regulations as well as lack of knowledge.

Findings showed a mean of 2.33 and a standard deviation of 0.66399, which indicated that traffic police's do not help to maintain the proper policies and regulations of sustainable road use and environment. Police traffic are the ones to enforce the policies and regulations guiding sustainable road uses and the environment. The claims from drivers are not true, it has been highlighted in some incidents that some law enforcers are accepting bribes in an incidence where there has been a violation of policies and regulations. However, this has been the belief among drivers contrary to the fact. It has been witnessed many trustworthy police traffic are involved in maintaining the policies and regulations guiding road infrastructure. Thus, untrustworthy police traffic decreases the fight against improper usage of road infrastructure leading to environmental pollution.

Findings showed that the mean score in each item was between 1.50 and 2.49 denoting disagreement. This implied according to respondents there are inadequate transport policies and regulations in the country, however, the lack of proper measures to enforce policies and regulations, like training for drivers and other motor vehicle users has resulted in a situation where road users especially bus drivers think there is inadequate policies and regulations transport in the country.

B. Discussion

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The study found that inadequate transport policies and regulations were among the contributors to environmental pollution in Dar es Salaam. The data collected showed that there were insufficient policies and regulations in place to regulate the number of buses operating on the road, resulting in congestion, delays, and increased emissions. Furthermore, the study found that the lack of enforcement of existing policies and regulations, such as speed limits and emissions standards, further exacerbated the negative impacts of transportation on the environment and public health.

Consistently from national transport policy

> *"Urban transport is constrained by low level of motorization currently estimated at 26 vehicles per 1,000 inhabitants. Journey delays due to traffic congestion on roads, rush for vehicles arising from equipment shortage and low capacity, unfriendly/unbecoming hostile behavior of bus crews are common features in Dar es Salaam urban transport".*
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> *"Further, road accidents are on the increase due to non-adherence and enforcement of rules and regulations. Disregard of proper infrastructure for Non-Motorized Transport (NMT) introduces a heavy penalty to the poorest section of the town dwellers. Services are concentrated to the major arterial roads with little penetration to neighborhoods and newly developed peri-urban areas. Environmental problems (noise, air and water pollution) are on the increase as a result of traffic congestion".*

These findings are consistent with previous research that has highlighted the importance of effective transport policies and regulations for promoting sustainable transportation. For example, a study by Mokhtarian *et al.,* (2012), in Greece found that the implementation of traffic management policies and regulations reduced traffic congestion and improved the efficiency of transportation. Similarly, a study by Wijetunga *et al.,* (2017), in Sri Lanka found that the effective enforcement of transport regulations, such as emissions standards and speed limits, reduced the negative impacts of transportation on the environment and public health.

The findings of this study had important implications for policymakers and stakeholders in the transportation sector. They suggest that there is a need for more effective transport policies and regulations to promote sustainable transportation and reduce the negative impacts of transportation on the environment and public health. This could involve developing policies to limit the number of buses

operating on the road, enforcing emissions standards and speed limits, and increasing public awareness of the negative impacts of transportation on the environment and public health.

However, there were limitations to this study that should be noted. Firstly, the study only focused on one road in Dar es Salaam, and the findings may not be generalizable to other areas. Secondly, the study relied on self-reported data from bus drivers and passengers, which may be subject to bias or inaccuracies. Lastly, the study did not consider the financial constraints that may prevent bus owners from complying with transport policies and regulations.
In conclusion, the findings of this study highlight the importance of effective transport policies and regulations for promoting sustainable transportation and reducing the negative impacts of transportation on the environment and public health. By implementing more effective transport policies and regulations, policymakers and stakeholders in the transportation sector can improve the efficiency and sustainability of transportation while reducing the negative impacts on the environment and public health.

Previous studies have also highlighted the importance of effective transport policies and regulations for reducing the negative impacts of unsustainable road use. For example, a study by Mokhtarian *et al.*, (2012), found that effective transport policies and regulations can lead to improved traffic flow, reduced air pollution, and increased safety for all road users. Similarly, a study by Azam *et al.*, (2016) found that effective regulations for public transport operators can lead to improved passenger safety and reduced traffic congestion.

V. CONCLUSION

The study concluded that inadequate transport policies and regulations were among the contributors to environmental pollution in Dar es Salaam. The data collected showed that there were insufficient policies and regulations in place to regulate the number of buses operating on the road, resulting in congestion, delays, and increased emissions. Furthermore, the study found that the lack of enforcement of existing policies and regulations, such as speed limits and emissions standards, further exacerbated the negative impacts of transportation on the environment and public health.

The study recommended that the government and regulatory bodies should enforce existing transport policies and introduce new ones to reduce environmental pollution caused by city buses drivers and other road users should be educated on sustainable road transport practices, and passengers should demand sustainable transport services.

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