The Role of Electric Standard Gauge Railway in Unlocking Economic Opportunities of Dodoma City Council, Tanzania

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ABSTRACT

The implementation of the modern electric Standard Gauge Railway (SGR) has faced criticism both domestically and internationally, with some labelling it a "white elephant" project. To assess the validity of these claims, this study explored the role of the modern electric SGR in unlocking economic opportunities in the central regions of Tanzania, specifically in Dodoma City. Guided by the Allocative Efficiency Theory (AET), which emphasizes the efficient use of resources to improve societal welfare, the study focused on the SGR's impact on agro-business development, employment creation, urbanization, and trade and economic integration. The research utilized a case study design, with the Dodoma City Council (DCC) as the focal point, involving 121 respondents selected through purposive sampling. Data were collected via questionnaires distributed to DCC officers and analyzed using descriptive statistics. The study revealed that the modern electric SGR, through its unique features of high-speed connectivity, eco-friendly technology, and increased freight capacity, has significantly contributed to unlocking economic opportunities in Dodoma. It was found to stimulate urbanization, enhance employment in various sectors, and foster regional trade and integration. The study concludes that the modern electric SGR is a key pillar in transforming Dodoma into an economic hub. To further enhance its role, the study recommends strengthening supporting industries and improving infrastructure, such as feeder roads, to maximize the SGR's economic impact.

Keywords: Africa, Electric Railway, Green Transport, Tanzania, Urbanization

I. INTRODUCTION

Public transportation is among of the areas which modern government invests as among of the means of speeding up development (Ganiyu & Wang, 2021). For the past decades there has been significant improvement in the infrastructures used in the transportation operation, the pace of technological innovation and ICT systems in the railway transportation has brought the modern technologies of running railway systems and trains (Wang & Sekei, 2021). The importance of railway transportation cannot be undermined; the evolution of railways from steam engines to electric-powered systems reflects the technological advancements aimed at enhancing speed, capacity, and environmental sustainability (Muya & Mganilwa, 2023).

Developed countries specifically in Europe, United States of America and Asia made the critical steps in the evolution of railway transportation. The first Train transportation was discovered in the United Kingdom (UK). The train used steam engines and steam-powered railways, such as the Stockton and Darlington Railway in 1825 and the Liverpool and Manchester Railway in 1830 (Ogden, 2009). Over time developed countries transformed their railway transportation operations to the modern railway technologies capable of accommodating the pace of demand in the railway transportation sector as the means of boosting up the economic growth (Chege et al., 2019).

Being among of the factors for unlocking economic opportunities European and Asian countries introduced advanced high-speed rail networks such as the French TGV (Train à Grande Vitesse) and Germany's ICE (Intercity-Express). In the late 1990s U.S. introduced diesel-electric locomotives, which improved efficiency and reduced operational costs. Asian countries are also for their ability of coping with the technological changes and coming up

with the modern technologies in different sectors (Achour, 2016). Japan's introduction of the Shinkansen (bullet train) in 1964 set the benchmark for speed and efficiency while her main competitor in the Asian economy China become the world's largest operator of high-speed rail along with South Korea (Zou et al., 2021).

African countries also made the significant improvement in the railways systems and Train technologies as the means of boosting economic growth beyond their regional boundaries (Bouraima et al., 2023). The pace of economic development and the demand for quality transportation sector forced African nations to hugely invest in the modern transportation innovation capable of connecting landlocked countries to seaports and fostering inter-regional trade (Zhu & Dossani, 2020). Historically majority of the railway's lines were inherited from the colonial masters, during the post-colonial era majority of the African countries hugely relied on the inherited traditional railways systems which failed to meet the demand of the modern economy (Ganiyu & Yu, 2020).

In the late 1990s and the early 2000s African countries started to shift to the modern railways systems capable of accommodating the global economic and technological demands. By the early 2000s, Egypt began upgrading its rail network to include electric-powered lines to improve economy efficiency and environmental sustainability (Nkunda, 2023). Morrocco was also among of the North African countries made significant steps in developing the railway systems (Githaiga & Bing, 2019). The country induced the modern electronic train her railways system in 2008 particularly with the launch of its high-speed electric rail, the Al-Boraq which connects Tangier and Casablanca, significantly reducing travel time and promoting regional economic growth (Lungomesha & Zulu, 2019).

In the Southern Saharan countries, South Africa was the first country to adopt the electric railways systems. to improve efficiency and sustainability. The Gautrain, launched in 2010, is a prime example of South Africa's modernization efforts. Kenya, Tanzania and Uganda made the significant steps of improving the railways systems as the means of unlocking economic opportunities with the nations and the neighbouring nations. Despite the significant improvement in their railways system, before 2020 none of the East African countries were yet to use electric railways systems. Despite making early innovations in the railway transportation, in 2017 Kenya introduced the normal Standard Gauge Railway (SGR) which does not accommodate electric trains (Githaiga, 2024).

Tanzania's railways system has the long history from the colonial period of the Germany who built the Central Line in the early 1900s and the for decades the central line railway system has been serving as the major connector of the coastal regions and the central regions of the country. In the mid-1970s Tanzania and Zambia with the support from China achieved to build the railway which connects Dar es Salaam to Kapiri Mposhi in Zambia. In the 2017 Tanzania started to build the Standard Gauge Railway (SGR) as the major step of modernizing the country's transportation sector and unlocking the regional economic opportunities linking the Dar es Salaam as the country's economic hub with the Central and the Lake zone Regions (Nkunda, 2023).

Tanzanian government aimed at supporting the outdated Central Line with a state-of-the-art railway system which designed to accommodate electric trains making it the first SGR railway system capable of accommodating electric trains. Built in phases due to the construction costs and the hardship of obtaining construction funds, The first phase of the project, connecting Dar es Salaam to Morogoro and the second phase connecting Morogoro and Dodoma which is Capital City of Tanzania have already been accomplished making the travel duration between Dar es Salaam and Dodoma through train less than 4 hours. Facilitating faster and more cost-effective transportation of goods, the introduction of the SGR Electric is expected to transform Tanzania's economic landscape (Muya & Mganilwa, 2023).

For the past few decades, the central regions of Tanzania have struggled to achieve significant economic growth. Several studies have highlighted the role of infrastructure development in fostering economic expansion in developing countries (World Bank, 2018; African Development Bank [AfDB], 2019). In response to these challenges, during the late 1990s and early 2000s, the Government of Tanzania (GoT) made substantial investments in infrastructure, particularly in road networks, to enhance regional connectivity (Kahyarara, 2020). A key initiative was the establishment of TANROADS (Tanzania National Roads Agency) in 2000, which played a crucial role in linking various regions and facilitating economic activities, particularly in landlocked areas (Massawe, 2021). Previous studies have indicated that improved road networks contribute significantly to regional trade and economic growth (Estache & Wren-Lewis, 2016), supporting the rationale behind these investments.

In the mid-2010s, the GoT further strengthened Tanzania's transportation infrastructure by improving the Central Railway Network, connecting Dar es Salaam with the Western Zone Regions via Dodoma. Research has shown that efficient railway systems reduce transportation costs, enhance trade efficiency, and promote industrial growth (Banister & Berechman, 2001; Gwilliam, 2011). The improvement of the Central Railway Network was intended to provide a reliable and cost-effective alternative to road transport, thereby fostering economic development (Mrema, 2020). However, some scholars argue that while railway investments enhance connectivity, their long-term sustainability depends on proper management and integration with other modes of transport (Nguyen-Phuoc et al., 2017).

Despite these significant investments, the government recognized the need for a modern railway system to better connect landlocked regions with coastal areas, which serve as major hubs for import and export activities. To address this, Tanzania embarked on a record-breaking investment of over $7.6 billion USD to develop the Standard Gauge Railway (SGR), designed to support electric trains. However, the project faced criticism both locally and internationally, with concerns about its economic viability, financing mechanisms, and overall sustainability (Mwakanemela & Kessy, 2022). Critics questioned whether the projected benefits would justify the substantial financial commitment, a debate that aligns with broader discussions in infrastructure economics regarding the long-term impact of large-scale transport investments (Flyvbjerg, 2009).

Several studies have examined the economic impact of transport infrastructure in Tanzania, particularly road and railway investments. For instance, studies by Kessy and Massawe (2020) analyzed the role of road networks in promoting regional trade, while Mrema (2021) investigated the effects of railway connectivity on industrial development. Additionally, research by Ndulu and O'Connell (2019) highlighted the challenges of financing large-scale transport projects in Tanzania and their implications for economic growth. However, existing studies have primarily focused on historical transport investments, with limited empirical analyses of the modern electric SGR and its direct economic contributions to the central regions (Kahyarara, 2020; Mwakanemela & Kessy, 2022). This study builds on previous research to justify the projected benefits of the SGR and provide an evidence-based analysis of its economic significance.

1.1 Statement of the Problem

Infrastructure development is a critical driver of economic growth, facilitating trade, industrialization, and regional integration. Efficient transport networks enhance productivity by reducing the cost of moving goods and people, thereby improving market access and business competitiveness (World Bank, 2021; AfDB, 2020). In many developing economies, investments in road and railway infrastructure have played a transformative role in unlocking economic potential, particularly in landlocked regions where access to major markets remains limited (Gwilliam, 2011; Zou et al., 2021). Recognizing this, the Government of Tanzania (GoT) has undertaken significant infrastructure projects aimed at improving connectivity between regions. Among these, the modern electric Standard Gauge Railway (SGR) stands out as a major investment aimed at enhancing transportation efficiency and fostering economic development, particularly in central regions such as Dodoma (Mwakanemela & Kessy, 2022).

Despite these efforts, Tanzania continues to face infrastructure-related challenges that hinder economic growth, including high transport costs, inadequate railway capacity, and limited integration between road and rail networks (Mrema, 2021; Ndulu & O'Connell, 2019). While studies have examined the impact of transport infrastructure investments on economic development (Kahyarara, 2020; Kessy & Massawe, 2020), there is limited empirical research on the specific role of the modern electric SGR in unlocking economic opportunities in the central regions. This study aims to address this gap by assessing the economic contributions of the modern electric SGR, particularly in facilitating trade, improving industrialization, and enhancing market accessibility in Tanzania's central regions. By providing an evidence-based analysis, the study will contribute to ongoing discussions on infrastructure investment effectiveness and inform future transport development policies in Tanzania.

1.2 Research Objectives

The study aimed at analysing the role of the modern electric SGR in unlocking the economic opportunities in Dodoma City Council (DCC). The study specifically focused on

i. Determining impact of the modern electric SGR on the development of agro-business in DCC.
ii. Evaluating the employment opportunities generated by the construction and operation of the SGR in DCC.
iii. Examine the role of the SGR in driving urbanization and infrastructure growth in DCC.
iv. Explore the effect of the SGR on regional trade and economic integration in the DCC

II. LITERATURE REVIEW

2.1 Theoretical Review

The study employed the Allocative Efficiency Theory (AET), Allocative efficiency refers to the state of economy in which the production design process and allocation of resources is aligned with the preferences of the consumers. Allocation of facilities should be designed with the aim of maximizing the welfare of the society (Tutulmaz, 2014). Allocative Efficiency Theory (AET) insist on the need of ensuring that resources are used so that their marginal benefit to society is equal to their marginal cost. The theory insists that for the aim of achieving the strategic objective of the project, the project must be well designed in terms of facilities and conditions to meet the expectation of the final consumers. The theory cements on the maximizing the total society welfare by ensuring that

goods and services are produced in the quantities and at the prices that reflect consumer preferences (Kryukov & Lyubchenko, 2022).

In the context of the modern electric SGR, Allocative Efficiency Theory is accurately relevant in determining how the improved transportation network through modern SGR network can reduce inefficiencies in the movement of goods, especially agricultural products, between regions. The ability of the modern electric SGR in facilitating faster and more cost-effective transportation, the SGR helps businesses in the central regions specifically Dodoma reaching broader markets, both domestically and internationally through the importation and exportation activities via the Port of Dar es Salaam (World Bank, 2021). Investing in the modern electric SGR helps in facilitating the more efficient allocation of resources such as labour, capital, and raw materials, ensuring they are used in the most productive sectors like industrialization and agro-business (Krugman et al., 2018).

Allocative Efficiency Theory (AET) indicates that resources are always scarce, thus there is the need of effectively setting policies and regulations which oversees the allocation of resources in the areas which they are hugely demanded. Tanzanian economy is at the lower middle rank according to the international financial institutions, this indicates that investing the in the mega transportation projects like modern electric SGR must come after having the guarantee the project will lead to the positive economic, political and social benefits (International Monetary Fund [IMF], 2022). Despite significant needs in other critical areas, such as healthcare and education, the Government of Tanzania (GoT) allocated substantial funds to the modern electric SGR project due to its perceived long-term economic benefits (AfDB, 2020). Studies on transport infrastructure investment in developing economies have emphasized the importance of ensuring such investments yield tangible economic returns and do not divert resources from essential public services (Estache & Wren-Lewis, 2016)

Investing in the modern electric SGR is also analyzed through the lens of Opportunity Cost Theory, which highlights the economic principle of foregone alternatives when a decision is made to allocate resources to one option over another (Drucker, 2001). By prioritizing the construction of the modern electric SGR, the GoT effectively sacrificed alternative investments that could have addressed pressing national needs (Frank & Bernanke, 2019). However, the government justified this decision based on the projected economic opportunities that the SGR would unlock, particularly in Tanzania's central regions (Mwakanemela & Kessy, 2022). This raises the necessity of further exploring the role of the modern electric SGR in stimulating economic growth and regional development.

2.2 Empirical Review

The number of previous scholars has indicated the role of infrastructure in unlocking the economic opportunities in different areas, Akhsan and Mukhsin (2019) on the study concerning the role of metro-train in enhancing the tourism sector development of Egypt, the study discovered metro systems provided an efficient and affordable means of transportation for both domestic and international tourists eventually unlocking the economic opportunities (Akhsan & Mukhsin, 2019). Findings obtained by Akhsan and Mukhsin (2019) correlates by the conclusion raised by Abdinoor and Waleed (2023) on the study concerning the role played by the metro-station in facilitating the successfulness of Qatar World Cup Campaign 2022. Abdinoor and Waleed (2023) argued that an integrated metro network reduced congestion in urban centers during world cup campaign, promoted eco-friendly travel, and encourages sustainable sport tourism practices (Abdinoor & Waleed, 2023).

Trepáčová and Kureckova (2020) conducted the study on the advantages and disadvantages of rail transportation as perceived by passengers in Czech Republic, the scholar employed the qualitative and quantitative study design and discovered that rail way transportation enable the country to unlock the economic opportunities by smoothening exportation of domestic good in the international market. Trepáčová and Kureckova (2020) further indicated that investing in the rail transportation services is connected with the number of risks such as environmental pollution and misuse of public funds, thus the railway projects should be taken with precaution. The challenge of high costs incurred by government in investing in the railway transportation project was also highlighted by Mohapatra (2016) who conducted the study on directions of innovative development of railway transport. The study found out that the substantial financial resources required for constructing, modernizing, and maintaining railway infrastructure often strain public budgets.

On the other hand, Al-tony and Lashine (2020) conducted the study on cost-benefit analysis of railway electrification employing the case study of Cairo-Alexandria railway line. The study found out that there are the significant economic benefits of electrifying the railway line including reduced fuel costs, lower maintenance expenses for diesel engines, as well as improved operational efficiency. Despite the advantages of railway electrification, there are also some limitations which need to be properly managed such as high initial capital investment as well as maintenance and operational costs. On the other hand, the study Mohapatra (2016) on the cost benefit analysis of electric railway transportation between Ethiopia and Djibouti cemented that the electrification of

railway network apart from enhancing the diplomatic relationship between Ethiopia and Djibouti it has also led to significant increase of export trade and foreign currency for both two countries.

Muya and Mganilwa (2023) conducted the study on the benefits of Tanzania's Standard Gauge Railway (SGR) flagship project focusing on the marketing mix perspective, the study employed the interview data collection tool and discovered that the SGR project will significantly enhance Tanzania's transportation sector by providing a faster, safer, and more reliable mode of transport for goods and passengers. The study further indicated that there is the need for the management of Tanzania Railway Corporation (TRC) to properly align the SGR services and the overall marketing and strategic business operation of the company. To enhance the profitability and the benefits of the project, the company must prepare the marketing plans, communication strategies as well as quality relationship with the community.

On the other hand, Nkunda (2023) conducted the study on the impact of Standard Gauge Railway (SGR) project on the Tanzania economy amidst the project completion. The study employed the qualitative research design and secondary data collection through reviewing different documents such as documents article concerning the implementation of SGR project. The paper found that the SGR project has a lot of positive impacts including stimulation of Industrialization; efficient and fast movement of cargo; source of foreign currency; Development of rural area; business growth; Creating good relationship between neighbour countries; and employment opportunities. The study recommended that the responsible authority should hire professionals capable of running the projects for the aim of enhancing the level of project sustainability and viability of the project goals.

III. METHODOLOGY

For the aim of enhancing the ability of the study to attain the strategic goals, the study employed research methodologies which matched the strategic objective of the study.

3.1 Research Design

The study employed the case study research design, using the Dodoma City Council (DCC) as the case study. Adoption of the case study design enabled the scholar to conduct an in-depth exploration of the specific roles of the modern electric SGR in unlocking the economic opportunities within the DCC context, providing detailed insights that may be generalized to similar settings. Adopting the case study research design the researcher became in the best position of obtaining respondents with good understanding regarding the operations of SGR railway and the electric train in speeding up the economy

3.2 Research Approach

For the aim of enhancing the ability of the study to obtain the wide scope of data, the research employed the mixed research approach involving the adoption of both qualitative and quantitative research approaches guiding the study. Through the mixed research approach, the study achieved a comprehensive understanding of the role of SGR in unlocking the economic opportunities in the central regions. The qualitative approach provided in-depth insights into complex issues, while the quantitative approach facilitated the collection of measurable and statistically analysable data.

3.3 Sample size and Sampling Techniques

Sampling refers to the procedures which are used by the researcher in obtaining the respondents who are qualified to be involved in the study. The study employed a purposive sampling technique. Purposive sampling refers to sampling techniques in which the sample is selected based on its characteristics such as the level of knowledge and the objectivity of the study (Kothari, 2004). The technique was applied with the aim of obtaining respondents with a good understanding on the concept of electric SGR in facilitating economic development. The study employed the sample size of 121 respondents obtained through the purposive sampling technique.

3.4 Data Collection and Analysis

The study employed questionnaires as the main data collection tools. Questionnaires were designed were designed to gather both qualitative and quantitative data from the DCC officers, enabling the researcher to analyze patterns, trends, and in-depth insights related to the SGR's contributions to economic development and the relationship between SGR and accessibility of economic opportunities in the central regions. Descriptive analysis was employed to pattern the findings of the study through frequencies and percentage followed by the regression analysis which was used in establishing the relationship between the study variables.

3.5 Variable Relationship

In enhancing the validity and reliability of the study, the scholar separated the study int two variables of the dependent and independent variables. An independent variable was carried by the role of the modern electric SGR; this variable encompasses various aspects, such as the efficiency, connectivity, and capacity of the SGR to facilitate transportation. On the other hand, the dependent variable of the study was unlocking the economic opportunities. The dependent variable entailed development of agro-business in DCC, employment opportunities in DCC, urbanization and infrastructure growth in DCC and trade and economic integration in the DCC.

Table 1

Variable Relationship

Variable type	Variable Name	Description
Independent Variable	Role of the modern electric SGR	Modern electric SGR guarantees efficiency, connectivity, and capacity of the SGR to facilitate transportation and support economic activities.
Dependent Variable	Unlocking economic opportunities	Development of agro-business in DCC: Expansion and improvement of agricultural businesses and value chains
		Employment opportunities in DCC: Creation of jobs resulting from the SGR operations and related economic activities.
		Urbanization and infrastructure growth in DCC: Enhanced urban development and infrastructure upgrades driven by improved connectivity.
		Trade and economic integration in DCC**:** Increased trade volumes and stronger economic links between regions facilitated by the SGR.

IV. FINDINGS & DISCUSSION

This section indicates the findings from the field regarding the roles of role of the modern electric SGR in unlocking economic opportunities of the central regions using DCC as the case study. The section focuses on indicating the unique features of the modern electric SGR in unlocking the economic opportunities. The study further indicates the role of electric SGR in unlocking economic opportunities through development of agro-business in DCC, employment opportunities in DCC, urbanization and infrastructure growth in DCC and trade and economic integration in DCC.

4.1 The employment opportunities generated by the construction and operation of the SGR in DCC

The results in Figure 1 show that the majority of respondents (38.09%) believe the modern electric SGR's high-speed connectivity is crucial for economic development. Additionally, 28.57% highlighted its advantage of increased freight capacity. Another 19.04% emphasized its use of eco-friendly technology, which supports sustainable growth. Meanwhile, 9.52% recognized its role in job creation and skill development. The remaining 4.76% noted its contribution to enhancing regional integration. Overall, the findings suggest that the modern electric SGR offers multiple economic and environmental benefits. These advantages make it a valuable investment for long-term development.

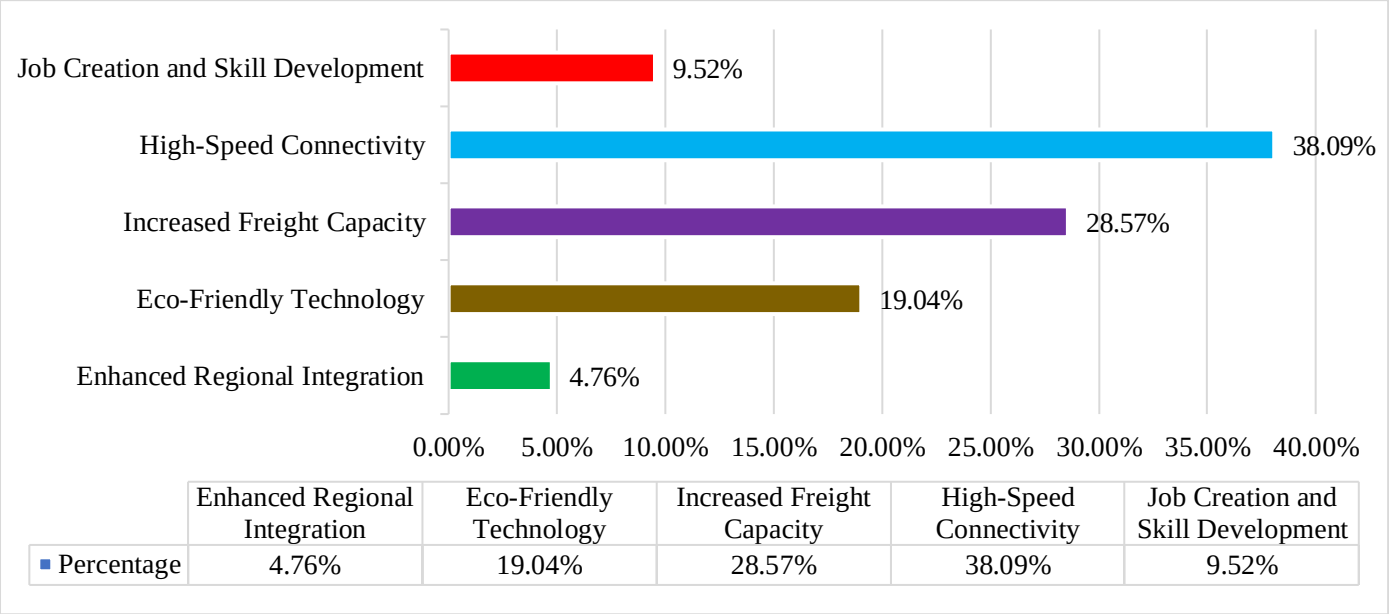

Figure 1
The Unique Features of the Modern Electric SGR in Unlocking the Economic Opportunities

4.2 The role of the SGR in driving urbanization and infrastructure growth in DCC.

The results in Figure 2 indicate that the majority of respondents (33.33%) believe the modern electric SGR facilitates agribusiness in Dodoma by enabling the efficient transportation of agricultural products. Additionally, 23.80% highlighted its role in expanding market access, while 19.04% mentioned its contribution to reducing operational costs in agricultural activities. Meanwhile, 9.52% stated that the modern electric SGR plays a significant role in supporting agro-processing industries. Another 14.28% recognized its importance in facilitating agro-product export opportunities. Overall, the findings suggest that the modern electric SGR greatly benefits the agricultural sector. Its impact extends to transportation, market expansion, cost reduction, and industrial support

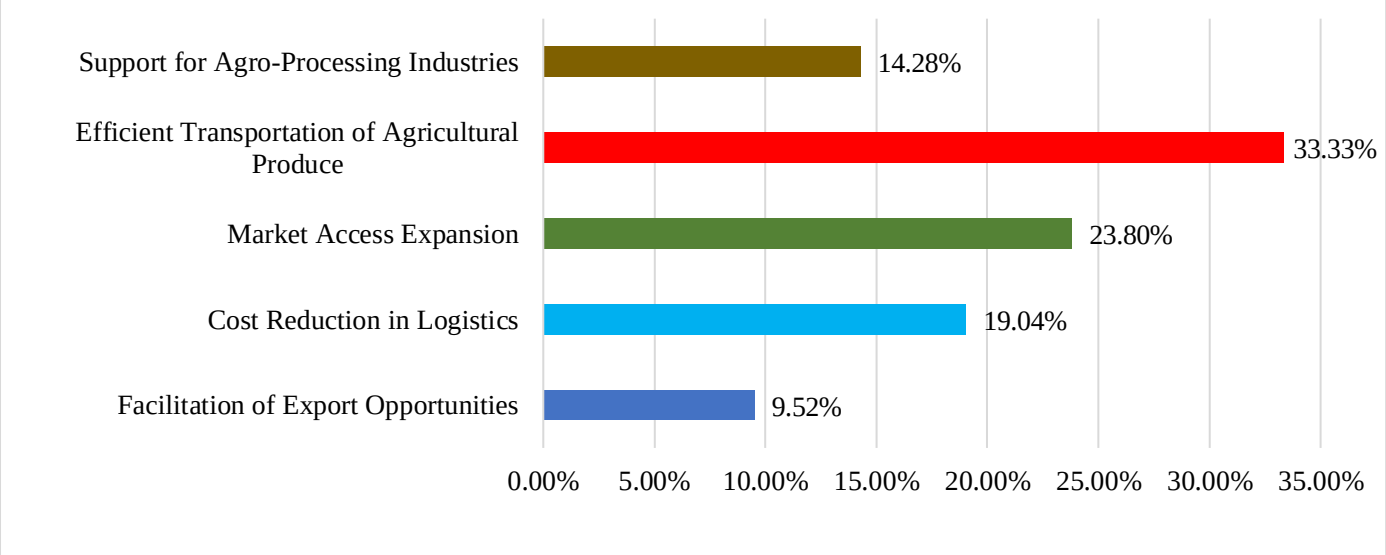

Figure 2
Role of Modern Electric SGR in Unlocking the Agro-Business Opportunities in Dodoma City

The results in Figure 3 indicate that the majority of respondents (38.09%) believe the modern electric SGR has facilitated direct employment during construction and operations. Additionally, 28.57% stated that it has created job opportunities by supporting the expansion of industries such as financial institutions. Meanwhile, 19.04% highlighted its role in increasing employment in the agriculture sector. Another 9.52% mentioned that the modern electric SGR has contributed to urban development and the associated job market. The remaining 4.76% recognized its impact on facilitating trade-related jobs and entrepreneurship. Overall, the findings suggest that the modern electric

SGR plays a crucial role in job creation across various sectors. Its influence extends from direct employment to supporting industries and economic growth.

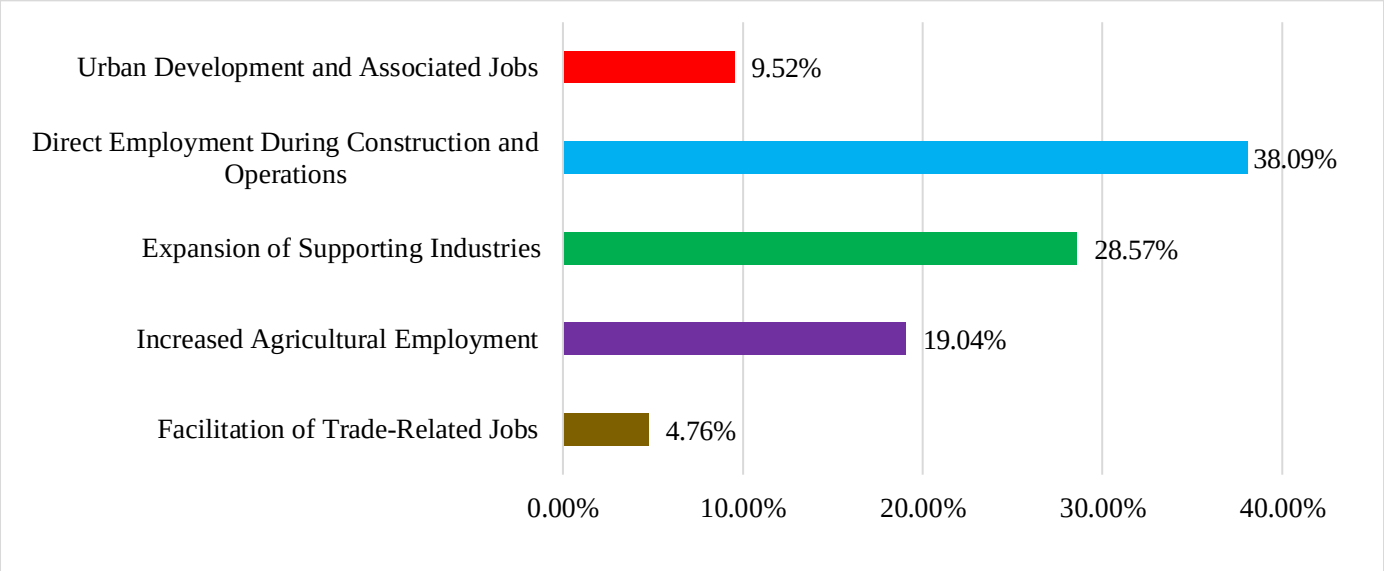

Figure 3
Role of Modern Electric SGR in Unlocking the Employment Opportunities in Dodoma

Results in Figure 4 show that the modern electric SGR plays a significant role in unlocking urbanization opportunities in Dodoma City by enhancing connectivity and accessibility, as cited by 33.33% of respondents. Additionally, 23.80% highlighted its contribution to infrastructure expansion, emphasizing the development of essential facilities in the city. Meanwhile, 19.04% recognized its role in attracting investments, further driving urban growth. Another 14.28% mentioned its impact on the growth of urban services and amenities, which enhances the quality of life. Lastly, 9.52% emphasized the importance of improved connectivity in linking Dodoma to other regions. Overall, the findings suggest that the modern electric SGR significantly contributes to urbanization. Its impact extends from infrastructure development and investment attraction to better accessibility and enhanced urban services.

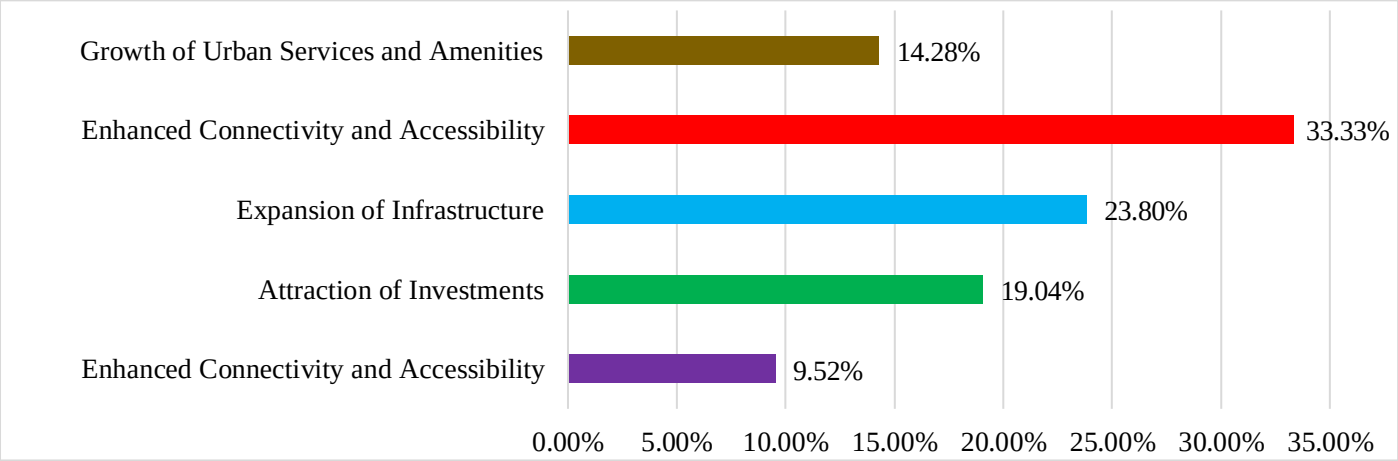

Figure 4
The role of modern electric SGR in unlocking the economic opportunity urbanization in Dodoma City

4.3 The effect of the SGR on regional trade and economic integration in the DCC

The results in Figure 5 indicate that the modern electric SGR has played a significant role in facilitating regional trade, as highlighted by 33.33% of respondents. This underscores its ability to connect Dodoma with major trade routes and markets, driving regional economic growth. Additionally, 28.57% of respondents recognized its impact in reducing transportation costs, making trade more efficient. Meanwhile, 19.04% emphasized its role in promoting cross-border collaboration, fostering partnerships and joint ventures between local and international traders. Another 14.28% highlighted its contribution to enhancing market access, further integrating businesses into larger

trade networks. Lastly, 4.76% of respondents acknowledged its role in stimulating export growth, reinforcing its contribution to integrating Dodoma into global supply chains. Overall, these findings suggest that the modern electric SGR is a key driver of economic connectivity, cost efficiency, and international trade expansion.

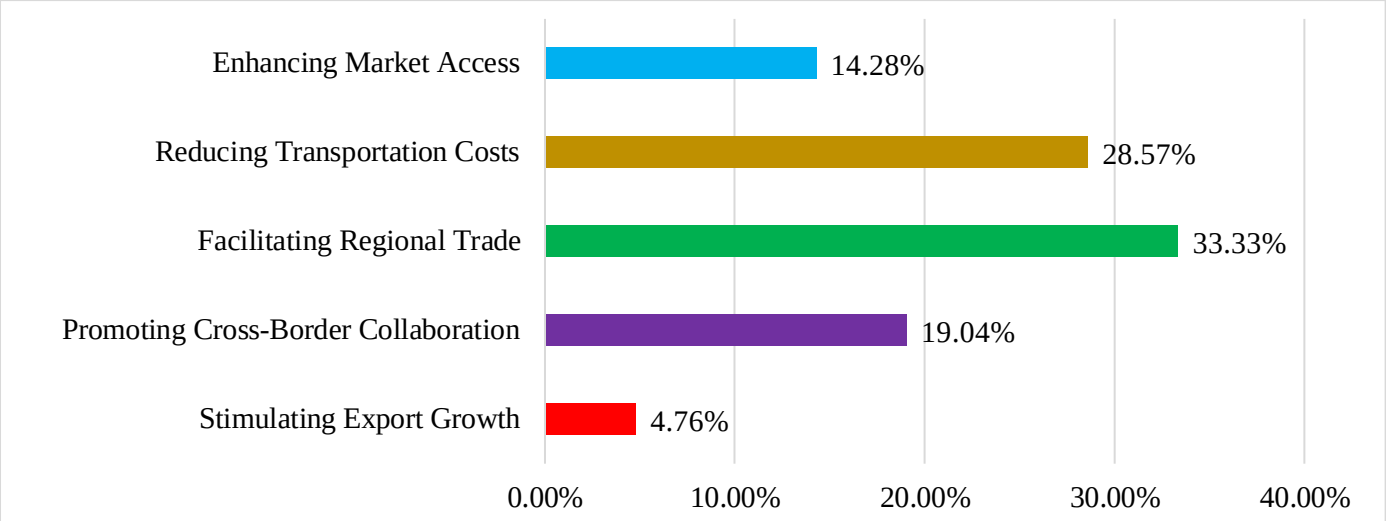

Figure 5
The role of Modern Electric SGR in Unlocking the Economic Opportunity of Trade and Economic Integration in Dodoma City

4.4 Discussion

The findings from the field indicate that the modern electric SGR possesses unique features capable of unlocking economic opportunities in Dodoma City. The results underscore its transformative potential in driving economic growth across multiple sectors in Dodoma and the central regions at large. One of the most significant attributes of the modern electric SGR is its high-speed connectivity, which enables the rapid and reliable transportation of goods and passengers. This efficiency is crucial for economic development, as it facilitates market access and accelerates urbanization. These findings align with Trepáčová and Kureckova (2020), who argue that advanced transportation systems serve as economic catalysts by linking urban areas to regional and international markets, thus fostering economic expansion.

Additionally, the results highlight the modern electric SGR's role in enhancing passenger movement between Dar es Salaam and Dodoma. The increased freight capacity of the SGR further strengthens Dodoma's position as a strategic trade and logistics hub by enabling the efficient transportation of larger volumes of goods. These transportation advancements contribute to regional integration, a view supported by Akhsan and Mukhsin (2019), who emphasize that modern transport networks—characterized by global innovations enhance economic interdependence among regions, thereby unlocking new economic opportunities.

The study also reveals that the modern electric SGR plays a crucial role in boosting agribusiness in the central regions, particularly in Dodoma. Its ability to facilitate efficient transportation, reduce operational costs, and expand market access significantly benefits agricultural producers. These findings are consistent with Lungomesha and Zulu (2019), who emphasize that efficient transport systems reduce post-harvest losses, improve profitability for farmers, and enhance their competitive advantage in the agricultural industry. Furthermore, the introduction of the modern electric SGR has provided critical support for agro-processing industries, both small and large, strengthening the agricultural value chain by attracting investment in value addition and promoting economic resilience.

The link between modern infrastructure and agricultural growth has been widely discussed in previous research. Al-Tony and Lashine (2020) assert that the availability of reliable infrastructure is a key driver of rural development, particularly by improving agricultural productivity and market access. The growth of the agricultural sector, which remains a major source of income in rural areas, is highly dependent on dependable infrastructure. The study's findings further reinforce this argument by demonstrating how the modern electric SGR supports agro-processing industries, ultimately enhancing value chains and fostering economic sustainability.

Another key finding is the impact of the modern electric SGR on employment creation. The implementation of the SGR project in Dodoma has directly provided numerous job opportunities, particularly during its construction and operational phases. Additionally, the presence of the SGR has stimulated the growth of industries and businesses

that collaborate with project contractors, further expanding employment opportunities in Dodoma and other central regions. These findings align with Chege et al. (2019), who argue that infrastructure projects serve as major drivers of job creation by generating direct employment and fostering the growth of auxiliary industries. Moreover, beyond direct employment, the SGR project has also facilitated indirect employment, particularly through entrepreneurship and small business development, following its implementation.

The study also highlights how the modern electric SGR has stimulated urbanization in central regions, particularly in Dodoma. The ongoing transition of government operations from Dar es Salaam to Dodoma has been significantly supported by the improved connectivity provided by the SGR. The study findings indicate that urbanization in Dodoma City has been largely influenced by enhanced transport networks, which have attracted investments and supported infrastructure development. The introduction of the modern electric SGR has strengthened connectivity between Dodoma and Dar es Salaam while simultaneously attracting investments and promoting the expansion of supporting infrastructure, such as feeder roads and metro stations. These findings are supported by Wang and Sekei (2021), who emphasize that transport infrastructure acts as a magnet for both domestic and foreign investments in urban areas. Regions with high-quality transport infrastructure are more likely to experience rapid urbanization, attract businesses, and develop essential services such as hotels and hospitals, thereby improving overall economic growth.

Finally, the findings indicate that the modern electric SGR has become a key driver of trade and economic integration, both within Dodoma and in neighboring regions. Since the commencement of its operations, the SGR has significantly facilitated regional trade by improving market access, reducing transportation costs, and promoting economic connectivity. These factors are essential for stimulating economic growth. The study's findings align with Kryukov and Lyubchenko (2022), who argue that modern rail systems lower logistical barriers, allowing businesses to participate more actively in regional and global markets. Additionally, Githaiga (2024) supports this perspective, emphasizing the role of transport systems in international trade expansion. The study highlights the importance of using environmentally friendly infrastructure systems, such as the modern electric SGR, to promote sustainable trade and economic growth while minimizing environmental impact.

Therefore, the modern electric SGR has proven to be a transformative infrastructure project with far-reaching economic benefits for Dodoma and the central regions. Its contributions span across multiple sectors, including trade, agriculture, employment, urbanization, and regional integration. By enhancing connectivity, reducing costs, and attracting investments, the SGR serves as a key catalyst for long-term economic growth and sustainable development.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study has demonstrated that the implementation of the modern electric SGR has played a crucial role in unlocking economic opportunities and fostering economic development in the central regions, particularly in Dodoma City. With its unique features—including high-speed connectivity, increased freight capacity, and eco-friendly technology—the SGR has significantly contributed to achieving the city's strategic objectives. It has enhanced agribusiness by improving transportation efficiency for raw materials and facilitating the export of agro-products. Additionally, the modern electric SGR has spurred job creation across multiple sectors, including construction, operations, agriculture, and supporting industries. Furthermore, it has been instrumental in driving urbanization, fostering trade, and promoting economic integration, which has enhanced regional market access and strengthened cross-border collaboration.

5.2 Recommendations

To maximize the economic potential of the modern electric SGR, responsible authorities such as the Dodoma City Council (DCC) must implement targeted initiatives. Transforming Dodoma into a tourism and business hub is essential for attracting further investments. Authorities should collaborate with stakeholders to develop modern tourism facilities such as hotels, resorts, and cultural centers. Additionally, improving connectivity through the construction of feeder roads in collaboration with TANROADS and TARURA is crucial for linking rural areas to SGR stations. This will facilitate the smooth transportation of agricultural and industrial goods, enabling better integration into domestic and international markets. Moreover, fostering the growth of supporting industries—including construction, agriculture, hospitality, and financial services—will create a robust economic ecosystem, further amplifying the SGR's transformative impact on Dodoma's economic growth.

Despite the valuable insights gained, the study faced several limitations. Confidentiality concerns arose due to the government's ownership of the project, requiring the researcher to build trust with respondents by emphasizing the academic nature of the study and ensuring participant anonymity. Additionally, obtaining respondents with accurate

information was challenging, which was mitigated by employing a case study research design and purposive sampling techniques. Finally, the study was conducted within a limited timeframe of 28 days, restricting the exploration of long-term economic trends related to the SGR. To address this, the researcher narrowed the sample size and geographical scope to ensure the study's completion within the required timeframe.

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