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Assessing the Socio-Economic Impacts of Construction Infrastructure Performance on Community Development in Tanzania

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***Abstract*—** This study examines the effect of construction infrastructure on community development in Tanzania, taking Arusha, Dar es Salaam, Dodoma, Lindi, Morogooro, Mwanza, Pwani, Shinyanga, Singida, and Tabora regions as our case study. The research project employed the descriptive research method to track the impact of construction infrastructure in the above-mentioned regions. The sampling methods that were conducted in this study are simple random sampling and purposive sampling. The data were imported into IBM's Statistical Package for the Social Sciences (SPSS) software (version 25.0). Data analysis in this study primarily employed descriptive statistics such as frequency and percentage. Pearson correlation and multiple regression were also used. Based on study findings, the researcher found that the relationship between construction infrastructure and community development was statistically significant at 0.05. It can be deduced that effective construction projects brings about job creation during construction, increase in local spending, extension of infrastructures, potential for economic diversification, upgraded roads, improvement in public transportation & other utilities, improved access to health care, improved education facilities, government expenditure, improvement in technology, improvement in essential services, and social cohesion. The study recommends that the Central Government and Local Governments of Tanzania should continue developing various construction projects in order to stimulate the economy at the household and national levels. Also, people living around the areas where the projects are located are advised to take advantage of these construction opportunities so that they can improve their living conditions and standards.

***Keywords*—** Construction Infrastructure; Community Development; Economic Development, Access to Services, Community Revitalization.

I. INTRODUCTION

The construction industry which include road, railways, dams, and others contributes significantly in terms of scale and participation in the development process for both developed and developing countries. Construction products provide essential public infrastructure and private structures for many productive activities such as services, trade, utilities and other industries. The industry is not only important for its finished product, but also employs a large number of people (directly and indirectly) and therefore has a positive impact on the economy of the country/region during the actual construction process.

A construction project can have a positive impact on the economic development of the country. It can also positively impact the community in which it takes place. The economic and social value of a properly implemented construction project should not be underestimated. Construction can play a significant role in boosting the economic growth and development of a given area. It can increase employment in the area and revitalize the local economy. The overall economic and social well-being of a given area can depend on successful construction projects. However, Foster, Gorgulu, Straub, and Vagliasindi (2023) posit that it is challenging to measure the causal relationship between infrastructure and economic development.

Additionally, it has been argued by development economists that physical infrastructure is a precondition for industrialization, hence improvement in economic development of a country (Sawada, 2015). It has been stated by Murphy, Shleifer, and Vishny (1989) that generally physical infrastructure consists of economic infrastructure and social infrastructure. Economic infrastructure comprises of telecommunications, roads, irrigation, and electricity whereas social infrastructure comprises of water supply, sewage systems, hospitals, and school facilities.

The construction industry is complex in nature because it comprises a large number of stakeholders such as customers, contractors, professionals, investors, and management. Despite this complexity, the sector plays an important role in the development and success of

general public goals. It remains as one of the large contributors to economy contributing as much as 10% in Gross Domestic Product (GNP) in developed countries (Oke, Ogungbile, Oyewobi, & Tengan, 2016).

Road construction projects have a significant impact on rural areas as they are represented by their construction. A study by Kaare (2016) showed that road construction projects can be seen as significant improvements for private businesses. This is because the improvement of road transport results in high efficiency, easy and reliable transport, better connectivity of business facilities, and better efficiency. These achievements are still expected to be great because they are the main means of improving the roads. It is also suggested that on the other hand, the goal of road development and other means should focus on the relationship between mobility and other social goals. Policies that encourage the construction of roads and other infrastructure to be more important to the public because they are directly related to public use.

Construction projects in the East African Community (EAC) are a driving force for social development and local economic growth. Construction projects benefit residents and businesses by creating jobs, improving infrastructure, and increasing property values. However, to ensure long-term success, it is important to balance development with the needs of the community.

Tanzania has embarked upon large and medium-sized construction projects in recent years. A notable major construction projects include the Standard Gauge Railway (SGR), the Julius Nyerere Hydropower Project, an oil pipeline from Hoima, Uganda to Tanga, Tanzania, improvement and construction of new infrastructures in transportation, telecommunications, energy, and water and sanitation sectors, and improvements to Tanzania Airlines (ATCL). The purpose of this study is to evaluate the impact of investment in various infrastructure sectors on community development in Tanzania. The researcher used a panel data covering 500 samples from 2005 to 2024.

For almost two decades now, the Tanzanian government has been building various infrastructures, including roads, airports, bridges, dams, modern railways, airports, etc. But the speed of construction increased during the fifth phase under the late President John Magufuli. All these projects were expected to raise the standard of living of the people where they were being built. Despite these expectations, some citizens and politicians have been claiming that the projects have not had a positive impact on the citizens. Thus, this study was conducted to satisfy oneself if the construction projects have brought positive results to the citizens or not.

II. LITERATURE REVIEW

Poor construction performance is one of the main factors that reduce efficiency in construction industry in various countries, especially in developing ones. Most of the construction projects implemented in those countries face a range of simple to complex constraints. A study by Oke, Ogungbile, Oyewobi, and Tengan (2016) investigating factors affecting the performance of construction projects and their effects on the economy development of Nigeria, found that the most important factors affecting the performance of the project are the cost of the project structure, the project complexity, unavailability of resources, quality of materials and raw materials. In addition, the study showed that completion time of the projects, and customer/client were the main indicators of project performance. Moreover, it was found that the improvement of technology and expansion of infrastructures were found to be important indicators of economic development.

Construction projects in developing countries face many challenges and difficulties and this ultimately has an impact on the economic development of the country. Research conducted by Olusola, Emmanuel, Omoregie, Seidu, & Adeyem (2016) has discovered that the main factors affecting project performance include the cost of the project structure, unavailability of resources, late payment of contractors, quality of materials and raw materials and lack of construction manpower. Also the results show that the areas where project performance has the most impact on economic development are; technological improvement, expansion of connectivity, application of employment opportunities and government spending.

Road infrastructure is considered one of the basic factors to achieve economic growth in the country. It is driven by connecting people employment, facilitating the delivery of products, and promotion exchange between different people. In sub-Saharan Africa, road infrastructure has a significant impact on communities living in protected areas. A study conducted by Ndyalusa and Kitula (2023) in Ngorongoro Conservation Area Authority in Tanzania concluded that road construction projects have significant influence on both social and economic performance

because the study reveals that when the government invests on road construction infrastructure, it improves the social performance and at the same time it improves the economic performance. Similarly, this study concluded that there is a positive relationship between social performance and economic performance as far as road construction projects are concerned. Finally, the study shows that social performance can also mediate the relationships between road construction and economic performance. Thus, when the road infrastructure exists, it enhances the social improvement in the community through strengthening the business opportunities, enlarging the market for the community which attracts more business investors to invest on different angles that equally improve the economic performance of the community.

Construction projects are associated with both positive and negative effects to the community and environment. Also, construction projects are accompanied by harmful effects on people and animals near the construction site. For example, road, railway and dam construction activities are accompanied by dust emissions that affect people's health. The study results by Vajjalla, Koehn, and Kumar (2022) negative effects of construction include increased water pollution, noise pollution, and air pollution; loss of vegetation, land contamination during earthwork excavations; and the increased travel time for the people in the community to reach their destination.

Similarly, a study by Sackey, et al. (2023) showed that road construction has adversely affected the health of the residents of Lake Atonsu but it indicated that there was a decline in the number of cases recorded in hospitals due to the restrictions associated with COVID-19 and its accompanying stigma, which prevented people from reporting to the hospital. Thus, the authors emphasize the need to keep the results in mind and the implementation of phase by phase of road construction in order to reduce negative effect associated with the construction process.

Conceptual model

From the above review of literature, our study developed dependent variable and independent variable for our study, and hence developing Conceptual model as depicted in Figure I.

For the study purpose, dependent variable is community development (i.e. economic development, infrastructure improvement, access to services, and community revitalization) while independent variable includes construction infrastructure.

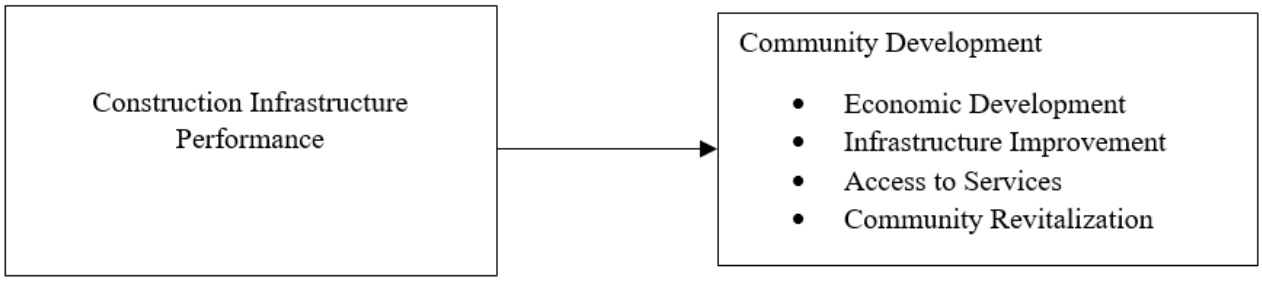

Figure I: *Conceptual model*
Source: Based on Researcher's conceptualization

Research Hypotheses

Based on the above conceptual model, we formulated the following hypotheses for our study:

- H1: Infrastructure construction projects has no positive influence on economic development
- H2: Infrastructure construction projects has no positive influence on infrastructure improvement
- H3: Infrastructure construction projects has no positive influence on access to services
- H4: Infrastructure construction projects has no positive influence on community revitalization

III. RESEARCH METHODOLOGY

This study was set out to assess the socio-economic impacts of construction infrastructure on economic and community development in Tanzania. The study employed a survey design approach in which a total of 500 respondents were sampled out using cluster sampling, purposive sampling and convenience sampling. The sample included construction professionals (engineers, builders, architects, and quantity surveyors) in contracting firms, consulting firms and government parastatals and individuals in the ten regions of Tanzania namely, Arusha, Dar es Salaam, Dodoma, Lindi, Morogooro, Mwanza, Pwani,

Shinyanga, Singida, and Tabora. These regions were selected because they host a vast majority of Tanzanian construction contractors and construction works. A total of 550 questionnaires were randomly distributed to the identified construction professionals and individual in which a total of 500 were returned and found fit for our analysis. Data gathered were analyzed using SPSS version 25 in which descriptive statistics and correlation were performed.

The multi-item scales of the construct based on previous literatures in order to test the identified hypotheses. All the items of four extract were measured by the means of a 5-point Likert scale manner of "1"- strongly disagree, "2"- disagree, "3"- neutral, "1"- agree, and "5"- strongly agree. The reliability and validity of scales that we used in this study were tested using the Cronbach alpha, in which a scale 0.80 was obtained; this was considered as ideal.

IV. FINDINGS AND DISCUSSIONS

Correlation Analysis

Correlation measures the statistical relationship between two variables. The research results which are summarized in Table I indicate that the correlation coefficient between construction project performance and community revitalization was positive 0.654. The results indicated that correlation coefficient between construction project performance and Infrastructure Improvement is positive 0.624. The results indicated that correlation coefficient between construction project performance and access to services is positive 0.584. Hence, the correlation coefficient between construction infrastructure and community development is positive 0.921. Based on study findings, the researcher found the relationship between variables was statistically significant at 0.05. Therefore, the four null hypotheses were rejected.

Table I: *Pearson correlation matrix*

		Economic Development	Infrastructure Development	Access to Services	Community Revitalization
Construction Infrastructure performance	Pearson Correlation	.921**	.624	.584**	.654
	Sig. (2-tailed)	.000	.000	.000	.000
	N	300	300	300	300

Regression Analysis

A multiple linear regression analysis was conducted to determine the relationship between dependent variable and independent variables.

Table II: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.848a	.545	.536	3.02201

a. Predictors: (Constant), Economic Development, Infrastructure Improvement, Access to Services, Community Revitalization

Coefficient of determination (r^2) in the model summary explains 54.5% of the independent variables. This implies that independent variables explain only 54.5% of the Economic Performance. The coefficient of determination is very significant because 45.5% of variations are brought about by characteristics not captured in the independent variables.

Table III: *Coefficientsa*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-13.239	4.623		2.864	.005
	Ecological Impacts	3.996	.521	.575	7.676	.000
	Environmental Impacts	-.127	.030	-.309	-4.206	.000
	Social Impacts	.326	.071	.361	4.601	.000

a. Dependent Variable: Economic Performance

The study conducted a multiple regression analysis so as to determine the association between construction infrastructure performance on the dependent variable: economic development, infrastructure improvement, access to services, and community revitalization.

The multiple linear regression model was of the form:

$Y = 12.221 + 3.631X_1 + 1.251X_2 + 0.761X_3 + 0.633X_4 + \alpha$.

According to the regression equation established, taking all factors into account with constant at zero, outcomes was 12.221. Taking all other independent variables at zero, construction infrastructure performance increase economic development by 3.631. While construction infrastructure performance will result in 1.251 increase in infrastructure development, construction infrastructure performance will result in 0.761 in access to service and construction infrastructure performance will result in a 0.633 increase in community revitalization. The probability value (P-value) is 0.005, 0.000, 0.000 and 0.000 respectively. Based on study findings, the researcher found the relationship between variables was statistically significant at 0.05. Therefore, the four null hypotheses were rejected.

Table IV: *Coefficientsa*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.221	6.361		2.684	.005
	Economic Development	3.631	.622	.765	7.766	.000
	Infrastructure Improvement	1.251	.050	.508	5.206	.000
	Access to Services	.761	.081	.631	4.061	.000
	Community Revitalization	.633	0.73	.579	3.987	.000

a. Dependent Variable: Economic Performance

Descriptive Analysis Effect of Construction Project Performance on Community Development

Table V shows the effect of performance of construction projects on community development of Tanzania and it could be revealed that job creation during construction was ranked first with MIS of 4.92 and SD of 9.45, increase in local spending was ranked second with MIS of 4.83 and SD of 9.40 extension of infrastructures was ranked third with MIS of 4.73 and SD of 9.30 while potential for economic diversification was ranked fourth with MIS of 4.65 and SD of 8.56. Upgraded roads was ranked fifth with MIS of 4.60 and SD of 0.853, public transportation & Other utilities was ranked sixth with MIS of 4.55 and SD of 0.850, improved access to health care was ranked seventh with MIS of 4.50 and SD of 0.845, improved education facilities was ranked eighth with MIS of 4.48 and SD of 0.720 while government expenditure was ranked ninth. Improvement in technology was ranked tenth, improvement in essential services was ranked eleventh while social cohesion was ranked twelfth.

Table V. *Effect of Construction Project Performance on Community Development*

Factors	Mean score	Standard Deviation	Rank
Job creation during construction	4.92	0.945	1
Increase in local spending	4.83	0.940	3
Extension of infrastructures	4.73	0.930	2
Potential for economic diversification	4.65	0.856	4
Upgraded roads	4.60	0.853	5
Public transportation & Other utilities	4.55	0.850	6
Improved access to health care	4.50	0.845	7
Improved education facilities	4.48	0.720	8
Government expenditure	4.40	0.710	9
Improvement in technology	3.82	0.652	10
Improvement in essential services	3.71	0.638	11
Social cohesion	3.62	0.612	12

From the above discussion, it can be deduced that effective construction projects brings about job creation during construction, increase in local spending, extension of infrastructures, potential for economic diversification, upgraded roads, improvement in public transportation & other utilities, improved access to health care, improved education facilities, government expenditure, improvement in technology, improvement in essential services, and social cohesion. All these factors enhance rapid growth in economic development of Tanzania. This result agrees with [4].

V. CONCLUSION AND RECOMMENDATION

The purpose of the study was to assess the role of construction projects community development in Tanzania. Findings depicted that that to the large extent construction projects had positive correlation with economic development, infrastructure improvement, community access to services, and community revitalization. This study concludes that construction projects make a crucial contribution to economic development and growth and bring important social benefits. They are of vital importance in order to make a nation grow and develop. In addition, providing access to employment, social, health and education services makes a road network crucial in fighting against poverty.

We recommend the central government and local governments of Tanzania to continue developing various construction projects in order to stimulate the economy at the household and national levels. Also, people living around the areas where the projects are located are advised to take advantage of these construction opportunities so that they can improve their living conditions.

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