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Community Participation and Perceptions of the Environmental Impact Assessment Process in Road Construction Projects: Reflections from Buhigwe and Handeni Districts

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ABSTRACT

Numerous factors influence the success of road construction projects, but the involvement of community members and their perception of the Environmental Impact Assessment (EIA) process are crucial. This study aimed to assess community perception and participation in areas where road construction projects have recently been implemented by the Government. Specifically, the study aimed to determine community participation and perception of EIA processes. A cross-sectional research design was employed whereby data were collected at once. Purposive and random sampling techniques were used to select the districts and villages. Simple random sampling was used to select household heads in the five selected villages (Hwazi, Kwedikabu, Kwamsisi, Songambele, and Murusi), where a total of 204 households were randomly sampled and data were collected using semi-structured questionnaires. Descriptive statistical and Likert scale analysis were used for analysing quantitative data. Findings show that community members in both ongoing projects demonstrated a modest level (2.7) of involvement and engagement in the EIA process. The majority of respondents (47.5% and 28.9%) had positive perception, and a minority (11.3% and 8.8%) had negative perception towards the EIA process. It is therefore important to tighten rules controlling the EIA process, including enforcement of penalties for non-compliance and establishment of clear norms for community involvement. The EIA process should be more visible and friendly, and detailed information about the project's impacts should be made available to all stakeholders for the sustainability of development projects.

Keywords*: Community participation, Public perception, Environmental impact assessment, Road construction projects, Stakeholders*

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1. INTRODUCTION

Roads play a crucial role in facilitating the movement of people and goods, which is essential for both production and consumption activities. A well-developed road network is closely linked to a country's economic development (Brewis *et al.,* 2020). There is a strong positive correlation between a country's economic growth and the quality of its road networks; in fact, roads are among the best catalysts for development. According to Sun & Kauzen (2023), improving the transportation infrastructure, including roads, ports, railways, and airports, is critical for Tanzania to enhance its internal and external trade and commercial activities.

Governments in developing countries have recognised the role that road transportation plays in reducing poverty (Onokala & Olajide, 2020). Tanzania is one of the emerging countries that has had strong economic progress in recent years, according to Kisamba & Li (2023). There is a growing need for improved transportation infrastructure to support economic development (Wamboye *et al.,* 2020). In response, the Tanzanian government has invested heavily in the construction of highways to improve the country's transportation infrastructure (Kulaba, 2019). However, several ecological, social, and environmental issues have been connected to Tanzania's recent road development (Kinyondo & Huggins, 2021).

The effectiveness of Environmental Impact Assessment (EIA), including engagement and full participation of community members and other stakeholders, tends to positively influence the sustainability of the road projects. According to Brogaard, *et al.* (2008), EIA is used to detect potential consequences that could be foreseen from development projects and is primarily a tool for environmental management to guarantee that impacts from development are minimised, avoided, or remedied. As a result, EIA should be taken into account throughout the entire project cycle, including feasibility, design, construction, and operation, per good practices principles, and it should also involve the public who will be directly impacted by or have an interest in the project (UNEP, 2002). Despite the significance of community involvement in EIA processes and the importance of understanding how the community feels concerning road construction projects as can be seen from previous literatures such as those by Brogaard, *et al.,* (2008), Gama, (2023) and Salaam, (2023), there is still a lack of sufficient research focusing specifically on assessing the extent of how the communities are participating and their perceptions on the process of various Environmental Impact Assessment/ Strategic Environmental Assessment (EIA/SEA). There is therefore an information gap preventing the effective consideration of community opinions and needs during road

construction projects, which could result in inadequate project outcomes and insufficient ownership by the communities. To facilitate more inclusive and sustainable project planning and implementation, it is therefore crucial to fill this research gap by examining the level of communities' participation in the EIA process and assessing their perceptions toward road construction projects. Therefore, this study's objective was to assess the community involvement and perceptions on EIA with regard to road projects.

The findings from this study help to increase community engagement. It highlights gap and obstacles, enabling more inclusive decision-making procedures, and boosting local communities' feelings of ownership of the projects and other development assets. The study contributes to better project results by revealing community's preferences, expectations and concerns. Project planners and policymakers are expected to use the findings in making informed choices and creating road construction projects that are in line with the community's demands. Further, the findings are encouraging the creation of socially responsible infrastructure and guarantee that projects are advantageous, culturally appropriate, and environmentally sound. Furthermore, this study aligns with Sustainable Development Goals (SDGs) numbers 9, 11, 16, and 17, which focuses on industry, innovation, and infrastructure; sustainable cities and communities; peace, justice, and strong institutions; and partnerships for the goals, respectively (UNDP, 2015).

1.2 Conceptual Framework

The study was guided by the Community Participation Theory (CP). The theoretical basis of community involvement originates from a wide range of social sectors, such as the community development movement of the 1950s and 1960s, public health, medicine, and adult learning (O'Mara-Eves *et al.,* 2013). The CP Theory mainly deals with providing an outline for understanding the dynamics of community involvement, the factors that influence participation, and the positive benefits of engaging community perspectives in decision-making processes.

Community Participation Theory is the idea that local communities should be involved in the programs and improvements that directly affect them. The theory is based on the idea that it's rational to give control to the people most affected by decisions and affairs. Some tenets of community participation theory includes; Community development - the principle that everyone in the community should participate in development projects and take equal responsibility; Self-reliance - community participation should help communities develop critical awareness, problem solving skills, and self-reliance;

process - community participation is a process that should be viewed over time, not achieved through occasional meetings; and Involvement - people should be allowed to participate in projects that affect their lives, but they cannot be forced to do so.

Based on the study's objective, that is, community perceptions and participations on EIA of road projects, the CP is used to show the link between community members' involvement and the EIA process of road projects. Furthermore, the CP theory acknowledges that community involvement makes development projects more productive and sustainable (O'Mara-Eves *et al.,* 2013). Therefore, community participation and perceptions highly improve the EIA for road projects outcomes, thus its sustainability.

2.0 METHODS

2.1 Description of the Study Area

This study was conducted in Buhigwe and Handeni districts of Kigoma and Tanga regions of Tanzania. Handeni District is found in Tanga Region and is located at longitude 38° East and latitude 5°30' South. Buhigwe District is located in Kigoma Region at a latitude -4.45088 and a longitude of 29.91369, or 04° 27′ 03.16″ S and 29° 54′ 49.28″ East (Figure 1). The two districts were selected because of the ongoing mega road construction projects. In Handeni district there is an ongoing construction of Makurunge - Saadani – Pangani – Road while in Buhigwe there is ongoing construction of Buhigwe – Manyovu road project. Apart from the ongoing mega road construction projects in these areas, they were suitable due to the developmental needs which were present and which will indirectly favour the community and nation due to the high economic growth potential these districts have. Also, due to policy reasons, conducting this study in these districts could help inform policymakers on how to improve community participation in road construction, address concerns about environmental impact, or ensure equitable benefits from infrastructure development in rural regions.

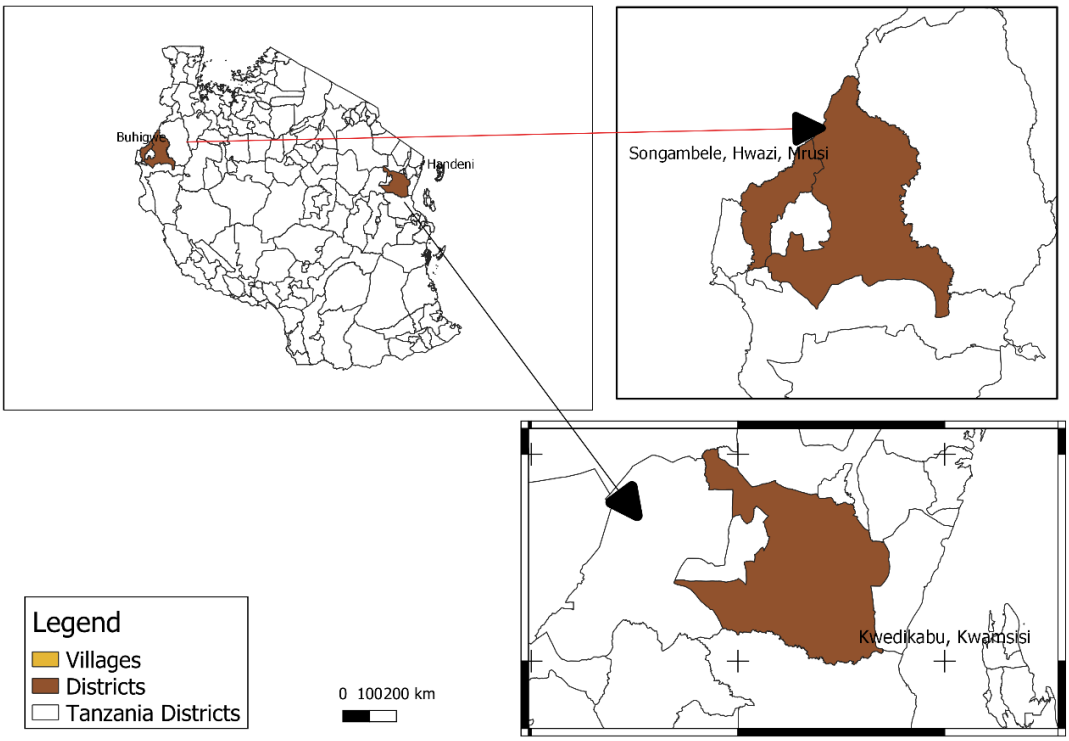

Figure 1: Location of the Study Areas

Source: Author

2.2 Research Design

A cross-sectional research design was used in this study. According to Matthew and Ross (2010), the cross-sectional design is considered appropriate since it enables data collection on both past and present experiences as well as the identification of any connections or cause-and-effect interactions between variables. Additionally, this method was chosen since it can achieve the study's goals and is simple to carry out, quick, economical, and does not take up a lot of time (Matthews & Ross, 2010).

2.3 Sampling Techniques and Sample Size

Both probability and non-probability sampling techniques were used in this study. A purposive sampling technique was used in selecting the districts and villages in which there are ongoing road construction activities. Simple random sampling was used to select the households to be used in the study from the sampled villages. The sample size was determined using Boyd *et al.* (1981) where the sample size was suggested to be

equal to or greater than 5% of the total population. And it was obtained through the formula;

$$C = \left(\frac{n}{N}\right) * 100$$

Where; n is the sample size, N is the total Population.

From 4080 households, a total of 204 households were determined to fit the sample size and were selected to participate in this study from both districts. In Buhigwe District, three villages namely Songambele, Hwazi and Murusi were selected while in Handeni District, only two villages namely Kwedikabu and Kwamsisi were sampled, these villages were selected because they are found along the roads which are under construction.

2.4 Data Collection

Using a structured questionnaire with closed-ended questions, primary data were gathered from the randomly selected respondents as it is one of the most suitable data collection methods for both qualitative and quantitative data, which does not limit the responses from respondents. The questions aimed to gather information on community members' level of participation and opinions of the entire EIA process of road construction. The data collecting instrument was pre-tested in the study area before real data collection to ensure familiarity and clarity. This helped to assure the validity and reliability of the data gathered.

2.5 Data Analysis

Quantitative data collected using questionnaires were analysed using the IBM Statistics, whereby both descriptive statistics such as frequencies and percentages were determined. The Likert scale analysis was used to analyse the level of participation of the communities adjacent to the road construction projects as well as their perceptions towards EIA using a 5-point Likert which showcased their level of participation and/or their perceptions from a low/poor to high/strong. This was done after obtaining their statements during data collection. For the questions containing statements for perceptions on a 5-point Likert scale, the intervals were designed for mean perceptions where 0-2.49 = Low/poor perception, 2.5-3.49= Moderate perception, and 3.5-5= High/Strong perception.

2.6 Ethical Consideration

All respondents willingly consented to be a part of this study after being thoroughly informed on this study. All information that could lead to the identification of these

respondents, such as their names, has been removed from being accessed by other individuals, with the exception of the author. The respondents were assured that their participation in this study would not expose them to any harm and they were provided with the right to withdraw at any stage without any consequences. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors, and the author declares that there is no conflict of interest.

3.0 RESULTS

3.1 Socio-economic Characteristics of the Respondents

Results in Table 1, show that, majority (71.6%) of the respondents were males and about 98% were married. In these Villages, about 95.1% of the respondents had informal education, while the family sizes were found to have a mean value of 4. On average, the majority of the respondents had lived in the areas for about 9 years.

Table 1: Socio-Demographics Characteristics

Characteristic	Category	Frequency	Percentage	Mean
Sex	Male	146	71.60%	
	Female	58	28.40%	
Marital status	Married	200	98.00%	
	Not married	4	2.00%	
Educational level	Informal education	194	95.10%	
	Primary education	10	4.90%	
	Secondary education	0	0.00%	
	Higher education	0	0.00%	
	University	0	0.00%	
Family size				4
Time living in the area				9

3.2 Community Participation in the EIA Process

Results in Table 2 show that local community members were highly engaged in the EIA processes with a mean value of 4.85. Other Local communities were also well informed on the potential impacts of the road project, with a mean value of 4.64. Other factors such as engagement in the decision-making process of the EIA, transparency and accessibility for community participation, community capacity building and

empowerment initiatives and the incorporation of people's concerns in the final EIA report and subsequent decision-making scored very low means.

Table 2: People Participation in EIA Process

Statements	Mean	SD	Participation Level
1. Stakeholders were actively engaged and consulted throughout the EIA process	4.85	0.43	High
2. Stakeholders expressed their concerns throughout the EIA process	2.68	1.82	Moderate
3. EIA process ensured inclusivity and representation of vulnerable groups	2.23	0.95	Low
4. Effective communication channels were established between stakeholders	1.30	0.83	Low
5. Stakeholders received information about the potential impacts of the road project	4.64	0.97	High
6. Decision-making process of the EIA was transparent and accessible for community participation	1.39	0.76	Low
7. Community capacity building and empowerment initiatives were implemented	2.28	1.68	Low
8. Final EIA report and subsequent decision-making incorporated community concerns	1.49	1.12	Low
Grand mean	**2.70**	**1.06**	**Moderate**

3.3 Perceptions of Community Towards EIA Process

Results in Table 3, show that, majority of the respondents (75.4% and 85.9% in Buhigwe and Handeni, respectively) agreed to the statement that EIA is more effective when there is community participation.

Table 3: **Community Perceptions towards EIA Process**

District	Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Buhigwe	EIA is more effective when there is community participation	47(37.3)	48(38.1)	12(9.5)	14(11.1)	5(4)
	EIA compensations raise living standards	52(41.3)	44(34.9)	11(8.7)	14(11.1)	5(4)
	EIA is important in road construction projects	42(33.3)	52(41.3)	17(13.5)	10(7.9)	5(4)
	EIA reduces environmental problems	23(18.3)	57(45.2)	22(17.5)	17(13.5)	7(5.6)
	EIA conducted was participatory	12(9.5)	63(50)	27(21.4)	10(7.9)	14(11.1)
	EIA has been more successful in road construction	23(18.3)	67(53.2)	10(7.9)	18(14.3)	8(6.3)
	EIA was thoroughly conducted	21(16.7)	71(56.3)	17(13.5)	10(7.9)	7(5.6)
	EIA community members' concerns have been ignored by the authorities	20(15.9)	69(54.8)	10(7.9)	12(9.5)	15(11.9)
Handeni	EIA is more effective when there is community participation	40(51.3)	27(34.6)	0(0)	10(12.8)	1(1.3)
	EIA compensations	47(60.3)	20(25.6)	0(0)	10(12.8)	1(1.3)

raise living standards					
EIA is important in road construction projects	26(33.3)	32(41)	10(12.8)	9(11.5)	1(1.3)
EIA reduces environmental problems	2(2.6)	35(44.9)	17(21.8)	16(20.5)	8(10.3)
EIA conducted was participatory	2(2.6)	43(55.1)	17(21.8)	8(10.3)	8(10.3)
EIA has been more successful in road construction	9(11.5)	42(53.8)	3(3.8)	16(20.5)	8(10.3)
EIA was thoroughly conducted	9(11.5)	43(55.1)	10(12.8)	8(10.3)	8(10.3)
EIA community members' concerns have be ignored by the authorities	3(3.8)	49(62.8)	2(2.6)	8(10.3)	16(20.5)

Results in Table 4 show that 18.6% more respondents had a high/strong perception on the conduct of EIA process in Buhigwe compared to respondents in Handeni district. Only 2.9% and 0.5% of the respondents had a moderate perception in Buhigwe and Handeni districts, which can also be termed as neutral. Moreover, 11.3% and 8.8% of the respondents had a low/poor perception towards EIA process. Additionally, the chi-square value showed no significant difference between the two districts (0.322). However, it is important to highlight that a sizeable percentage (11.3% and 8.8%) of community members had negative perceptions regarding the EIA process.

Table 4: Overall Community Perception Towards EIA Process

Perception Level	Buhigwe	Handeni	P value
High/Strong	97(47.5)	59(28.9)	0.322
Moderate	6(2.9)	1(0.5)	
Low/Poor	23(11.3)	18(8.8)	
Total	126	78	

*****Number in brackets are percentages (%)

4. DISCUSSION

Findings on community participation indicate that there is a potential for improvement in terms of raising the degree of engagement, even if it appears that some efforts have been made to incorporate communities' input. With such high scores in most of the activities in the project, it means that increasing community members' engagement, participation, and involvement is among the necessary factors to enhance ownership of the project among local communities. This will also guarantee that people's issues and perspectives are fully incorporated into the decision-making process.

These findings are in line with the study by Simpson and Basta (2018) which was conducted in Cape Town, South Africa talking about the importance of community participation in EIA projects reported that in these kinds of Government projects during EIA process, many decisions are made before even engaging the community members. Therefore, community members are just being used as rubber stamps, and they normally have very little to contribute during the process. However, in both Buhigwe and Handeni, local communities were engaged in some ways, making these two projects different from many others undertaken in other places.

Furthermore, according to the findings, the grand mean perception score for the two districts is more or less the same, indicating a relatively similar perception for both districts. Likewise, the two districts had similar perceptions on the factors influencing their perceptions. This could be highly influenced by the fact that most of the community members are aware of the EIA process in the development or the effectiveness of communication during the EIA process. The study findings augurs well with the study by Anukwonke & Muoghale (2019) which talked about the effectiveness and relevance of EIA in the sustainability of the built environment in Nigeria reported

that improving or raising the community awareness of the EIA processes for the road construction activities alters community members' awareness of more than one area or region. Therefore, it is recommended to improve the EIA awareness through capacity building.

Results on perception of communities towards EIA process shows that involving the communities in the EIA process is seen as beneficial and contributes to its efficiency and effectiveness. This is highly influenced by the community members' awareness towards the EIA process. The results of this study are consistent with those of Nzeadibe et al. (2015) who conducted a study in Niger Delta region on the community perceptions and cultural diversity in social assessment found that community members' perceptions can be greatly influenced by their degree of awareness and comprehension of the EIA process. Therefore, those who are aware of the benefits of community participation in the EIA process may be more likely to agree with the statement.

Regarding whether the compensation given raises the living standards of people, a majority of the respondents from Buhigwe and Handeni strongly agreed that the compensation is helpful. Based on these results, more than half of the respondents agreed that compensation provided to people is a good thing and that it contributed to raising the living standards of the people. This suggests a positive perception of the people regarding the effectiveness of the compensation in the two-road construction projects. The positive perception is an indication that most of the people with the project communities were compensated. However, like in any other project or activity it is difficult to have no complaints from the communities, especially in these large projects. There were some people who reported to have not received their compensation.

Findings in this study are consistent with another study by El Gohary and Armanious (2017) who analysed EIA Projects in Egypt found that compensation is probably significant in reducing some of the negative consequences that people might encounter as result of implementing a particular project or development activities in an area. The compensation could take different forms, such a monetary, assistance with daily expenses or other advantages aimed at lessening the project's negative effects on the impacted neighboIurhoods. When local community members were asked about the importance of EIA in road construction projects, a majority of them agreed that it is indeed important for EIA to be conducted in road construction projects. It is evident that some community members recognise the significance of conducting EIA before undertaking road construction projects. According to Mwanyoka *et al.* (2019) on a study

conducted in Tanzani assessing whether the community participation matters in natural gas extraction sector found that increasing the community's understanding of the value of the EIA procedures in road construction projects benefits both the project and the community members. This is because local community members will clearly understand the project and therefore offer a full participation in the project activities at the same time ensure proper environmental protection hence sustainable development.
A large proportion of the respondents agreed that EIA reduces environmental problems in both districts. Regarding whether the EIA conducted was participatory or not, it was evident that about more than half of the respondents in both Buhigwe and in Handeni districts agreed that the process was participatory. The findings are consistent with the study by Brozova and Ruzicka (2010) who assessed the usage of Analytical Hierachical Process and the Analytical Network Process in decision making process in transportation sector reported the importance of community participation in EIA process for road construction projects.

The perception of people on whether EIA has been more successful in road construction was positive. More than half of the respondents in both districts agreed that EIA has been more successful in road construction, meaning that the community members had a positive perception of the EIA process that was carried out. A degree of trust and confidence in the EIA's ability to recognise and reduce environmental impacts is reflected in its favourable assessment of the process's success. Future projects may receive greater attention and support from the community members because of this trust (Mitchell & Leach, 2019).

For an EIA to be effective and efficient, it should follow all the procedural requirements. A majority of the respondents in both districts agreed that compliance of the EIA to its procedure was quite high. This indicates that a large proportion of the respondents believed that the EIA process was conducted with sufficient comprehensiveness and attention to the required details. Other scholars found that, if community members view the EIA process as thorough and efficient, they are more likely to accept the outcomes and recommendations of the assessment (Den Broeder *et al.,* 2017). This can therefore lead to better acceptance and support for the proposed project and its associated activities. Local communities were also in the opinion that their concerns were taken into account during the EIA process. A majority of the respondents agreed. This implies that more than half of the respondents agreed and accepted the way the project handled local communities' issues. It was observed that the contributions of most of the community members during EIA meetings were taken on board. The government officials included their opinions in their implementation plans and ways of doing their

work. A study by Nelson *et al.* (2021) reported that most of the community members' suggestions during EIA processes are taken into consideration during project implementation.

Further results in Table 4 show that it is evident from these results that people in the selected districts were much happier with the project. In this way, they are therefore trustworthy to the project and the project will therefore be efficient and helpful for addressing environmental issues and promoting sustainable development. This suggests that some individuals within the communities might have doubts or misgivings about the EIA process's efficiency, openness, or inclusivity. Sandham *et al.* (2019) pointed out that the use of the Participatory Rural Appraisal (PRA) method had a significant capacity to enhance valuable public involvement, leading to the improvement of the EIA, building community capacity, and promoting sustainable resource use, thereby improving quality of life.

5. CONCLUSIONS

The participation of the community in the EIA process for road construction projects in Buhigwe and Handeni Districts is at a considerably high level. While efforts have been made to incorporate community inputs, there is still room for improvement in raising the degree of participation and engagement. Strategies and mechanisms, such as early compensation, improved communication channels, and enhancing community understanding of the EIA process, could enhance community involvement and address existing misunderstandings. In any project where there is community involvement, residents have a favourable opinion of the usefulness of the EIA. Although we tend to undermine their understanding, but in many places community members are aware of how crucial the EIA process is in minimising possible environmental consequences and enhancing positive results for the road construction projects. Based on the findings, it is evident that the level of community involvement is still problematic, and some residents believe that authorities are not doing enough to address the local communities' needs and concerns.

Community involvement in any EIA is crucial and mandatory for ensuring that critical issues and concerns are taken into account and incorporated as early as possible into the decision-making process. Project implementers and Government Officials should guarantee that community members have access to comprehensive and accurate information regarding the proposed projects at the same time ensuring that EIA process and reports are made more visible and accessible to the community members.

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