

Challenges of Community Participation in Road Maintenance Projects

Evidence from Babati District Council, Tanzania

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ABSTRACT

Community participation is promoted as a strategy to enhance the sustainability and cost-effectiveness of road maintenance, particularly in developing nations like Tanzania. However, its implementation often faces significant challenges. This study evaluates the specific challenges hindering effective community participation in road maintenance projects within the Babati District Council, Tanzania. A mixed-methods approach was employed, collecting quantitative data through structured questionnaires from 399 community members selected via simple random sampling, and qualitative insights from key informant interviews with local leaders and TARURA Regional Manager. Data were analyzed using descriptive statistics and content analysis. The findings reveal that community participation is severely constrained by a combination of factors: a critical lack of awareness about projects, significant financial constraints among community members, weak coordination between local government and residents, an absence of technical skills and training, prevalent corruption and mismanagement of funds, and poor communication and transparency in planning. These challenges collectively undermine community trust, willingness, and capacity to engage meaningfully. The study concludes that for community participation to be effective, a multi-pronged strategy is essential.

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Introduction

Road maintenance is vital for sustaining transportation infrastructure, fostering economic growth, and enhancing social integration [5]. Well-maintained road networks reduce vehicle operating costs, improve safety, and facilitate access to essential services, thereby improving overall quality of life [3],[14]. Despite these benefits, poor road conditions cost developing nations approximately 2% of their annual GDP, reflecting the heavy economic burden of neglected infrastructure [2],[23]. In many countries, road maintenance is hindered by limited funding, inadequate planning, and insufficient technical capacity, leading to deteriorating infrastructure that constrains economic and social development [11].

Globally, developed countries allocate substantial resources to maintain road networks. For instance, the United States spends approximately $92 billion annually on highway maintenance [5], and Germany dedicates €5 billion each year to sustain the Autobahn system [1]. In contrast, developing countries often face significant hurdles in implementing effective maintenance programs due to underfunding and weak institutional frameworks [6],[9].

Community participation has emerged as a strategy to enhance accountability, cost-effectiveness, and local ownership in road maintenance [17],[18]. Successful examples include Brazil, where participatory budgeting allows citizens to influence the allocation of funds for road repairs [24], and Australia, where the Roads to Recovery Program emphasizes community consultation to prioritize maintenance needs [4]. However, in developing countries, the implementation of community participation often faces systemic challenges such as poverty, low education levels, weak governance, and corruption, which limit the effectiveness and sustainability of projects [12],[16],[22]. Even initiatives that generate employment and improve access, such as Sri Lanka's NREGA program, often struggle with inefficiencies and lack of technical support [7],[10],[21].

In sub-Saharan Africa, the road maintenance needs are immense. Only 34% of the rural population lives within two kilometers of an all-weather road, and while programs such as Nigeria's Rural Access and Mobility Program (RAMP) have involved communities in maintenance efforts, inconsistent funding, political instability, and limited technical expertise have reduced their effectiveness [8],[13],[15].

Tanzania faces similar challenges. Roads are crucial for connecting communities to markets, schools, and healthcare facilities, especially in rural areas [19]. Despite government initiatives such as the Tanzania Social Action Fund (TASAF), which promotes community-driven road maintenance projects [20], many projects experience poor workmanship, inadequate technical guidance, and weak accountability mechanisms. Consequently, road infrastructure in

several districts, including Babati, continues to deteriorate, limiting the potential socio-economic benefits.

Although community participation has been promoted as a strategy to improve road maintenance outcomes in Tanzania, its implementation has faced significant challenges, resulting in mixed outcomes. Limited funding, lack of technical expertise, weak institutional support, and quality concerns hinder the sustainability and effectiveness of these projects. This study, therefore, evaluates the challenges of community participation in the implementation of road maintenance projects, using Babati District Council as a case study. Understanding these challenges is critical because it provides evidence-based insights that can inform policy, improve project planning and execution, and enhance the effectiveness of community-driven road maintenance initiatives in Tanzania and other similar contexts.

Methodology

A. Description of the Study Area

The study was conducted in Babati District Council, located in the Manyara Region. The district features diverse topographies, encompassing both rural and semi-urban areas. Its road network includes trunk roads extending approximately 223.5 km, along with numerous feeder roads that connect communities to essential services such as markets, schools, and healthcare facilities. Many of these roads are managed by TARURA, the authority responsible for overseeing rural and urban roads across Tanzania. Despite this, a significant portion of the district's roads remains in poor condition, posing challenges to local transportation and hindering economic development. Babati District Council also reflects several broader issues commonly experienced in rural areas of Tanzania, making it an ideal setting for examining the role of community participation in road maintenance projects. A sketch map of the district, illustrating the study area, is presented in Fig. 1.



Fig. 1. Sketch map showing the study area

B. Study Population

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The target population for this study consisted of community members actively involved in road maintenance projects within Babati District Council. These individuals play a pivotal role in the implementation of such projects, participating directly in activities including planning, execution, and oversight. Their engagement offered critical insights into the level of community participation, which is the central focus of this research. According to the 2022 National Census, Babati District Council had an estimated population of approximately 129,572 people. This population is diverse, encompassing individuals from various socio-economic backgrounds, which provided an opportunity to examine how levels of community participation and its impacts vary across different demographic groups.

C. Sample Size

The sample size for this study was determined using the Yamane formula and practical considerations based on the target population of 129,572. According to Yamane, 1967 [25] the sample must be representative enough to ensure the findings are generalizable to the broader community. Using Yamane's formula for sample size determination, a 95% confidence level and a margin of error of 5% was applied to calculate an appropriate sample size. The Yamane formula is given by;

$$n = \frac{N}{1+N(e)^2} \quad (1)$$

Whereby n is the sample size, N is the population size, and e is the margin of error. So,

$$n = \frac{129{,}572}{1+129{,}572\times(0.05)^2} = \frac{129{,}572}{324.93} = 398.77 \approx 399 \quad (2)$$

Therefore, the sample size of 399 participants for this study, was drawn from the population of community members in Babati District Council.

D. Sample Size

This study adopted a simple random sampling technique to select community members involved in road maintenance projects, ensuring that every individual in the target population had an equal chance of being included. This approach was appropriate given the diverse composition of the population in Babati District Council, as it minimized selection bias and enhanced the reliability of the findings.

In addition, key informants were selected through a purposive sampling approach to capture specialized knowledge and insights relevant to the study. These key informants included local leaders, the project manager, and the TARURA Regional Manager, all of whom were directly involved in road maintenance activities and policy implementation. The combination of simple random sampling for community members and purposive sampling for key informants allowed

the study to obtain both representative data and in-depth perspectives critical to understanding the role of community participation in road maintenance projects.

E. Data Collection Methods

1. Questionnaire

Structured questionnaires were used to collect quantitative data from community members involved in road maintenance projects in Babati District Council, Tanzania. The instrument focused on identifying the challenges faced by community members during their participation in these projects. It explored factors such as limited resources, inadequate technical knowledge, lack of coordination, and other obstacles that hindered effective involvement in road maintenance activities. Comprising closed-ended questions, the questionnaires facilitated consistent responses and allowed for systematic statistical analysis. The data provided detailed insights into the difficulties experienced by community members in planning, executing, and overseeing road maintenance initiatives, highlighting the practical barriers to meaningful community participation.

2. Key Informants Interview

Key informant interviews were conducted to collect qualitative data from individuals with specialized knowledge and direct involvement in road maintenance projects in Babati District Council, Tanzania. The key informants included local leaders, the project manager, and the TARURA Regional Manager. These interviews focused on identifying the challenges that affect community participation in road maintenance, including issues related to planning, resource allocation, coordination, and oversight. By engaging these key stakeholders, the study gained in-depth insights into the obstacles hindering effective community involvement, as well as strategies and experiences that could inform improvements in project implementation and sustainability.

F. Data Analysis

In this study, descriptive analysis was employed to examine the challenges hindering community participation in road maintenance projects. This method involved calculating frequencies and percentages to determine how often respondents reported specific barriers, providing an overview of the most commonly encountered challenges. Mean scores were also computed to assess the perceived severity of each challenge, with higher values indicating stronger agreement that a particular barrier significantly affects participation. Standard deviations were used to measure the variability of responses, showing whether opinions were consistent among respondents or widely dispersed.

For qualitative data obtained through key informant interviews, content analysis was applied. This technique involved systematically organizing and categorizing responses to explore the

challenges faced in community participation. The use of content analysis enabled a detailed understanding of the obstacles from the perspective of local leaders, the project manager, and the TARURA Regional Manager, complementing the quantitative findings.

Results and Discussion

A. Demographic Characteristics of Respondents

This section presents the demographic profile of the respondents who participated in the study. Understanding the demographic characteristics was crucial as it helped to interpret the findings and assess the diversity and representativeness of the study population. Key demographic variables considered include age, gender, education level, employment status, income and proximity to the project. These characteristics help to determine the respondents' capacity, interest and potential influence in rural road maintenance projects.

The results (Table 1) present the demographic characteristics of the respondents and provide a foundational understanding of the dynamics influencing community participation in rural road maintenance projects in Babati District Council.

Table 1. Frequency Distribution of Respondents by Demographic Characteristics (n=399)

Demographic Characteristics	Frequency	Percent (%)
Gender		
Male	244	61.2
Female	155	38.8
Age Group		
Below 20 years	55	13.8
20–29 years	97	24.3
30–39 years	111	27.8
40–49 years	95	23.8
50 and above years	41	10.3
Level of Education		
No formal education	24	6.0
Primary education	43	10.8
Secondary education	126	31.6
Tertiary education	111	27.8
Degree	95	23.8
Employment Status		
Employed	69	17.3
Self Employed	251	62.9
Unemployed	79	19.8
Household Income (TSH/Month)		
Less than 100,000	0	0.0
100,000–300,000	149	37.3
300,001–500,000	72	18.0
500,001–1,000,000	178	44.6
More than 1,000,000	0	0.0
Proximity to the Project (in km)		
Less than 1Km	0	0.0
1–3 Km	296	74.2
More than 3Km	103	25.8

The majority of participants were male (61.2%), indicating greater male involvement compared to females (38.8%). The relatively high female participation in this study challenges traditional gender norms and supports [20] findings, which emphasized the increasing role of women in community development. However, most these respondents were between 20 and 49 years. The age interval 30-39 had the highest proportion (27.9%) in the sample while those aged 20-29 and 40-49 had the proportions of 24.3% and 23.8% respectively.

This shows that youths highly participate in maintenance of road projects compared to younger and old age groups. This supports the findings of [17] who reported that middle-aged individuals are more engaged in community-based projects, while lower participation among those under 20 and over reflect limited capacity or competing priorities.

In terms of education level, a majority had attained at least secondary education, with 31.7% having completed secondary school and others holding tertiary (27.9%) or degree qualifications (23.8%). This contradicts earlier studies such as Raposo et al. [8], which associated rural participation with low literacy levels and suggests that the current community is better positioned to engage in both technical and administrative project aspects. Employment data shows that most respondents were self-employed (62.8%) which reflects flexible livelihoods that allow participation in communal activities. This patterns consistently with the predominance of informal work in rural Tanzania. In contrast, the unemployed (19.9%) is more available but face economic constraints, while the formally employed (17.2%) is limited by time despite potentially higher resources.

Monthly income levels indicate that 44.5% of respondents earn between TSH 500,001–1,000,000, followed by 37.4% earning TSH 100,000–300,000. This suggests a moderate-income population likely to contribute labor and time rather than financial resources which aligns with the findings by Roll et al. [26], who noted limited involvement of wealthier individuals in grassroots projects. Lastly, the majority of respondents (74.3%) resided within 1–3 kilometers of the road projects. These findings support those of Schübeler [27] which indicated that proximity enhances participation due to a stronger sense of ownership and direct benefit from the maintained infrastructure.

B. Challenges of Community Participation in Rural Road Projects

While community participation is widely acknowledged as a cornerstone of sustainable rural infrastructure development, various contextual barriers have been identified as limiting meaningful engagement in many local settings. To gain a deeper understanding of these constraints, this study examined a range of perceived and experienced barriers reported by respondents. The findings, as presented in Table 2, provide a systematic overview of these challenges through respondent perceptions measured across several key statements.

Table 2. Respondents' Perceptions of Challenges Hindering Community Participation in Road Maintenance Projects (n=399)

Statements	SD (%)	D (%)	N (%)	A (%)	SA (%)	Mean	STD
Lack of awareness about road maintenance programs prevents community members from participating.	0.0	0.0	8.3	45.0	46.7	4.38	0.638
Financial constraints make it difficult for community members to contribute to road maintenance projects.	0.0	0.0	10.8	44.2	45.0	4.34	0.667
Weak coordination between the local government and community members discourages participation.	0.0	0.0	12.5	39.2	48.3	4.36	0.696
Cultural and social factors (e.g., low willingness to volunteer, gender disparities) limit community engagement in road maintenance.	0.0	0.0	17.5	44.2	38.3	4.21	0.721
The absence of training and technical skills prevents community members from effectively participating in road maintenance activities.	0.0	0.0	9.2	45.0	45.8	4.37	0.647
Corruption and mismanagement of road maintenance funds reduce community trust and willingness to participate.	0.0	3.3	15.8	37.5	43.3	4.21	0.829
Poor communication and a lack of transparency in road maintenance planning discourage community involvement.	0.0	0.0	10.8	45.0	44.2	4.33	0.665

Key: SD = Strongly Disagree (1), D = Disagree (2), N = Neutral (3), A = Agree (4), SA = Strongly Agree (5)

The results from Table 2 reveal that a lack of awareness about road maintenance projects is a major barrier to community participation in the Babati District Council. A striking 91.7% (46.7% strongly agree and 45.0% agree) of respondents agreed or strongly agreed with the statement, with a mean score of 4.38 and a standard deviation of 0.638, indicating strong consensus among participants. This finding reflects a communication gap between local authorities and residents, suggesting that information about when, where and how communities can engage in road maintenance is either not sufficiently disseminated or is presented in inaccessible formats. As one interviewee stated,

> "… We only learn about road maintenance projects when it's almost too late, and there are no clear explanations on how we can get involved." – LLD 4

In rural areas like Babati, where educational levels and access to communication infrastructure can be limited, awareness campaigns play a vital role in mobilizing public support.

The absence of such efforts may leave many residents unaware of their expected roles, undermining the principles of participatory development. Similar findings have been observed in studies by Ezzatian et al. [32], who emphasized the importance of timely and inclusive information sharing in fostering community participation in local governance processes. This highlights the need for proactive outreach strategies, such as village meetings, radio broadcasts, and the use of local leaders as information conduits.

Another dominant factor undermining participation in Babati is financial constraints, cited by 89.2% (45.0% strongly agree and 44.2% agree) of respondents as a key limitation. With a mean score of 4.34 and minimal variation among responses, this finding reflects the economic reality faced by many households in the district. This is because the primary sources of livelihood, such as small-scale farming, livestock keeping and informal trading.

One respondent mentioned:

> "… There has been perceived favoritism within the community, with complaints of this nature arising due to budget constraints and the high demand for road maintenance." – LLD 13

This emphasizes the financial limitations that local authorities face, which in turn affect the level of community participation in road maintenance projects. The economic realities of Babati District Council, where livelihoods are often dependent on unstable and low-income sources such as small-scale farming, livestock keeping and informal trading, exacerbate the situation. This reinforces the argument by Burreta et al. [29], who contended that meaningful participation requires aligning development incentives with the lived realities of the poor. Therefore, if community members are expected to contribute consistently, mechanisms such as local community maintenance funds, matching grants or labor-for-cash schemes could ease the burden and incentivize engagement. Additionally, establishing partnerships with NGOs or private actors to subsidize community contributions could make participation more financially feasible for economically vulnerable groups.

The challenge of weak coordination between Local Government and community members was also emphasized, with 87.5% (48.3% strongly agree and 39.2% agree) of respondents in agreement and a mean score of 4.36. In Babati District Council, this may reflect the top-down nature of project planning, where decisions are often made by technocrats or District-level officials with limited consultation of grassroots stakeholders. Weak coordination can lead to duplication of efforts, low ownership, and misunderstandings about roles and expectations. For example, communities may not be informed about project timelines or responsibilities, leading to reluctance or even resistance when implementation begins. As noted by a TARURA Regional Manager in an interview,

> "… The lack of effective communication channels between the local authorities and the community has often resulted in delays and confusion regarding project timelines, leaving the community feeling excluded from the decision-making process."– TRM

This highlights how communities may not be adequately informed about project timelines or responsibilities, leading to reluctance or even resistance when implementation begins. This finding highlights the urgent need for strengthened participatory governance mechanisms, including structured feedback loops, regular community dialogue forums, and functional Ward Development Committees (WDCs). Such platforms would ensure that road maintenance programs are not only technically sound but also socially embedded and supported. This aligns with observations from empirical studies in similar rural contexts, such as by Eze et al. [30], who noted that procedural inclusion, without effective coordination, yields participation without empowerment.

Cultural and social factors, such as gender imbalances and limited volunteerism, were acknowledged by 82.5% (38.3% strongly agree and 44.2% agree) of respondents as obstacles to active engagement in road maintenance initiatives. The mean score of 4.21 and standard deviation of 0.721 show slightly more variation in responses, which is expected given the diverse cultural makeup of Babati District. In many rural Tanzanian communities, entrenched gender roles often confine women to domestic spaces and exclude them from physically intensive or decision-making roles. Similarly, youth may feel excluded from community governance processes, and there may be low enthusiasm for unpaid communal work among able-bodied adults. This corroborates insights from Glimmerveen et al. [31], who argued that participation cannot be inclusive unless there is deliberate effort to challenge and reshape exclusionary social norms. These dynamics contribute to passive community behavior and unequal contribution burdens. Addressing this challenge requires targeted behavioral change communication, the promotion of inclusive leadership structures, and the institutionalization of gender-sensitive participation quotas to ensure that road maintenance initiatives benefit from the diverse talents and perspectives of the entire community.

The absence of training and technical skills was another widely acknowledged challenge, with 90.8% (45.8% strongly agree and 45.0% agree) of respondents affirming this as a constraint and a mean score of 4.37. This underscores a critical capability gap within communities in Babati District. While willingness to participate may be present, many residents lack the technical knowledge necessary for effective involvement in road maintenance, ranging from proper drainage maintenance to understanding material specifications. This gap can result in poor-quality outcomes and even safety hazards. As one community leader noted,

> "… Many community members are eager to participate, but without the right skills and knowledge, their efforts can lead to poor quality work and safety concerns. We need proper training programs to equip them." – LLD 11

Thus, establishing local training workshops, possibly in collaboration with technical schools or NGOs, would equip residents with practical skills that enhance not only participation but also long-term ownership and maintenance of roads. Participation under these circumstances becomes symbolic rather than functional, a critique often levelled against "invited spaces" of participation [32]. Moreover, the integration of community-based supervisors or "barefoot engineers" could build local capacity and institutional memory over time.

Corruption and mismanagement of funds were also flagged as critical barriers to participation, with 80.8% (43.3% strongly agree and 37.5% agree) of respondents agreeing or strongly agreeing and a mean score of 4.21. Although slightly more variation was observed (standard deviation of 0.829), this still indicates that a significant portion of the population is concerned about the integrity of financial management in road projects. In Babati District, where transparency and accountability mechanisms may be underdeveloped, the perception of corruption can seriously undermine community morale and trust. To complement this, one of TARURA Regional Manager stated that,

> "… There has been perceived favoritism within the community, with complaints of this nature arising due to budget constraints and the high demand for road maintenance." – TRM

And one of the community leaders added that,

> "… currently, the community has no full trust in road maintenance projects due to corruption" – LLD 5

This reinforces the attitudes where residents are unlikely to contribute labor, time, or materials to projects where outcomes appear predetermined or mismanaged. As such, local authorities must implement open financial reporting, community monitoring teams and social accountability tools such as citizen report cards and public expenditure tracking surveys to rebuild trust and transparency in public infrastructure initiatives. The study by Munteanu et al. [33] and that of Nor et al. [34] affirm that perceived corruption reduces willingness to participate in collective initiatives, particularly in infrastructure development, where outcomes are often difficult to verify.

Lastly, poor communication and lack of transparency in road maintenance planning was reported by 89.2% (44.2% strongly agree and 45.0% agree) of respondents as a barrier, with a mean score of 4.33.

This challenge is closely linked with others, particularly weak coordination and lack of awareness, but deserves distinct attention due to its role in shaping community perceptions and expectations. In Babati, where traditional communication channels are still dominant, failing to

communicate project goals, responsibilities, and benefits can lead to confusion, disinterest, or mistrust. The finding is consistent with Ezzatian et al. [32] which emphasizes the role of dialogue, mutual understanding, and rational discourse in achieving consensus and coordinated action. This calls for the development of comprehensive communication strategies that leverage local media, community meetings, and visual tools such as community noticeboards or mobile SMS alerts. More transparent planning processes can empower residents to feel included and ensure they are adequately informed to participate meaningfully.

Conclusion

This study examined the challenges of community participation in road maintenance projects in Babati District Council, Tanzania, revealing that while community involvement is vital for rural infrastructure sustainability, its effectiveness is undermined by limited awareness, financial constraints, weak coordination, lack of technical skills, corruption, and poor communication. To strengthen participation, the study highlights the need for institutional reforms that enhance transparency, build trust, and promote gender-inclusive practices, alongside practical measures such as technical training, community maintenance funds, labor for cash schemes, and partnerships with NGOs and private actors. By aligning interventions with community realities and fostering inclusive governance, communication, and awareness, authorities can transform participation from symbolic to meaningful, thereby improving the sustainability, quality, and equity of rural road maintenance in Babati and offering lessons for broader rural infrastructure development in Tanzania and similar contexts.

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Conflict of Interest

The authors declare no conflict of interest.

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