



Report For

Assessing the availability and
accessibility of land transport services in
rural areas of Mainland Tanzania



Table of Contents

1. List of Abbreviations and Acronyms	1
2. Executive Summary	2
3. Introduction	10
3.1 Background	10
3.2 Context of the Study	10
3.3 Objectives of the Study	11
3.3.1 General Objective	11
3.3.2 Specific Objectives	11
3.4 Scope of the Study	12
3.4.1 Geographic Scope	12
3.4.2 Thematic Scope	12
3.4.3 Temporal Scope	13
3.5 Research Questions	13
4. Literature Review	14
4.1 Overview and Policy Context of Rural Land Transport	14
4.2 Rural Transport Infrastructure: Coverage, Quality, and Accessibility	14
4.3 Availability and Reliability of Rural Transport Services	15
4.4 Affordability, Inclusion, and Vulnerable Groups	15
4.5 Socio-Economic Impacts of Rural Transport Access	16
4.6 Identified Gaps in Existing Literature	16
4.7 Conceptual Framework (Theoretical Foundation)	16
4.8 Conceptual Framework (Application in the Study)	17
5. Methodology	18
5.1 Study Area	18
5.2 Research Design	19
5.3 Sampling Design and Sample Size Determination	19
5.3.1 Sample Size Determination for Quantitative Research	19



5.3.2 Sample Size Determination for Qualitative Research	22
5.3.3 Sampling Design.....	23
5.4 Data Collection Methods	24
5.4.1 Data Collection Instruments	24
5.5 Data Management and Analysis	26
5.5.1 Quantitative Data Analysis	26
5.5.2 Qualitative Data Analysis	31
5.5.3 Integration and Triangulation.....	31
5.6 Recruitment and Training of Research Assistants	31
5.7 Ensuring Permission for Data Collection	31
5.8 Ethical Considerations	31
6. Findings and Results.....	32
6.1 Assessment of Current Rural Transport Infrastructure	32
6.1.1 Understand the condition and usability of rural roads.....	32
6.2 Identify Transport Gaps & Challenges	70
6.2.1 Identify missing transport services and difficulties people face.	70
6.3 Evaluate Community Impacts	93
6.3.1 Income & Livelihoods (Economic Impact).....	93
6.3.2 Education Access & Outcomes	99
6.3.3 Health & Emergency Access.....	105
6.3.4 Social Life, Inclusion & Community Participation.....	110
6.3.5 Vulnerable Groups & Equity (Disability, Elderly, Pregnant Women)	116
6.4 Stakeholders and field recommendations	129
6.4.1 Identification of the Most Urgent Improvements for Rural Transport Services	129
6.4.2 Leadership responsibility for improving transport services.....	130
6.4.3 Community willingness to contribute to road maintenance	132
6.4.4 Preferred transport type to best serve the community.....	133
6.4.5 Incentives encouraging community participation in transport activities	134



7. Discussion	136
7.1 Dominance of Low-Standard Roads and Seasonal Inaccessibility	136
7.2 Transport Service Availability Shaped by Road Conditions	136
7.3 Affordability, Vulnerability, and Unequal Transport Burdens	137
7.4 Impacts on Livelihoods, Education, and Health	137
7.5 Governance, Community Participation, and Systemic Constraints	138
8. Strategic Recommendations.....	138
9. Future Studies Recommended by Tawi Consult to LATRA	142
10. Conclusion	147
11. References	148



1. List of Abbreviations and Acronyms

Abbreviation / Acronym	Full Meaning
AfDB	African Development Bank
FYDP III	Third Five Year Development Plan
FGD	Focus Group Discussion
KII	Key Informant Interview
LATRA	Land Transport Regulatory Authority
LGA	Local Government Authority
NBS	National Bureau of Statistics
ODK	Open Data Kit
PWD	Person with Disability
RAI	Rural Access Index
STATA	Statistical Software for Data Analysis
TARURA	Tanzania Rural and Urban Roads Agency
ToR	Terms of Reference
URT	United Republic of Tanzania
USD	United States Dollar



2. Executive Summary

(a) Background

Rural land transport is a critical lifeline for socio-economic development in Tanzania's Mainland, enabling access to education, healthcare, markets, and administrative services for over two-thirds of the population that resides in rural areas. Despite this importance, many rural communities still face limited access to safe, reliable, and affordable transport services. Challenges such as poor road conditions, seasonal inaccessibility, irregular transport services, and high travel costs continue to constrain mobility and restrict access to schools, health facilities, and markets. These deficits particularly impact vulnerable groups including women, children, the elderly, and persons with disabilities who encounter added physical, economic, and social barriers to mobility.

Purpose and Scope: In light of these gaps, the study was commissioned by LATRA to assess the availability and accessibility of land transport services in rural Mainland Tanzania, identify key service gaps and challenges, and evaluate the socio-economic impacts of rural transport (on livelihoods, education, health, and social inclusion). The assessment goes beyond cataloguing infrastructure to capture actual service availability, reliability, affordability, and user experiences, aligning with national frameworks (LATRA Act, National Transport Policy of 2003, FYDP III, and Tanzania's Development Vision 2025) to inform evidence-based regulatory decisions and inclusive rural development. The ultimate motivation is to provide data-driven insights that support policy reforms, investment prioritization, and improved coordination in strengthening rural transport systems for equitable growth.

(b) Methodology

Approach: The study employed a convergent mixed-methods approach, integrating quantitative surveys with qualitative interviews to ensure robust and policy-relevant evidence. Data collection covered five diverse regions Manyara, Lindi, Katavi, Mara, and Morogoro selected to represent a range of geographical and socio-economic contexts in rural Tanzania. In each region, one rural district was studied in depth, capturing variations in infrastructure quality, settlement patterns, and transport use.

Data Collection: Quantitative data were gathered through a cross-sectional household survey and a transport provider survey (totaling 370 respondents across the five study districts). This provided numerical indicators on road access, service frequency, costs, and usage patterns. Complementing this, qualitative data came from KIIs with officials (e.g. District Executive Directors, engineers, transport officers) and FGDs with community members (including women, youth, and persons with disabilities). These narratives contextualized the numbers with firsthand accounts of transport challenges and coping strategies. The mixed-method design enabled triangulation of findings, ensuring that statistical trends were cross-validated with community experiences. This approach provided a comprehensive understanding of both measurable conditions and lived realities. All data were collected from 1 to 31 November 2025 in accordance with established ethical protocols, and the analysis was aligned with the study's objectives and Tanzania's rural transport policy context.



(c) Result and findings

Road Access: Using road categories as defined by TANROADS and TARURA, 84.1% of households are connected primarily by earth (unpaved) roads, 13.4% by gravel roads, and only 2.2% by paved (bitumen-standard) all-weather roads. A small proportion (0.4%) reported having no formal road access, relying instead on footpaths. These findings indicate that most rural travel depends on lower-tier earth and gravel roads, which are highly vulnerable to seasonal damage. Stakeholders noted that many village and feeder roads become impassable during the rainy season, isolating communities. As one district leader explained, nearly all roads in his area are earth roads, and during rains vehicles often get stuck, at times forcing pregnant women to deliver en route. Reliable all-weather access remains a significant challenge for rural communities.

Road Condition: Most existing rural roads are in poor condition, undermining reliable transport. According to the household survey, over 81% of rural residents rated the condition of their nearest road as poor or very poor, with more than half (52.7%) calling it “*very poor*”. Only 18.8% rated their main local road as fair or better. This widespread deterioration means that even where roads exist, they are often barely usable: full of potholes, prone to flooding, and lacking maintenance. Indeed, year-round accessibility is severely limited only 18.4% of households reported their village roads are *always* passable throughout the year. The vast majority (81.6%) experience seasonal road closures or persistent difficulties, usually during rains when mud and erosion make travel dangerous or impossible. Field observations confirmed missing drainage and washed-out sections on many rural roads, explaining these seasonal failures. Qualitative testimonies reinforce the data: community members spoke of vehicles being marooned for days during rains, local travel times doubling due to road damage, and decades-long neglect of repairs leading to broken bridges and lethal delays in reaching services. Even in dry seasons, poorly maintained surfaces mean higher vehicle operating costs, slower trips, and unsafe travel. In short, chronic under-maintenance has left rural roads in a state where mere “*pass ability*” is not guaranteed, severely compromising consistent access to markets, schools, and clinics.

Transport Services: Rural transport services are scarce and irregular, leaving many villages effectively isolated despite road networks. Fewer than one-third of surveyed households (28.9%) have access to regular public transport services (e.g. daily or scheduled weekly buses) in their community. Another 25.3% report only occasional services (perhaps on market days), and nearly 46% of rural households have *no* public transport serving their village – including 37% that never had any service at all. In other words, almost half of rural communities lack functional, reliable transport connections to the outside world. This gap has been filled primarily by informal solutions. Motorcycle taxis (bodaboda) dominate rural transport, providing an estimated 80% of passenger transport in rural areas, according to local officials. Survey data likewise show 67.2% of households rely on bodaboda as a main means for daily travel, far outstripping the use of cars or buses. Walking (34.7%) and bicycles (32.9%) are also very common for lack of motorized options. By contrast, formal bus or minibus services reach only a minority (14% of households) and tend to operate only along major roads or cease during rainy seasons. The spatial and seasonal inequity of service is pronounced: ward centers or bigger villages might see a bus, but remote sub-villages have none, forcing residents to walk or hire costly motorcycles to reach transport nodes. At night or in emergencies, communities report virtually no transport available. Overall, rural transport services function as intermittent and informal offerings rather than



a dependable public utility, constrained by poor road conditions, low demand density, and profitability challenges for operators.

Transport Costs and Affordability: High transport costs pose a major barrier to rural mobility, especially for the poor and vulnerable. The majority of rural transport service providers consider current fares unaffordable for ordinary residents. In fact, 59% of transport operators rated rural transport as either very expensive or generally not affordable to the public. Several factors drive these costs. One is the added expense and risk of operating on bad roads – nearly 90% of providers have had to raise fares in recent times due to rising fuel prices or vehicle wear-and-tear from poor road conditions (with 69.2% reporting *frequent* fare increases to cover costs). Another factor is seasonality: during rains when routes become treacherous, fares often spike dramatically (community members noted fares tripling when roads are flooded). For rural households with very limited incomes, these price surges make travel prohibitive.

Affordability is lowest for society's most vulnerable. Transport providers identified the elderly and people with disabilities as the groups struggling most to pay fares (cited by 42.3% of operators), closely followed by women and students who often have constrained financial resources. Low-income households in general are also heavily affected. This means that those who arguably need transport the most the sick, the old, schoolchildren, pregnant women are often priced out or forced to rely on riskier means. The economic burden of transport in rural areas thus reinforces existing inequalities. Notably, while operators generally agree that regulations are not the main cost driver (half say regulation impact is neutral), they do cite issues like unofficial fines and fees that add to costs.

Social Inclusion: Gaps in rural transport disproportionately affect women and other vulnerable groups, undermining social inclusion. The study found that lack of transport directly constrains women's participation in economic and community life: about 59.6% of households reported that inadequate transport somewhat or severely limits women's ability to engage in social and economic activities, with one in four reporting severe limitations on women's mobility. Culturally and economically, when transport is scarce or unsafe, women are more likely to stay home – missing out on market trips, community meetings, or even visits to friends and family. Female FGD participants described being effectively “stuck” during the rainy season, unable to go to church or the marketplace. This curtailed mobility reinforces gender inequality by confining women to domestic spaces whenever roads fail.

Likewise, people with disabilities and the elderly face acute hurdles. Without accessible vehicles or proper road infrastructure, disabled individuals often have no choice but to walk (if they can) or pay exorbitant motorcycle fees, which many described as “not suitable for people like us”. The study's qualitative insights and provider surveys both highlight that elderly, disabled, and low-income groups often cannot afford or physically access available transport, leading to their exclusion from community events, services, and decision-making forums. In community meetings and public services, transport barriers mean older persons and PWDs are left behind, as noted by local leaders. The survey found that 45.5% of households have missed important community events (meetings, funerals, ceremonies) due to lack of transport, illustrating how poor connectivity erodes social cohesion. Overall, the findings make clear that transport inequality



reinforces broader social inequalities: those already marginalized by age, gender, disability or poverty suffer the greatest mobility constraints, further limiting their voice, opportunities, and integration in rural society.

Impact on Livelihoods: Insufficient rural transport directly impairs livelihoods and economic outcomes. A majority of households (59.2%) reported that transport problems have reduced their household income, through mechanisms like lost trading opportunities, spoiled produce, or inability to reach jobs. Very few (under 5%) saw any income gains linked to transport, indicating the overall impact is negative. The farm economy especially is constrained: 74.4% of rural households said poor roads hinder their ability to sell agricultural goods or access markets for inputs and outputs. When roads become impassable or transport is unavailable, farmers often cannot get their crops out, forcing distress sales at the village level. One community member noted that a farmer with sacks of rice “*may be forced to sell at low prices locally*” because they simply cannot transport produce to better markets, leading to lost income. Perishable goods frequently spoil a youth from Katavi described an instance where a truck breakdown stranded mangoes for two days, resulting in the entire harvest rotting. Such scenarios are common and mean that rural producers bear high risks and low returns due to transport bottlenecks.

In addition, limited transport stifles small businesses, inflates the cost of goods, and restricts employment options. Travel to major markets often remains time-consuming or costly for a third of households (about 34% take over 30 minutes to reach a market, often on foot or by expensive transport), which raises transaction costs and reduces competitiveness for rural traders. Transport was overwhelmingly cited as a top-tier development challenge by communities: roughly 79% of households ranked transport among the top three challenges in their area, and 46% called it the single most serious community problem above issues like water or education. This underscores that, in rural Tanzanian eyes, transport is not just a convenience but a foundational necessity for economic well-being. Local stakeholders echoed this sentiment, describing roads as the “foundation” that determines whether other development efforts can succeed. In summary, the lack of reliable, affordable transport services traps rural communities in a cycle of limited market access, low incomes, and vulnerability to exploitation (e.g. traders leveraging poor roads to pay farmers less), thereby entrenching rural poverty.

Education and Health Access: Reliable transport is essential for access to education and healthcare, and its absence is causing significant human development costs in rural areas. The survey revealed that nearly half of households (44%) had children who missed school in the past three months due to transport problems (such as impassable roads or lack of a ride). Moreover, about one-third of households reported that students have had to change schools or even drop out because of chronic transport difficulties for example, if the only secondary school is far away with no transport, or rainy season isolation interrupts schooling. As a result, rural children’s education is frequently disrupted not by lack of schools, but by the inability to physically reach the classroom. During rains, many students must walk kilometers on muddy paths; lateness and absenteeism spike, widening the gap between rural and urban educational outcomes. Stakeholders stressed that this absenteeism is “structurally induced rather than behavior-driven”, meaning children want to attend but transport barriers prevent them, especially in bad weather.



Healthcare access is similarly affected. Almost 49% of households said that at least once a family member could not reach needed healthcare because of transport limitations. In emergency situations a complication in pregnancy, a severe injury, an outbreak these delays can be life-threatening. In fact, vulnerable household members suffer the most: about 68% of households with a pregnant woman, disabled person, or chronic illness patient reported missing medical care due to lack of transport, with nearly half saying it happens “many times”. Rural clinics may exist, but if patients cannot travel the distance (or if ambulances cannot get to them), the effect is that healthcare is denied. Community testimonies highlighted heartrending cases such as women in labor unable to reach clinics in time due to flooded roads, or families having to pay TSh 100,000–200,000 (USD 40–80) to hire a private car in an emergency an exorbitant sum for poor villagers. Even non-emergency health needs are often postponed; roughly 42% of households have to travel over 30 minutes to the nearest health facility (and 22% over an hour), a journey that becomes far longer when transport is unavailable. Delayed care, missed treatments, and preventable complications are thus more common in rural communities. Taken together, the findings show that transport deficits are translating into reduced school attendance and compromised health outcomes, threatening to undermine rural human capital development over the long term.

(d) Stakeholder Insights and Discussion

Throughout the study, stakeholder voices from village residents to district officials reinforced and humanized these findings. There was a strong consensus that infrastructure deficiencies underlie most transport problems. Community leaders vividly described how seasonal road failures sever their access: for instance, villagers in Lindi noted that even after just one or two rains, roads become “very slippery and vehicles cannot pass”. In remote parts of Katavi, officials reported near-total isolation in the wet season, with only motorcycles daring to traverse muddy tracks. These stories confirm that seasonal isolation is a predictable norm, not an anomaly, in many rural districts causing people to miss funerals, weddings, and important community gatherings simply because roads are impassable. The social toll of this isolation is significant: stakeholders spoke of eroded community cohesion and support systems when families cannot connect due to transport breaks.

Stakeholders also highlighted the dominance of motorcycles and walking as coping strategies. As one Ward Officer put it, “Within the ward, especially remote sub-villages, there is no formal transport. People depend on *bodaboda* to reach central points.” In the absence of buses or cars, motorcycles fill the gap but come with safety and comfort trade-offs. Women and elderly participants voiced concerns about the dangers and indignities of motorcycle travel, yet they often have no alternative. A participant with disability noted he mostly has to walk, because hiring a motorcycle is “*expensive and not suitable for people like us.*” These insights underscore that current Transport means are far from ideal – they are used out of necessity, not preference, and exclude those unable to ride on a motorcycle or walk long distances.

Economic and governance perspectives were also provided. Agricultural officers and farmers alike discussed how traders exploit the situation: poor roads give buyers leverage to force lower farm-gate prices; a practice communities identified as a major issue. There were accounts of crop spoilage and losses directly caused by transport delays and breakdowns, reflecting a shared frustration that hard work in production is wasted



for lack of reliable transport to market. On the governance side, transport operators pointed to some regulatory pain points, such as excessive roadside fines or unclear permit requirements, which discourage them from serving remote routes. However, both officials and operators generally agreed that infrastructure quality and cost issues outweigh regulatory hurdles in the rural context. This feedback suggests that improving roads and incentivizing service in low-demand areas would do more to resolve rural transport woes than strict enforcement alone. Across all stakeholders, there was a palpable desire for greater government and institutional action to address these problems whether through road improvements, subsidies for rural transport, or better coordination in responding to emergencies. The voices from the field thus call for urgent, practical interventions to break the cycle of isolation and marginalization caused by deficient rural transport.

(e) Conclusions

Systemic constraints in rural transport continue to limit Tanzania's rural development and equity. The study's findings provide clear evidence that rural transport challenges are structural, persistent, and deeply intertwined with broader development outcomes. Despite policy reforms and some improvements (such as the establishment of TARURA for rural roads and LATRA's regulatory role), the reality on the ground is that the rural transport system is not yet meeting the everyday mobility needs of a large portion of the population. Physical connectivity is still dominated by low-standard roads that are vulnerable to weather and prone to collapse. This infrastructure deficit directly translates into limited, unreliable, and costly transport services when roads wash out, vehicles withdraw or curtail operations, fares shoot up, and communities are left stranded. Thus, rural transport access is not only inadequate but also highly unstable and seasonal.

The consequences of these transport gaps are far-reaching and inequitable. As the study shows, poor transport undermines agricultural productivity and incomes, disrupts students' education through absenteeism and dropout, and impedes access to healthcare and emergencies. These impacts hit the most vulnerable hardest: women, the elderly, people with disabilities, and children bear a disproportionate share of the burden, facing higher risks and fewer alternatives. In effect, the absence of reliable transport exacerbates rural poverty and social exclusion, making transport not just a mobility issue but a foundational determinant of equitable development and quality of life. Communities widely recognize this, as evidenced by their prioritization of transport among top challenges.

A key conclusion is that infrastructure quality and service viability not just formal regulations are the primary constraints on rural mobility. That said, regulation has a critical role to play in protecting users and enabling solutions. The findings suggest that LATRA and government partners must adapt their approach to reflect rural realities: informality, seasonality, and low-density demand require flexible, context-sensitive regulatory strategies. Strengthening rural transport will therefore require a coordinated, system-wide response that treats mobility as a public good and integrates infrastructure investment, regulatory innovation, and community engagement. Encouragingly, Tanzania's policy environment (e.g. decentralization to TARURA, focus on inclusive growth in FYDP III) provides a framework to address these issues. This study's evidence base can guide how to target those efforts.

(f) Strategic Recommendations



To move from analysis to action, the report outlines a set of strategic recommendations informed by the findings. These recommendations are practical, phased, and require collaboration across agencies. They distinguish measures that LATRA can implement directly from those that demand joint efforts with other stakeholders like TARURA, LGAs, and sector ministries. Below is a concise summary of key recommended strategies:

1. **Enhance Rural Road Infrastructure & Resilience:** *Coordinate with road authorities (TARURA and LGAs) to prioritize maintenance of critical rural road segments and implement spot improvements (culverts, drainage) on feeder roads.* Even small engineering fixes can greatly improve year-round pass ability. In parallel, advocate for increased investment in climate-resilient rural roads to address the root causes of seasonal isolation. Over the long term, making rural infrastructure durable and weather-proof will underpin all other transport improvements.
2. **Improve Transport Service Availability:** *Pilot and support targeted rural transport services on low-demand routes.* This could include incentives or subsidies for operators to serve remote villages, or community-based transport initiatives, ensuring even sparsely populated areas have baseline access. Additionally, facilitate the introduction of safer, higher-capacity vehicles (e.g. minibuses) on routes where roads have improved, so that over-reliance on motorcycles is reduced and rural residents have more secure options. Any such interventions should be closely coordinated with LGAs and operators to align with local needs.
3. **Strengthen Regulatory Oversight & Protection:** *LATRA should adapt its regulatory tools to better fit rural contexts.* Key actions include introducing indicative fare guidelines that distinguish dry season and rainy season pricing – this will protect rural consumers from exploitative fare hikes while acknowledging operators' higher costs in bad weather. LATRA can also simplify and tailor licensing and service guidelines for rural Transport means (motorcycles, tuk-tuks, etc.) to formalize and improve the currently informal services. Furthermore, establishing a formal complaint and redress mechanism for rural transport users is recommended, so that issues like overcharging or unsafe practices can be reported and addressed even in remote areas. Finally, more consistent and fair enforcement on rural routes is needed – for example, by coordinating inspection schedules to avoid arbitrary fines and build trust with operators.
4. **Promote Inclusivity and Safety in Transport:** *Mainstream social inclusion in rural transport planning.* LATRA and partners should embed gender and disability considerations into transport service standards and licensing, encouraging operators to accommodate pregnant women, disabled passengers, and other vulnerable users (e.g. by reserved seating or fare concessions). Collaboration with local authorities can help establish designated rural transport stops or shelters, improving safety and dignity for passengers who currently wait by roadsides. In emergencies, LATRA and LGAs should work with the health sector to organize community emergency transport schemes (such as subsidized ambulance services or community drivers lists), ensuring that lack of a ride is never a death sentence in rural villages.



5. **Build Data, Monitoring and Coordination Capacity:** *Institutionalize a focus on rural transport within LATRA's operations.* The report suggests routine monitoring of rural transport service availability at ward/district level and the inclusion of rural mobility indicators in LATRA's performance reporting. This will keep rural needs visible in regulatory decisions. Investing in simple data collection tools for rural transport (digital or paper-based) can help gather ongoing information on routes, fares, and service frequency. Over time, LATRA could conduct periodic rural transport assessments as a core function, akin to this study, to track progress. Importantly, stronger coordination mechanisms are recommended for instance, regular forums between LATRA, TARURA, LGAs, and transport operators to align infrastructure works with service regulation. Such partnerships will ensure that road improvements and transport services go hand-in-hand. Additionally, supporting community-led maintenance groups with technical guidance can foster local ownership and upkeep of rural roads, multiplying the impact of government efforts.

By implementing these strategic measures, Tanzania can move toward a rural transport system that is inclusive, affordable, and reliable year-round. The recommendations are designed for practical execution, some in the short term (e.g. fare guidelines, service pilots) and others requiring sustained effort (e.g. capital investments in infrastructure). Crucially, they call for a coordinated approach: LATRA's regulatory actions must be synchronized with infrastructure development by TARURA and local governments, supported by donors and central government where needed. This integrated strategy will enable Tanzania to systematically reduce rural isolation, improve equal access to services, and harness the full socio-economic potential of its rural communities. The study's evidence-based roadmap offers stakeholders a clear path to achieve safer, more accessible, and more inclusive rural land transport services in Mainland Tanzania, in line with national development aspirations and the needs voiced by its rural citizens.



3. Introduction

This chapter introduces the study and provides the contextual foundation for assessing the availability and accessibility of land transport services in rural areas of Mainland Tanzania. It outlines the background and contextual factors that necessitated the study and situates the assessment within the national policy, regulatory, and development framework guiding the land transport sector.

3.1 Background

Land transport is a critical enabler of socio-economic development in rural Tanzania, underpinning access to education, healthcare, markets, and administrative services while supporting economic participation, particularly in agriculture, trade, and small-scale enterprise development (URT, 2003; URT, 2021). In Tanzania, more than two-thirds of the population reside in rural areas (NBS, 2022), making the availability, reliability, and affordability of land transport services a decisive factor in determining livelihood outcomes and overall quality of life. Despite sustained public investment in transport infrastructure and rural development programmes, many rural communities continue to experience limited access to safe, reliable, and affordable land transport services. Poor road conditions, seasonal inaccessibility, irregular service provision, and high transport costs constrain mobility and restrict access to essential services such as schools, health facilities, and markets. These challenges disproportionately affect vulnerable groups, including women, children, older persons, and persons with disabilities, who often face additional physical, economic, and social barriers to mobility (URT, 2001; LATRA, 2020).

This study was undertaken to assess the level of availability and accessibility of land transport services in rural areas of Mainland Tanzania, identify key gaps and challenges in service delivery, and evaluate the socio-economic impacts of transport availability on rural communities. The assessment documents the types and characteristics of transport services available, evaluates their reliability and usability, examines user needs, and analyzes how transport access influences agricultural productivity, income generation, and access to education and healthcare services.

The study is anchored within key national policy and strategic frameworks, including the LATRA Act, Tanzania Development Vision 2025, the National Transport Policy of 2003, and FYDP III (2021/22–2025/26). By aligning with these frameworks, the study provides evidence to support regulatory decision-making, investment prioritization, and policy reforms aimed at strengthening inclusive, accessible, and sustainable land transport systems. The findings contribute to national efforts to enhance social inclusion, improve market access, and promote equitable rural development in line with national and global development objectives (URT, 2021; United Nations, 2015).

3.2 Context of the Study

Tanzania's geographical size, diverse terrain, and dispersed settlement patterns present persistent challenges to the provision of equitable and efficient land transport services in rural areas. Rural roads serve as the primary links between villages and economic and social service centres; however, many of these roads remain poorly maintained and highly vulnerable to seasonal disruption. During rainy seasons, flooding



and road erosion frequently render large sections of the rural road network impassable, isolating communities and limiting access to markets, schools, and health facilities (URT, 2003; NBS, 2022). In response to these challenges, the Government of Tanzania has implemented a range of institutional and policy reforms aimed at improving rural transport infrastructure and service delivery. The establishment of TARURA has strengthened the planning, construction, and maintenance of rural and feeder roads, contributing to improved physical connectivity and reduced travel times in many areas (URT, 2021). At the same time, LATRA, in collaboration with regional and local government authorities, regulates land transport services to ensure compliance with safety standards, fare regulation, and operational requirements (LATRA, 2020).

Notwithstanding these interventions, substantial gaps persist in ensuring consistent, affordable, and reliable transport services for rural populations. Transport services in many rural areas remain irregular, limited in coverage, or financially inaccessible to low-income households. Rapid urbanization has further contributed to these disparities by directing a disproportionate share of infrastructure investment toward urban and peri-urban centres, leaving remote rural areas comparatively underserved (URT, 2021). Demographic dynamics, including rural-to-urban migration and population growth in peri-urban zones, continue to place pressure on existing rural transport systems and reduce service availability in more remote locations. In addition, the increasing impacts of climate change manifested through flooding, erosion, and extreme weather events have heightened the vulnerability of rural transport infrastructure, underscoring the need for resilient, adaptive, and climate-responsive transport planning approaches (United Nations, 2015).

Within this context, this study provides an evidence-based assessment of rural land transport services that extends beyond infrastructure inventories to examine actual service availability, accessibility, affordability, and performance from the perspective of users and service providers. The findings offer a robust basis for strengthening regulatory oversight, improving service delivery models, and guiding targeted investments to enhance rural mobility. Ultimately, the study supports national efforts to ensure that rural transport systems contribute effectively to inclusive economic growth, social equity, and sustainable development.

3.3 Objectives of the Study

3.3.1 General Objective

The overall objective of this study is to assess the level of availability and accessibility of land transport services in rural areas of Mainland Tanzania.

3.3.2 Specific Objectives

To achieve the overall objective, the study is guided by the following specific objectives:

a) Assess Current Transport Infrastructure

To map existing land transport infrastructure in selected rural areas and evaluate the condition, functionality, and usability of roads and associated transportation networks.

b) Identify Gaps and Challenges



To identify key areas where adequate transport services are lacking and to analyze the structural, economic, and operational challenges faced by rural residents in accessing land transport services.

c) Evaluate Impact on Communities

To assess how the availability and accessibility of land transport services influence economic opportunities, access to education and healthcare, and levels of social connectivity within rural communities.

d) Propose Recommendations

To develop practical and evidence-based recommendations for improving land transport infrastructure and services in rural areas, including identification of potential funding sources and feasible implementation strategies.

The findings of this study are expected to generate critical insights into existing gaps and opportunities in rural land transport service delivery. These insights will form a robust basis for strategic recommendations aimed at enhancing the efficiency, inclusiveness, and sustainability of land transport systems in rural Tanzania.

3.4 Scope of the Study

This study was designed to assess the availability and accessibility of land transport services in rural areas of Mainland Tanzania. The scope was defined to ensure comprehensive coverage of spatial, thematic, and temporal dimensions relevant to rural land transport service delivery, while remaining consistent with the study objectives and the ToR.

3.4.1 Geographic Scope

The study was conducted in selected rural districts across five regions of Mainland Tanzania: Manyara, Lindi, Katavi, Mara, and Morogoro. These regions were purposively selected to capture a wide range of geographical conditions, settlement patterns, economic activities, and levels of transport infrastructure development. Within each region, one rural district was selected to allow for an in-depth assessment of rural road conditions, availability of transport services, accessibility challenges, and user experiences across diverse rural contexts.

3.4.2 Thematic Scope

The thematic scope of the study focused on the assessment of both transport infrastructure and land transport services in rural areas. Key thematic areas included the condition and usability of rural road networks; availability, reliability, and affordability of land transport services; accessibility of transport for different population groups, including women, older persons, and persons with disabilities; and the socio-economic impacts of transport availability on access to education, healthcare, markets, and livelihoods. The study also examined institutional and regulatory factors influencing rural land transport service provision.



3.4.3 Temporal Scope

The study assessed the current state of rural land transport services during the period of data collection, with reference to existing national policies, strategies, and regulatory frameworks governing the land transport sector. The analysis reflects prevailing conditions and recent developments in rural transport infrastructure and service delivery, particularly within the context of FYDP III (2021/22–2025/26).

3.5 Research Questions

The study was guided by the following four research questions, each corresponding directly to a specific study objective:

1. What is the current condition and usability of land transport infrastructure in selected rural areas of Mainland Tanzania?
2. What gaps and challenges exist in the availability and accessibility of land transport services for rural residents?
3. How does the availability and accessibility of land transport services affect economic opportunities, access to education and healthcare, and social connectivity in rural communities?
4. What measures can be implemented to improve land transport infrastructure and service delivery in rural areas of Mainland Tanzania?



4. Literature Review

4.1 Overview and Policy Context of Rural Land Transport

Rural land transport remains a central pillar of socio-economic transformation, particularly in countries characterized by dispersed settlement patterns and agriculture-based livelihoods such as Tanzania. Access to reliable, affordable, and safe transport services enables rural populations to participate in markets, access education and healthcare, and engage in administrative and social systems, thereby contributing to inclusive development and poverty reduction (World Bank, 2022; AfDB, 2023). In Tanzania, where over two-thirds of the population resides in rural areas, transport systems play a decisive role in shaping livelihood outcomes, spatial equity, and economic participation (NBS, 2022). National policy frameworks have consistently emphasized the strategic importance of rural transport. Tanzania Development Vision 2025 highlights infrastructure development as a prerequisite for achieving middle-income status, while FYDP III (2021/22–2025/26) prioritizes transport systems as key enablers of economic competitiveness and human development (URT, 2021).

However, there is an increasing need to assess alignment with the emerging National Development Vision 2050, particularly in relation to inclusive development. Vision 2050 emphasizes equitable access to services, economic opportunities, and infrastructure across all population groups. Despite policy commitments, evidence suggests that rural populations continue to face persistent transport constraints that limit access to markets, healthcare, and education, indicating potential gaps in achieving the Vision's inclusivity objectives (World Bank, 2023; UNECA, 2024). The National Transport Policy (2003) provides the overarching framework for expanding transport services, emphasizing affordability, safety, and private sector participation. Complementary frameworks, including the Rural Development Strategy, identify high transport costs, poor road conditions, and limited-service availability as critical barriers to rural development (URT, 2001). Institutionally, LATRA plays a central role in regulating land transport services to ensure safety, affordability, and accessibility. Its Strategic Plan acknowledges persistent rural transport challenges and identifies rural transport assessment as a priority regulatory function (LATRA, 2020). Recent global evidence reinforces that transport systems must be treated not merely as infrastructure but as inclusive service systems, requiring integrated policy, regulatory, and investment approaches to ensure equitable access (OECD, 2021; World Bank, 2022).

4.2 Rural Transport Infrastructure: Coverage, Quality, and Accessibility

The literature consistently identifies rural road infrastructure as the backbone of rural transport systems. In Tanzania, over 90% of district and feeder roads remain unpaved, with a dominance of earth and gravel roads that are highly vulnerable to seasonal disruptions (TARURA, 2022; World Bank, 2023). This structural limitation significantly constrains year-round accessibility. Recent studies across Sub-Saharan Africa show similar patterns. For example, research in Ethiopia and Uganda demonstrates that poor rural road conditions reduce mobility reliability, increase transport costs, and limit access to markets and services (Gebresenbet & Hagos, 2021; Porter et al., 2021). In India, comparable findings indicate that rural road quality directly influences agricultural productivity and service access (Asher & Novosad, 2020). The Rural Access Index



(RAI) remains a key measure of connectivity. While improvements have been observed globally, many low-income countries still report low levels of all-weather road access, particularly in remote areas (World Bank, 2022). In Tanzania, connectivity improvements remain uneven, with remote and low-density regions continuing to face significant accessibility challenges. Emerging literature emphasizes the importance of climate-resilient infrastructure, as climate variability increasingly exacerbates rural road degradation through flooding and erosion (AfDB, 2023; UNEP, 2024). This underscores the need for infrastructure investments that go beyond expansion to focus on durability and resilience.

4.3 Availability and Reliability of Rural Transport Services

Beyond infrastructure, the availability and reliability of transport services are critical determinants of rural mobility. In many rural contexts, including Tanzania, transport services remain largely informal, fragmented, and market-driven, with limited scheduled operations (World Bank, 2022). Motorcycle taxis (bodaboda) have emerged as dominant transport modes due to their flexibility and ability to operate on poor roads. Similar trends are observed in countries such as Kenya, Nigeria, and Bangladesh, where informal transport systems fill critical service gaps but raise concerns regarding safety, regulation, and service consistency (Porter et al., 2021; Rahman et al., 2022).

However, reliance on informal systems results in:

- Irregular service availability
- Limited coverage in remote areas
- Safety risks
- Weak regulatory oversight

Seasonality further exacerbates service unreliability, as operators often suspend services during rainy periods due to increased risks and costs. Recent studies highlight that rural transport systems are highly sensitive to road conditions, demand density, and profitability constraints (World Bank, 2023; ITF, 2021). Regulatory challenges persist due to the dispersed nature of rural settlements and the informal structure of service provision. While LATRA regulates fares, safety, and licensing, enforcement remains constrained in rural areas. Literature increasingly points to the need for adaptive regulatory frameworks that accommodate rural realities, including low demand and informality (OECD, 2021).

4.4 Affordability, Inclusion, and Vulnerable Groups

Affordability remains a critical barrier to rural mobility. Transport costs often represent a significant share of household expenditure, particularly among low-income populations (World Bank, 2022). In many cases, high transport costs force households to rely on walking or non-motorized transport. Recent literature highlights that transport inequality disproportionately affects vulnerable groups, including women, persons with disabilities, and the elderly. Studies in Ghana and Nepal show that women face mobility constraints due to safety concerns, cultural norms, and limited financial resources (Lucas et al., 2021; World Bank, 2023).



Transport barriers also have direct implications for health and education outcomes. Limited access to transport delays healthcare utilization and contributes to poor maternal and child health outcomes (WHO, 2022). Similarly, transport constraints are associated with school absenteeism and dropout rates in rural areas (UNESCO, 2023). Despite policy commitments to inclusive transport, implementation gaps persist. Recent literature emphasizes the need for targeted interventions, including subsidized transport, accessible vehicle design, and gender-responsive transport planning (ITDP, 2022).

4.5 Socio-Economic Impacts of Rural Transport Access

A substantial body of recent literature confirms that improved rural transport access generates significant socio-economic benefits. These include:

- Increased market participation
- Reduced transport costs
- Improved access to services
- Enhanced income opportunities

Studies in Rwanda and Vietnam show that improved rural transport connectivity leads to increased agricultural productivity and reduced poverty levels (World Bank, 2022; Nguyen & Nguyen, 2021). Similarly, evidence from Kenya indicates that improved transport access enhances labor mobility and employment opportunities (AfDB, 2023). However, recent research also highlights potential unintended consequences. Improved connectivity can expose rural producers to increased competition, potentially reducing farm-gate prices if not accompanied by complementary market interventions (World Bank, 2025). Overall, the literature suggests that transport improvements must be integrated with broader development strategies to maximize benefits and ensure inclusive outcomes.

4.6 Identified Gaps in Existing Literature

Despite growing attention to rural transport, several gaps remain:

- i. Limited empirical evidence on village-level transport service availability and reliability
- ii. Underrepresentation of user perspectives, particularly vulnerable groups
- iii. Insufficient analysis of regulatory effectiveness in rural contexts
- iv. Limited integration of seasonality and climate impacts in transport studies

This study addresses these gaps by combining infrastructure assessment, service analysis, and community perspectives to provide a comprehensive understanding of rural transport systems.

4.7 Conceptual Framework (Theoretical Foundation)

This study is grounded in three key theoretical perspectives:



- i. **Transport–Development Theory:** Transport infrastructure is viewed as a productive asset that reduces transaction costs, enhances market access, and supports economic integration (World Bank, 2022).
- ii. **Accessibility Theory:** Development outcomes depend on the ability of individuals to reach services and opportunities within acceptable time, cost, and safety conditions (Geurs & van Wee, 2021).
- iii. **Equity and Inclusive Mobility Framework:** Transport benefits are unevenly distributed, with vulnerable groups facing disproportionate barriers. Inclusive transport systems are therefore essential for equitable development (Lucas et al., 2021).

4.8 Conceptual Framework (Application in the Study)

The conceptual framework was not only theoretical but operationally applied throughout the study.

(a) Application in Study Design

The framework guided the structuring of the research around four interconnected components:

- Infrastructure condition
- Transport service characteristics
- Accessibility and mobility
- Socio-economic outcomes

(b) Application in Data Collection Tools

Survey instruments, interview guides, and observation checklists were designed to capture variables aligned with the framework, including:

- Road type and condition
- Service availability and frequency
- Travel time and costs
- Accessibility challenges
- Socio-economic impacts

(c) Application in Data Analysis

The framework informed both quantitative and qualitative analysis by:

- Structuring regression models linking transport variables to outcomes (health, education, income, social participation)



- Guiding thematic coding of qualitative data
- Enabling triangulation across data sources

(d) Application in Interpretation

The framework provided a systems-based lens to interpret findings, highlighting how infrastructure, services, regulation, and user conditions interact to shape transport outcomes.

5. Methodology

This chapter outlines the methodology employed to assess the availability and accessibility of land transport services in rural areas of Mainland Tanzania. The methodology was designed to generate robust, reliable, and policy-relevant evidence through an integrated use of quantitative and qualitative research approaches. It aligns with the Terms of Reference (ToR), national development frameworks, and best practices in transport and socio-economic research. The approach ensures that both measurable service characteristics and lived experiences of rural communities are adequately captured, analyzed, and translated into actionable recommendations.

5.1 Study Area

The study was conducted in selected rural areas across Mainland Tanzania, with focused assessments in five regions: Manyara, Lindi, Katavi, Mara, and Morogoro. These regions were purposively selected due to their distinct geographical, socio-economic, and infrastructural characteristics, which together provide a representative picture of the diversity of rural transport realities in the country. The regions differ significantly in terms of infrastructure investment levels, access to essential services, dominant livelihood systems, population density, and vulnerability to climatic and environmental constraints. One rural district was selected from each region based on criteria including geographic spread, population size, severity of transport challenges, predominant economic activities, and potential for scaling up practical solutions.

The selected districts are:

- Kiteto District (Manyara Region):** A predominantly pastoralist district characterized by vast, sparsely populated landscapes and limited road infrastructure, much of which becomes impassable during the rainy season. Poor road conditions constrain access to markets, health facilities, and schools.
- Liwale District (Lindi Region):** An agriculturally productive inland district facing persistent connectivity challenges, particularly during the rainy season. Limited paved infrastructure restricts market access and economic mobility for farmers.
- Mpimbwe District Council (Katavi Region):** A newly established and remote district with limited road networks and weak linkages to major service centers. Transport constraints significantly affect access to healthcare, education, and economic opportunities.



- iv. Serengeti District (Mara Region): A conservation-sensitive district bordering Serengeti National Park, where rural communities experience poor transport infrastructure despite the area's tourism importance, limiting access to services and markets.
- v. Mlimba District (Morogoro Region): A mixed agriculture and agro-pastoral district with dispersed settlements. While some feeder roads exist, large areas remain seasonally inaccessible, affecting employment, market integration, and service access.

The selection of these districts ensures coverage of a wide spectrum of rural transport contexts, enabling identification of systemic gaps, region-specific challenges, and scalable best practices. District-level consultations further validated site selection and strengthened local ownership of the study.

5.2 Research Design

The study adopted a convergent parallel mixed-methods research design to obtain a comprehensive understanding of rural transport conditions. This design was selected to combine quantitative and qualitative evidence, enable triangulation, cross-validate findings, and provide a more comprehensive and credible understanding of rural transport conditions. The design allowed quantitative data (household survey results) and qualitative data (interviews and focus group discussions) to be collected at the same time, analyzed independently, and then compared and integrated during interpretation. This approach made it possible to explain statistical patterns using qualitative insights while strengthening the reliability and validity of the findings. The quantitative component followed a cross-sectional survey design, capturing data on transport availability, service frequency, affordability, travel time, and access to essential services at a single point in time. The qualitative component employed a descriptive and exploratory approach, using key informant interviews and focus group discussions to examine institutional, social, and contextual factors influencing transport service delivery and use. A documentary review of relevant policies, strategies, regulations, and previous studies complemented field data by situating findings within the national policy and regulatory context.

5.3 Sampling Design and Sample Size Determination

This study applied both probability and non-probability sampling techniques under the mixed-methods framework to ensure representativeness and depth of analysis.

5.3.1 Sample Size Determination for Quantitative Research

The determination of the quantitative sample size was based on the known population of the five selected districts using data from the 2022 National Population and Housing Census (NBS, 2022). The combined population of the study districts was:

- Mpimbwe (Katavi) – 215,438
- Liwale (Lindi) – 136,505
- Kiteto (Manyara) – 352,305



- Serengeti (Mara) – 340,349
- Mlimba (Morogoro) – 292,536

Total Population (N) = 1,337,133

The sample size was calculated using **Yamane's (1967)** formula for a known population:

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

Where:

- n = required sample size
- N = total population (1,337,133)
- e = level of precision

Source: Yamane, T. (1967). Statistics: An Introductory Analysis (2nd ed.). New York: Harper and Row.

Using a precision level of approximately 5.2%, the computed sample size was approximately 370 respondents at a 95% confidence level. This confirms that the formula was applied to a known population, not an unknown one.

Proportional Stratification

Proportional stratified sampling was conducted in two stages:

Stage 1: District-Level Stratification

Each district formed a primary stratum. The total sample ($n = 370$) was distributed proportionally according to each district's share of the total population using:

$$n_h = \frac{N_h}{N} \times n$$

Where:

- n_h = sample allocated to district h
- N_h = population of district h
- N = total population
- n = total sample (370)

Stage 2: Village-Level Allocation



Two villages were selected in each district (10 villages in total). The selection of villages was guided by predefined criteria to ensure representativeness of rural transport conditions. These criteria included:

- (i) Variation in geographic location (central versus remote areas),
- (ii) Differences in road accessibility and transport availability,
- (iii) Population size, and
- (iv) Relevance to dominant livelihood activities such as farming, pastoralism, and trade. This ensured that the selected villages capture diverse transport realities within each district.

Population figures were obtained from the 2022 Population and Housing Census (PHC) Administrative Units Population Distribution Report, which provides official statistics at ward and village levels (URT/NBS, 2022). Where villages correspond directly to census wards, official ward population figures were used as proxies for village populations, consistent with national statistical reporting structures. The district sample was distributed across the selected villages using a Probability Proportional to Size (PPS) approach. Under this method, each village received a share of the sample proportional to its population relative to the total population of the sampled villages within the district. This ensured that more populous villages were allocated a larger sample size, thereby improving representativeness and reducing sampling bias.

The allocation followed the PPS formula:

$$n_i = \frac{N_i}{\sum N_i} \times n_d$$

Where:

- n_i = sample allocated to village i
- N_i = population of village i (2022 PHC)
- $\sum N_i$ = total population of selected villages in the district
- n_d = total sample allocated to the district

A small buffer was incorporated to account for non-response and incomplete questionnaires while maintaining the proportional structure of the sample.

Table 1: Quantitative Sample Distribution by Region, District, and Village (2022 PHC)



Region	District	District Population	Village	Population (2022 PHC)	% Share	Households (n)	Transport Providers (n)	Total Sample
Katavi	Mpimbwe	215,438	Kibaoni	14,102	40.60%	11	6	17
			Majimoto	20,674	59.40%	17	8	25
Lindi	Liwale	136,505	Makata	6,812	51%	14	7	21
			Mirui	6,500	49%	13	6	19
Manyara	Kiteto	352,305	Kijungu	12,972	50%	18	9	27
			Lesoit	13,000	50%	18	8	26
Mara	Serengeti	340,349	Geitasamo	5,038	24.70%	11	3	14
			Kisaka	15,338	75.30%	29	6	35
Morogoro	Mlimba	292,536	Chita	27,858	51%	44	15	59
			Ikule	27,000	49%	42	14	56
Total		1,337,133	10 Villages	—	—	277	93	370

Village populations are derived from the 2022 PHC administrative units' dataset, which provides official population figures at ward level, used here as proxies for sampled villages. The quantitative survey targeted rural residents who regularly use or are affected by land transport services, including adult men and women (18+), farmers, pastoralists, traders, youth, elderly persons, persons with disabilities, and household heads or knowledgeable adults. This ensured representation across key livelihood and vulnerability groups.

5.3.2 Sample Size Determination for Qualitative Research

The qualitative sample size was determined using the principle of data saturation, whereby interviews and discussions continued until no substantially new themes or insights emerged. Across the five selected districts, over 215 participants took part in key informant interviews (KIIs) and focus group discussions (FGDs). A purposive sampling approach was adopted for the qualitative component for three main reasons:

1. Specialized Knowledge Requirement: Rural land transport systems involve institutional, regulatory, operational, and community dimensions. Participants such as District Engineers, LATRA and



TARURA representatives, transport service providers, and village leaders possess specific knowledge that cannot be randomly sampled from the general population.

2. **Context-Specific Experience:** The study aimed to understand practical transport challenges, seasonal disruptions, regulatory gaps, and lived experiences. Purposive sampling ensured inclusion of individuals directly affected by or responsible for transport service delivery.
3. **Depth Over Statistical Generalization:** The qualitative component sought in-depth explanations, institutional perspectives, and contextual insights to complement quantitative findings. Random sampling would not guarantee the inclusion of information-rich participants capable of providing detailed explanations.

Participants therefore included:

- District Executive Directors, Engineers, and Transport Officers
- Representatives from LATRA and TARURA
- Village and Ward leaders
- Transport service providers (bus operators, bodaboda leaders, logistics agents)
- Rural residents, with emphasis on women, youth, elderly persons, and persons with disabilities

Data collection continued until thematic saturation was achieved across districts and stakeholder categories.

5.3.3 Sampling Design

For the quantitative component, proportional stratified random sampling was applied in a structured sequence. First, stratification was conducted at the district level, where each of the five selected districts formed a primary stratum. This ensured that every study region was represented in the sample. Second, within each district, villages were grouped based on key transport-related characteristics such as dominant road type (bitumen, gravel, or earth), accessibility level, and settlement distribution. This created sub-strata reflecting differences in transport conditions. After defining the strata, proportional allocation was performed using 2022 National Population and Housing Census data. Districts and villages with larger populations were assigned a proportionally larger number of households in the sample. Household selection within each village was then conducted using random sampling techniques. Stratified proportional sampling was therefore performed at the household selection stage, after districts and villages had been classified into strata. This approach ensured:

- Representation of all study districts,
- Fair reflection of population size differences,
- Inclusion of varying transport conditions across locations.



For the qualitative component, purposive sampling was used to select information-rich participants, including local government officials, transport service providers, and community leaders. This allowed for in-depth exploration of institutional and contextual issues that could not be adequately captured through survey data alone.

5.4 Data Collection Methods

Data collection employed complementary methods to ensure depth, validity, and triangulation of findings. Each method was selected for a specific purpose aligned with the study objectives.

i. Quantitative Household Surveys:

Structured surveys were administered to rural households to generate measurable evidence on transport access, costs, reliability, safety, travel time, and socio-economic impacts. This method enabled statistical analysis, identification of patterns across districts, and comparison of transport conditions among different population groups.

ii. Key Informant Interviews (KIIs):

Interviews were conducted with local government officials, LATRA and TARURA representatives, community leaders, and transport service providers. KIIs were used to obtain institutional, regulatory, and operational insights that could not be captured through structured surveys. They provided deeper understanding of service gaps, infrastructure constraints, and implementation challenges.

iii. Focus Group Discussions (FGDs):

FGDs were conducted with rural residents, with particular attention to women, youth, elderly persons, and persons with disabilities. This method allowed participants to collectively reflect on transport experiences, social impacts, and coping mechanisms. Group interaction helped reveal shared challenges and community-level dynamics.

iv. Field Observations:

Direct observations were undertaken to assess road conditions, transport facilities, vehicle types and conditions, and service operations. This method provided independent verification of survey and interview findings, strengthening the credibility of the study through practical confirmation.

Research assistants were trained prior to fieldwork on study objectives, instruments, digital data collection (ODK), and research ethics to ensure consistency and data quality. Formal authorization for data collection was obtained through LATRA and relevant government authorities.

5.4.1 Data Collection Instruments

To operationalize the selected data collection methods, structured and semi-structured research instruments were developed and aligned with the study objectives.



i. Household Survey Questionnaire

A structured questionnaire was developed for the quantitative survey. The tool contained both closed-ended and limited open-ended questions organized into the following sections:

- Household demographic characteristics
- Road type and connectivity
- Transport availability and frequency
- Travel time and transport costs
- Reliability and seasonal accessibility
- Safety and accident exposure
- Impacts on income, education, healthcare, and social participation

The questionnaire was designed to generate measurable indicators corresponding to the conceptual framework variables (infrastructure condition, service characteristics, accessibility, and socio-economic outcomes).

ii. Key Informant Interview (KII) Guide

A semi-structured interview guide was prepared for institutional and service-level respondents. The guide included thematic sections on:

- Transport infrastructure status and maintenance
- Regulatory frameworks and enforcement
- Service coverage and operational constraints
- Seasonal disruptions and resilience
- Institutional coordination
- Policy implementation gaps

The semi-structured format allowed probing and clarification while ensuring consistency across districts.

iii. Focus Group Discussion (FGD) Guide

A structured discussion guide was developed to facilitate community-level discussions. Key themes included:

- Daily mobility patterns
- Seasonal transport challenges



- Affordability and coping strategies
- Gender and vulnerability considerations
- Social and economic impacts
- Community-level recommendations

The guide encouraged participatory dialogue while maintaining alignment with research objectives.

iv. Observation Checklist

A structured observation checklist was used to systematically record:

- Road surface type (bitumen, gravel, earth)
- Physical condition (potholes, erosion, drainage, passability)
- Transport facilities (bus stops, signage, loading points)
- Vehicle types and operational conditions
- Evidence of seasonal damage

This instrument ensured objective verification of reported transport conditions.

All instruments were initially developed in English, translated into Kiswahili, pre-tested in a pilot setting, and refined accordingly. Final tools were digitized using ODK-based tablet data collection for the quantitative survey, while qualitative interviews were audio-recorded (with consent) and transcribed for analysis.

5.5 Data Management and Analysis

5.5.1 Quantitative Data Analysis

Quantitative data were exported from ODK into STATA (Version 15) for cleaning and analysis. Data management procedures included range checks, consistency checks, validation of skip patterns, treatment of missing values, and removal of incomplete or duplicate records.

Analysis was conducted in four stages:

i. Descriptive Analysis

Descriptive statistics were generated to summarize key variables, including means, medians, standard deviations, and proportions. Frequency distributions were used to describe road types, transport availability, service frequency, affordability levels, travel time, and seasonal accessibility. Results were disaggregated by district, gender, and vulnerability status where relevant.

ii. Cross-Tabulation and Association Testing



Cross-tabulations were performed to examine relationships between transport variables and socio-economic characteristics (e.g., income level, occupation, gender, disability status). Pearson's Chi-square tests were used to assess statistical significance for categorical variables, while t-tests and ANOVA were applied where appropriate for continuous variables. A significance level of 5% ($p < 0.05$) was adopted.

iii. Composite Indicator Construction

Indices were constructed to measure:

- Transport Reliability
- Accessibility Constraints
- Affordability Burden

These composite indicators were developed using standardized variables to capture multidimensional transport conditions.

iv. Inferential Analysis

Inferential analysis was conducted using ordered logistic regression models to examine how the availability and accessibility of land transport services influence healthcare access, economic opportunities, education access, and social connectivity in rural communities. The analysis used variables drawn directly from the Household Survey questionnaire, where each variable corresponds to specific indicators used in the survey instrument. For each outcome area, a dependent variable was defined and transport-related indicators were included as explanatory variables.

a) Healthcare Access Model

The dependent variable captures whether a household member was unable to access healthcare services in the past 12 months due to transport-related constraints. This variable reflects the extent to which transport barriers limit timely access to healthcare within rural households. The analysis includes key transport-related explanatory variables: road type connecting the village to the nearest service center, the overall condition of the main road, year-round road accessibility, availability of public transport services, and travel time to the nearest health facility. These variables represent both infrastructure quality and practical accessibility conditions that may influence healthcare access. An ordered logistic regression model was applied using a cumulative logit specification, which models the log-odds of being in a lower category of healthcare access as a function of transport conditions. This approach is appropriate for ordered outcome variables, where responses follow a ranked structure.

The model is expressed as:

$$\ln \left(\frac{P(Y \leq j)}{P(Y > j)} \right) = \alpha_j - (\beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4)$$



Where:

- Y represents healthcare access outcome (ordered categories)
- X_1 = road type
- X_2 = road condition
- X_3 = year-round accessibility
- X_4 = availability of public transport

Substituting the estimated coefficients:

$$\ln \left(\frac{P(Y \leq j)}{P(Y > j)} \right) = \alpha_j - (-0.396X_1 - 0.361X_2 - 0.377X_3 - 0.025X_4)$$

This model estimates how transport conditions influence the likelihood of households experiencing barriers to healthcare access, with negative coefficients indicating that improvements in transport conditions reduce the probability of restricted access.

(b) Economic Opportunities Model

The dependent variable measures how transport availability influences household income outcomes, capturing whether income opportunities have improved, remained unchanged, or declined. This reflects the broader economic impact of transport accessibility on rural livelihoods. The analysis incorporates key transport-related factors, including road type, road condition, availability of public transport services, travel time to the nearest major market, and seasonal changes in transport fares. These variables represent both infrastructure quality and cost-related constraints affecting market participation and income generation. An ordered logistic regression model was applied using a cumulative logit specification, appropriate for modeling ordered outcome variables. This approach estimates the log-odds of a household falling into a lower income opportunity category as a function of transport conditions.

The model is expressed as:

$$\ln \left(\frac{P(Y \leq j)}{P(Y > j)} \right) = \alpha_j - (\beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5)$$

Where:

- Y represents household income opportunity outcome (ordered categories)
- X_1 = road type
- X_2 = road condition



- X_3 = availability of public transport
- X_4 = travel time to the nearest major market
- X_5 = seasonal increase in transport fares

Substituting the estimated coefficients:

$$\ln \left(\frac{P(Y \leq j)}{P(Y > j)} \right) = \alpha_j - (0.273X_1 + 0.080X_2 - 0.027X_3 - 0.098X_4 - 0.688X_5)$$

This model evaluates how transport conditions shape household economic outcomes, with negative coefficients indicating factors that reduce income opportunities and positive coefficients indicating factors that support improved economic access.

(c) Education Access Model

The dependent variable measures whether household members missed school, work, or essential services due to transport constraints within the past 12 months. In this analysis, it is used as an indicator of transport-related barriers affecting education access, particularly school attendance. The model includes key transport-related explanatory variables: road type connecting the village to the nearest town, overall road condition near the household, year-round road accessibility, availability of public transport services, and travel time for children to reach school. These variables capture both infrastructure quality and practical accessibility factors influencing educational participation. An ordered logistic regression model was applied using a cumulative logit specification, which is suitable for analyzing ordered outcomes. This approach estimates the log-odds of households falling into a lower education access category as a function of transport conditions.

The model is expressed as:

$$\ln \left(\frac{P(Y \leq j)}{P(Y > j)} \right) = \alpha_j - (\beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5)$$

Where:

- Y represents education access outcome (ordered categories)
- X_1 = road type
- X_2 = road condition
- X_3 = year-round accessibility
- X_4 = availability of public transport
- X_5 = travel time to school



Substituting the estimated coefficients:

$$\ln \left(\frac{P(Y \leq j)}{P(Y > j)} \right) = \alpha_j - (-0.345X_1 - 0.023X_2 + 0.143X_3 + 0.143X_4 - 0.522X_5)$$

This model evaluates how transport conditions influence the likelihood of missed schooling, with results indicating that travel time plays a critical role in shaping education access outcomes.

(d) Social Connectivity Model

The dependent variable measures whether household members miss community events such as meetings, funerals, or ceremonies due to transport constraints. This variable reflects the extent to which transport accessibility influences participation in social and community activities. The analysis incorporates key transport-related factors, including road type, road condition, availability of public transport services, frequency of transport unavailability, and frequency of visits to neighboring villages or towns. These variables capture both infrastructure conditions and service reliability that shape social interaction in rural areas. An ordered logistic regression model was applied using a cumulative logit (proportional odds) specification, which is appropriate for modeling ordered outcomes and estimates the log-odds of falling into lower levels of social participation.

The model is expressed as:

$$\ln \left(\frac{P(Y \leq j)}{P(Y > j)} \right) = \alpha_j - (\beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5)$$

Where:

- Y represents social connectivity outcome (ordered categories)
- X_1 = road type
- X_2 = road condition
- X_3 = availability of public transport
- X_4 = frequency of transport unavailability
- X_5 = frequency of visits to neighboring villages

Substituting the estimated coefficients:

$$\ln \left(\frac{P(Y \leq j)}{P(Y > j)} \right) = \alpha_j - (-0.425X_1 - 0.120X_2 + 0.241X_3 - 0.269X_4 + 0.142X_5)$$

This model evaluates how transport availability and reliability influence social participation, with results indicating that access to transport services and their consistency play a key role in enabling community engagement.



5.5.2 Qualitative Data Analysis

Qualitative data were analyzed using NVivo software. Audio recordings were transcribed verbatim and translated where necessary. A coding framework was developed based on the study objectives and conceptual framework.

Analysis followed a thematic approach:

1. Initial open coding
2. Axial coding to identify relationships between themes
3. Cross-district comparison
4. Integration with quantitative findings

Key themes included transport accessibility, seasonal disruptions, affordability, safety concerns, institutional challenges, and impacts on livelihoods and service access.

5.5.3 Integration and Triangulation

Findings from quantitative and qualitative analyses were integrated during interpretation. Quantitative results identified patterns and magnitudes of transport challenges, while qualitative evidence provided contextual explanations and institutional insights. This triangulation enhanced validity, strengthened analytical rigor, and supported evidence-based policy recommendations.

5.6 Recruitment and Training of Research Assistants

A total of 12 Research Assistants were recruited based on academic qualifications and prior research experience. Priority was given to candidates from the study regions. A two-day training covered study objectives, sampling procedures, data collection tools, research ethics, and pre-testing of instruments.

5.7 Ensuring Permission for Data Collection

Formal authorization for data collection was obtained through LATRA, which issued introductory letters to Regional Administrative Secretaries. These facilitated district- and community-level approvals, ensuring compliance with national regulations and smooth field implementation.

5.8 Ethical Considerations

Ethical principles guided all stages of the study. Participation was voluntary, informed consent was obtained, and confidentiality was strictly maintained. Data were anonymized and securely stored. Special care was taken to ensure respectful and inclusive engagement with vulnerable groups. All research activities complied with institutional and national ethical standards.



6. Findings and Results

6.1 Assessment of Current Rural Transport Infrastructure

6.1.1 Understand the condition and usability of rural roads.

Understanding the condition and usability of rural roads is essential for assessing how effectively rural areas are connected to nearby towns, markets, and services. Road condition influences year-round accessibility, travel time, transport costs, and the reliability of transport services, especially during rainy seasons. Poor or low-standard roads limit the movement of people and goods, disrupt access to health and education services, and constrain economic activities. The assessment therefore focuses on the physical state of roads and their practical usability by common means of transport under normal and adverse weather conditions.

6.1.1.1 Main type of road connecting villages to the nearest town

This subsection presents the main type of road connecting villages to the nearest town based on household survey responses, disaggregated at the district level. Road types are classified in line with TANROADS and TARURA standards into paved (bitumen), gravel, and earth roads, with an additional category for areas lacking formal road access (footpaths only). This classification provides insight into the quality and reliability of rural transport infrastructure and its implications for year-round accessibility.

Table 2: Main Type of Road Connecting Villages to the Nearest Town

District	Paved (Tarmac) (%)	Graveled (%)	Dirt/Earth Road (%)	No Road Access (%)	Total (%)
Kiteto	0	46	12.5	0	16.6
Liwale	16.7	10.8	14.2	0	13.7
Mlimba	0	5.4	35.6	100	31.1
Mpimbwe	66.7	21.6	6.9	0	10.1
Serengeti	16.7	16.2	30.9	0	28.5
Total	100	100	100	100	100

The findings in table 2 show clear disparities in road infrastructure across districts, with a strong overall reliance on lower-quality road types. Earth roads emerge as the most dominant form of connectivity, particularly in Mlimba (35.6%) and Serengeti (30.9%), indicating that a large proportion of households depend on road surfaces that are highly vulnerable to weather conditions, especially during the rainy season. This has direct implications for transport reliability, travel time, and access to essential services. Gravel roads, which represent a moderate level of infrastructure development, are most prevalent in Kiteto (45.9%), suggesting relatively better road conditions compared to other districts, although still below all-weather



standards. In contrast, Mlimba (5.4%) and Liwale (10.8%) report limited gravel road coverage, reinforcing the dominance of weaker road types in these areas.

Access to paved (tarmac) roads considered the most reliable and durable under national standards is heavily concentrated in Mpimbwe (66.7%), making it the only district with substantial connectivity to high-standard roads. Liwale and Serengeti report modest access (16.7% each), while Kiteto and Mlimba show no direct household access to paved roads, highlighting significant infrastructure gaps. A particularly notable finding is that all reported cases of no formal road access (footpath only) are concentrated in Mlimba, indicating that some communities remain entirely disconnected from the formal road network. This level of isolation suggests severe constraints on mobility, especially for emergency services, trade, and access to education and healthcare. Overall, the distribution underscores a rural transport landscape that is still largely dependent on earth and gravel roads, with limited reach of paved infrastructure. This imbalance points to persistent challenges in achieving reliable, year-round connectivity, particularly in districts like Mlimba and Serengeti, where road conditions are both poor and highly susceptible to seasonal disruption.

Predominance of Earth Roads and Structural Vulnerability

Across all study regions, stakeholder narratives consistently identified earth roads as the primary means of connection between villages and nearby towns. These road types were repeatedly associated with fragility, rapid deterioration, and seasonal isolation. Community representatives and district-level officials alike noted that paved or engineered gravel roads remain extremely limited outside town centers.

One local government official from Morogoro Region described the structural nature of the challenge:

“All the district roads here are earth roads. During the rainy season, vehicles get stuck and pregnant women give birth on the road.” — Local Government Official, Morogoro Region

Similarly, a district-level transport authority representative from Manyara Region highlighted the imbalance in road composition:

“Paved roads are about 4 kilometers, gravel around 279 kilometers, and earth roads exceed 1,000 kilometers.” — Transport Authority Representative, Manyara Region

Participants from Mara and Katavi Regions echoed similar observations, often describing roads labeled as “gravel” that in practice function as loosely compacted earth surfaces rather than engineered all-weather gravel roads. The predominance of earth roads reflects a structural deficit in rural connectivity. While these roads may function during dry seasons, their vulnerability to rainfall results in predictable disruptions. The evidence suggests that rural transport constraints are primarily infrastructure-driven, with road quality and resilience shaping downstream challenges related to access, affordability, and safety.



6.1.1.2 Rating of the Overall Condition of the Main Road Near the Household

This subsection presents households' perceptions of the overall condition of the main road near their residence, based on responses from the household survey. Road condition is an important factor influencing transport reliability, travel time, and access to services, especially in rural areas.

Table 3: Rating of the Overall Condition of the Main Road Near the Household by District

District	Very Good (%)	Fair (%)	Poor (%)	Very Poor (%)	Total (%)
Kiteto	50	52	20.3	2.1	16.6
Liwale	0	2	21.5	13.7	13.7
Mlimba	0	6	38	36.3	31.1
Mpimbwe	50	24	13.9	2.7	10.1
Serengeti	0	16	6.3	45.2	28.5
Total	100	100	100	100	100

The findings in table 3 show that road conditions are largely poor or very poor across most districts. Very poor ratings are highest in Serengeti (45.2%) and Mlimba (36.3%), indicating serious road deterioration. Poor conditions are also common in Mlimba (38.0%) and Liwale (21.5%), reinforcing the widespread challenges in road quality. In contrast, fair road conditions are most frequently reported in Kiteto (52.0%), suggesting relatively better usability. Some households in Kiteto and Mpimbwe (50.0% each) rated roads as very good, though these cases are fewer compared to poor ratings overall. Overall, the results indicate that most rural households face weak road conditions, which likely affect transport efficiency, increase travel time, and limit access to markets and essential services.

Roads Rated as Poor to Very Poor

Participants across focus group discussions and key informant interviews consistently rated the condition of main access roads near households as poor or very poor, particularly in Morogoro and Mara regions. In Katavi, road conditions were described as relatively functional near administrative centers but deteriorating significantly toward remote settlements.

A community member from Morogoro Region described prolonged immobilization during the rainy season:

“When it rains, vehicles can be stuck for up to three days. Transport fares rise from 10,000 to 30,000 shillings.” — FGD Participant, Morogoro Region

In Mara Region, participants characterized road deterioration as a long-standing issue:



“No road has been repaired for about ten years. Bridges are eroded and people lose their lives because they cannot reach services.” — FGD Participant, Mara Region

Youth participants from Katavi Region emphasized time-related impacts rather than complete inaccessibility:

“The journey that used to take two and a half hours now takes almost four hours because of potholes and breakdowns.” — Youth Participant, Katavi Region

The consistently low rating of road condition suggests chronic under-maintenance rather than isolated infrastructure failure. Even where roads remain technically passable, degraded surfaces substantially increase travel time, costs, and safety risks. These findings reinforce that physical pass ability alone does not equate to functional accessibility in rural transport systems.

6.1.1.3 Year-Round Accessibility of Roads in the Village

This subsection examines whether roads in surveyed villages are accessible throughout the year, based on household responses. Year-round access reflects the reliability of rural transport and the ability to reach key services.

Table 4: Year-Round Accessibility of Roads in the Village by District

District	Yes, always (%)	Dry season only (%)	Rarely accessible (%)	Never accessible (%)	Total (%)
Kiteto	35.3	17.1	13.6	0	16.6
Liwale	27.5	3.4	32.2	2	13.7
Mlimba	0	35	10.2	78	31.1
Mpimbwe	27.5	10.3	3.4	0	10.1
Serengeti	9.8	34.2	40.7	20	28.5
Total	100	100	100	100	100

The results in table 4 show that year-round accessibility is limited in several districts. Higher shares of roads that are always accessible are found in Kiteto (35.3%), followed by Liwale and Mpimbwe (27.5% each), while Mlimba reports none. Roads accessible only during the dry season are common in Mlimba (35.0%) and Serengeti (34.2%), showing strong seasonal dependence. Reports of rarely accessible roads are highest in Serengeti (40.7%) and Liwale (32.2%), indicating frequent disruptions. Mlimba stands out with 78.0% of roads reported as never accessible, pointing to severe access challenges. Overall, many households face seasonal or persistent road access problems, confirming that rural mobility is heavily affected by weather and road conditions.

Seasonal Isolation as a Norm



Year-round accessibility emerged as one of the most critical weaknesses of rural road infrastructure. Roads that function during the dry season routinely become impassable in the rainy season due to flooding, mud, and erosion.

Women participants from Lindi Region described how even light rainfall can trigger road failure:

“If it rains once or twice, the roads become very slippery and vehicles cannot pass.” — FGD Participant, Lindi Region

Youth participants from Morogoro Region highlighted the role of topography in road damage:

“Water from the mountains destroys the roads and washes them away because they were not built to standard.” — Youth Participant, Morogoro Region

A local administrative representative from Katavi Region confirmed that remote settlements experience near-total seasonal isolation:

“During the rainy season, mud makes roads impassable and only motorcycles can attempt to pass.” — Local Government Representative, Katavi Region

The absence of reliable year-round accessibility reflects structural design limitations, including inadequate drainage and limited climate-resilient engineering. Seasonal isolation is therefore not accidental but predictable, resulting in repeated disruptions to healthcare access, education continuity, and economic activities.

6.1.1.4 Availability of public transport services in the village

This subsection examines the availability and frequency of public transport services in villages based on household survey responses. Availability of such services reflects the ease with which households can travel to nearby towns, markets, and essential services.

Table 5: Availability of Public Transport Services in the Village by District

District	Regular service (%)	Occasional service (%)	Used to exist (%)	Never existed (%)	Total (%)
Kiteto	12.5	15.7	8.3	22.3	16.6
Liwale	23.8	4.3	29.2	8.7	13.7
Mlimba	5	58.6	16.7	35.9	31.1
Mpimbwe	11.3	4.3	8.3	13.6	10.1
Serengeti	47.5	17.1	37.5	19.4	28.5



District	Regular service (%)	Occasional service (%)	Used to exist (%)	Never existed (%)	Total (%)
Total	100	100	100	100	100

The findings table 5 show clear differences across districts. Regular public transport services are most common in Serengeti (47.5%) and Liwale (23.8%), indicating relatively better service availability in these areas. In contrast, Mlimba reports the lowest level of regular service (5.0%), suggesting limited consistent transport options. Occasional services are highest in Mlimba (58.6%), showing that transport in this district is irregular and often depends on limited schedules or demand. A notable share of households reported that transport used to exist but is no longer available, especially in Serengeti (37.5%) and Liwale (29.2%), pointing to a decline in services over time. In addition, a significant proportion of households indicated that public transport has never existed, particularly in Mlimba (35.9%) and Kiteto (22.3%), highlighting areas that remain underserved. Overall, while some villages have access to transport, regular and reliable public transport remains limited, with many households depending on occasional services or lacking formal transport options altogether.

Sparse, Seasonal, and Spatially Unequal Services

Public transport availability was widely described as limited and unreliable, with pronounced disparities between administrative centers and more remote settlements. Motorcycles dominate rural mobility, while buses and minibuses operate only on selected routes and often suspend services during the rainy season.

A district-level official from Morogoro Region summarized the modal imbalance:

“About 80 percent of transport in rural areas is provided by motorcycles. Buses operate mainly on main routes and drop significantly during rains.” — Interview respondent, Morogoro Region

In Katavi Region, local leadership emphasized inequalities within wards:

“In more remote settlements, there is no formal transport. People depend on bodaboda to reach central points.” — Interview respondent, Katavi Region

Participants from Mara Region further highlighted temporal gaps, particularly at night and during emergencies. Public transport in rural areas was described as functioning more as an intermittent service than a guaranteed utility. Its availability is influenced by road conditions, commercial viability, and seasonality, leaving many residents effectively underserved despite the nominal presence of transport operators.

6.1.1.5 Commonly used Transport means in the community

This subsection identifies the main transport means used by community members, based on responses from the Household Survey. Transport means choice reflects road conditions, affordability, availability of services, and distance to key destinations.

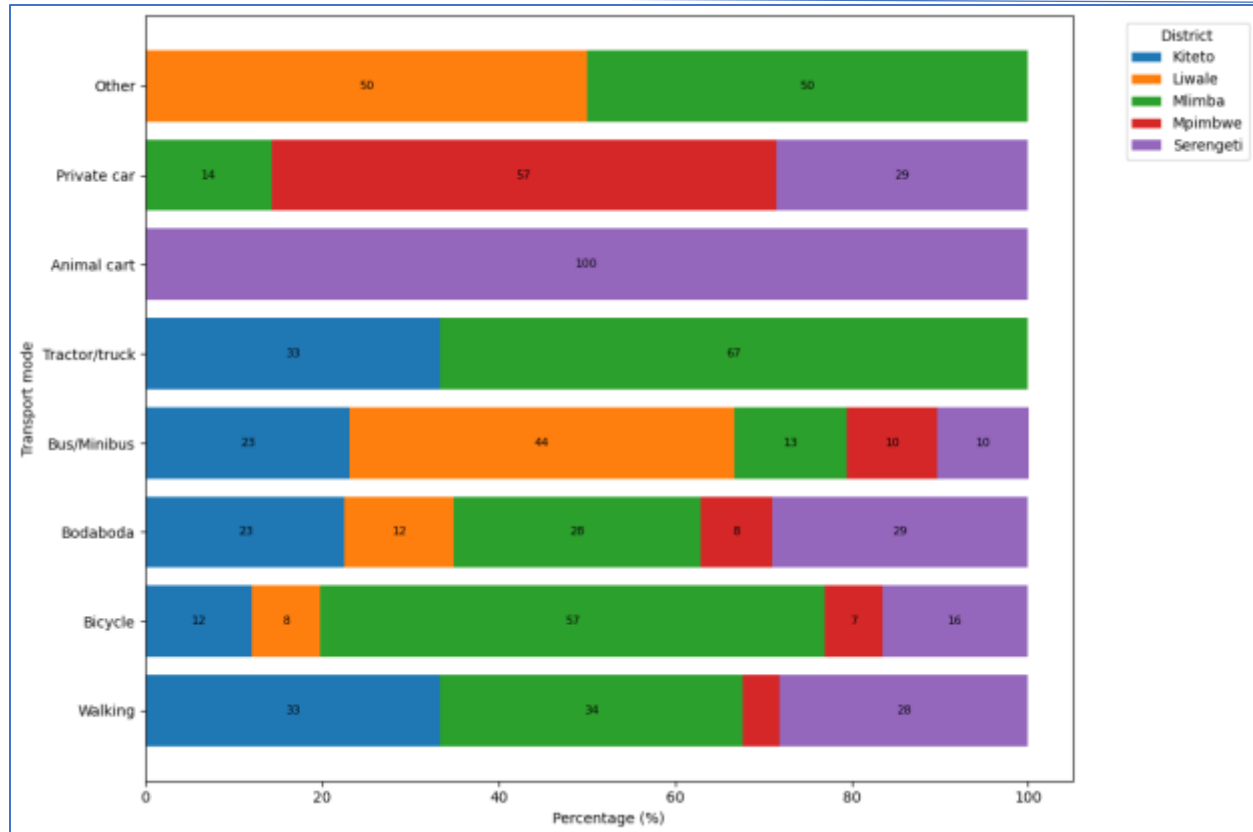


Figure 1: Common Transport Means Used in the Community

Figure 1 show that bodaboda (motorcycle taxis) are the most commonly used transport means across the study areas, accounting for the largest share of responses (34.35%). This reflects their flexibility, affordability, and ability to operate on poor and seasonal roads. Evidence from rural transport studies in Tanzania confirms that motorcycle taxis are widely used and often serve as the primary mode of transport for daily mobility in rural areas. Non-motorized transport also plays a significant role. Walking (22.35%) and bicycles (11.29%) are widely used, particularly for short-distance travel and in areas with limited access to motorized transport. The continued reliance on walking suggests both proximity of some services and constraints in transport availability. The use of buses or minibuses (11.29%) is relatively limited overall, although it is more prominent in certain areas such as Liwale. This indicates that formal public transport services are unevenly distributed and tend to operate mainly along accessible routes. Other transport means are less common and tend to be location-specific. Private or hired cars (7.76%) are concentrated in Mpimbwe and Serengeti, while tractors or trucks are more evident in Mlimba, reflecting their role in agricultural activities. Animal-drawn carts appear only in isolated cases and are not widely used. Overall, the findings indicate a strong reliance on motorcycle-based and informal transport systems, supported by walking and other low-cost options. This pattern reflects underlying challenges in rural road conditions and the limited reach of formal transport services.

Walking and Motorcycles as Default Mobility



Across all study areas, the most commonly used means of transport were walking, bicycles, and motorcycle taxis (bodaboda). Motor tricycles and tuk-tuk services were viewed positively where available but remained limited due to road constraints and low service coverage.

A participant with a disability from Katavi Region described everyday mobility realities:

“Most of the time I walk. If it is urgent, I use a boda-boda, but it is expensive and not suitable for people like us.” — FGD Participant (Person with Disability), Katavi Region

A local administrative representative from Manyara Region confirmed the lack of vehicle-based alternatives in certain areas:

“To reach other villages, you must use a motorcycle. There are no vehicles.” — Interview respondent, Manyara Region

The predominance of motorcycles and walking reflects adaptive coping rather than optimal mobility. These means persist not necessarily by preference, but because prevailing road conditions and limited-service availability restrict access to safer, more reliable, and more inclusive transport options.

6.1.1.6 Travel time to the nearest health facility

This subsection presents the time households take to reach the nearest health facility, based on survey responses. Travel time is a key indicator of access to healthcare and is influenced by distance, road conditions, and availability of transport services.

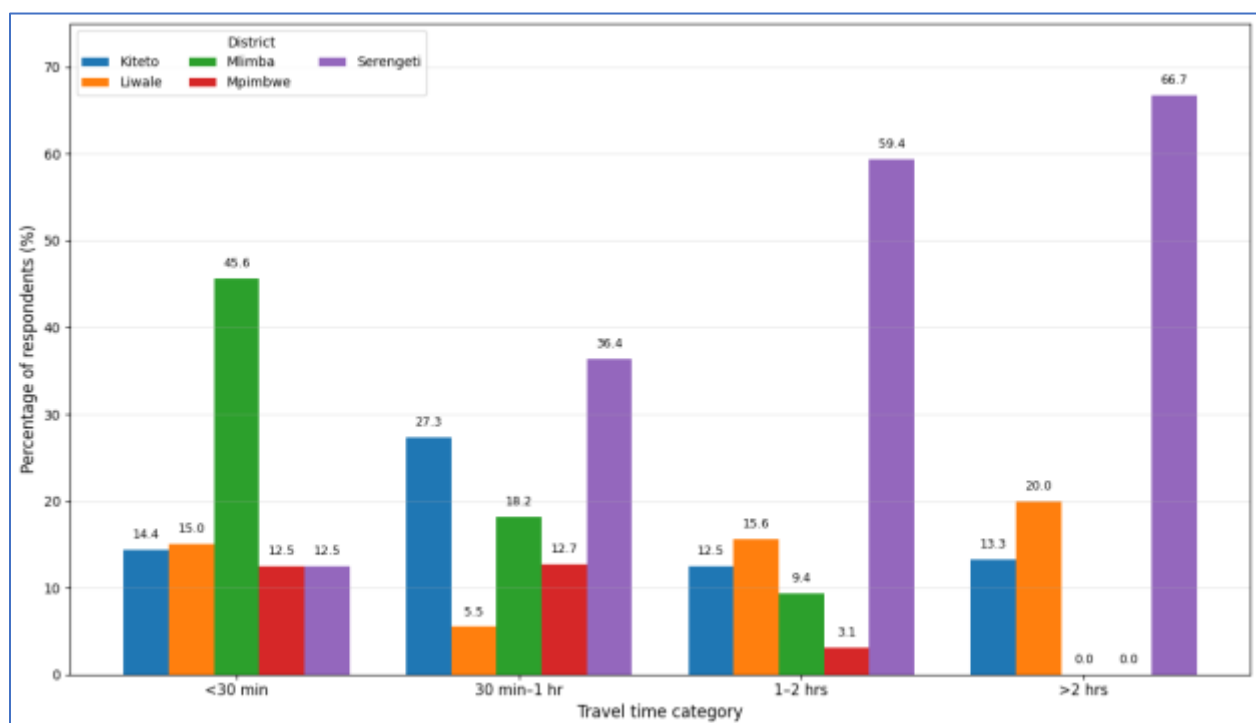


Figure 2: Time Taken to Reach the Nearest Health Facility



The results in figure 2 show clear variation in travel time across districts. Mlimba (45.6%) has the highest proportion of households reaching health facilities in less than 30 minutes, suggesting relatively better proximity or access in some areas. In contrast, Serengeti records the longest travel times, with a large share of households taking 1–2 hours (59.4%) and over 2 hours (66.7%), indicating serious accessibility challenges. Liwale also shows significant delays, with 20.0% of households reporting travel times of over 2 hours, reflecting limited access to nearby facilities. Meanwhile, Kiteto and Mpimbwe show more moderate travel patterns, with many households reaching health services within one hour. Overall, the findings suggest that a considerable number of households especially in Serengeti and Liwale face long and difficult journeys to access healthcare, highlighting ongoing challenges related to distance, road conditions, and transport availability.

Time Highly Variable and Cost-Dependent

Reported travel time to health facilities varied significantly depending on season, road condition, and ability to pay for transport. Although some facilities were geographically close, effective access was often delayed or prevented by transport constraints.

A participant from Katavi Region observed that short travel times were possible only under favorable conditions:

“It can take about 30 minutes to reach the health center, but only if transport is available.” — FGD Participant, Katavi Region

In contrast, a participant with a disability from Manyara Region described the high financial burden associated with emergency travel during poor road conditions:

“You may have to hire a private car for 100,000 to 200,000 shillings when roads are bad.” — FGD Participant (Person with Disability), Manyara Region

These accounts illustrate that travel time to health facilities is not a fixed measure but a contingent outcome shaped by affordability, infrastructure condition, and service availability. Such variability can lead to critical delays, particularly in emergencies and maternal health situations.

6.1.1.7 Travel time to the nearest major market

This subsection examines the time households take to reach the nearest major market where they buy or sell goods, based on survey responses. Travel time is an important indicator of economic accessibility and reflects both distance and the condition of transport infrastructure.

Table 6: Time Taken to Reach the Nearest Major Market

District	<30 min (%)	30 min–1 hr (%)	1–2 hrs (%)	>2 hrs (%)	Total (%)
Kiteto	12.6	41.9	8.3	13.3	16.6



District	<30 min (%)	30 min–1 hr (%)	1–2 hrs (%)	>2 hrs (%)	Total (%)
Liwale	15.9	7	8.3	20	13.7
Mlimba	43.7	4.7	5.6	13.3	31.1
Mpimbwe	13.7	4.7	0	6.7	10.1
Serengeti	14.2	41.9	77.8	46.7	28.5
Total	100	100	100	100	100

The findings in table 6 show variation in market accessibility across districts. Mlimba (43.7%) has the highest proportion of households reaching markets in less than 30 minutes, suggesting relatively closer market access for many households. In contrast, Serengeti records significantly longer travel times, with large shares of households taking 1–2 hours (77.8%) and over 2 hours (46.7%), indicating serious distance and transport constraints. Kiteto also shows moderate delays, with many households taking 30 minutes to 1 hour (41.9%), while Liwale reports a notable share (20.0%) traveling more than 2 hours, reflecting limited access in some areas. Meanwhile, Mpimbwe shows relatively shorter travel times overall, with fewer households reporting long-distance travel. Overall, while some households are located close to markets, a considerable proportion still face long travel times, which can increase transport costs, reduce trading opportunities, and limit participation in local markets.

Proximity Does Not Guarantee Access

Although markets were often located closer to households than health facilities, transport constraints continued to shape effective access, particularly for the movement of goods rather than people.

A participant from Katavi Region noted that market access by foot was manageable under normal conditions:

“It takes about 25 minutes to reach the market by walking.” — FGD Participant, Katavi Region

However, participants from Mara and Morogoro Regions emphasized that damaged bridges, seasonal river crossings, and disrupted feeder routes frequently interrupted market access during the rainy season. These disruptions increased transport costs, delayed trade, and contributed to post-harvest losses. These findings suggest that market access is constrained less by physical distance and more by the reliability of transport linkages. Even short travel distances can become costly or inaccessible when critical connectors within the transport chain fail.

6.1.1.8 Distance to the nearest all-weather road

This subsection examines how far households are located from the nearest all-weather road, based on household survey responses. Distance to an all-weather road is an important indicator of reliable connectivity, as these roads remain usable throughout the year regardless of weather conditions.

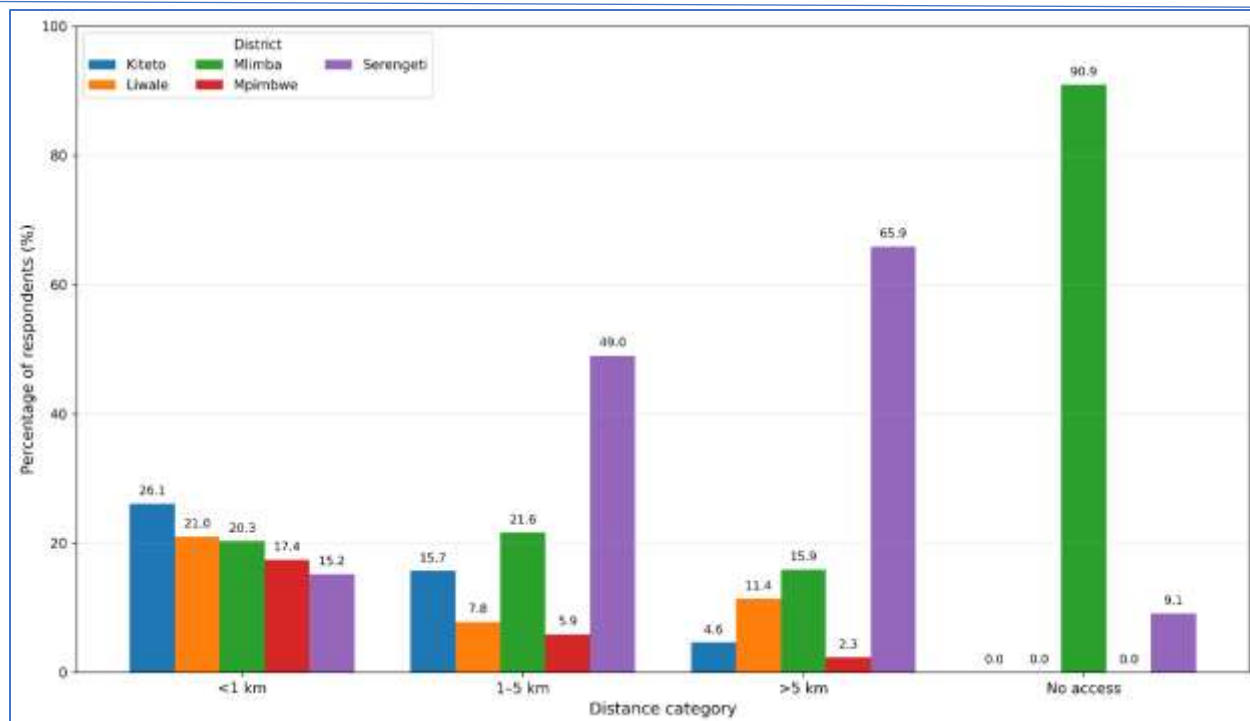


Figure 3 Approximate Distance to the Nearest All-Weather Road

The findings in figure 3 show noticeable differences in access to all-weather roads across districts. A moderate share of households is located within 1 km, particularly in Kiteto (26.1%) and Liwale (21.0%), suggesting relatively closer proximity to reliable roads in these areas. However, many households are located farther away. Serengeti records the highest proportions at longer distances, especially over 5 km (65.9%) and 1–5 km (49.0%), indicating significant distance-related barriers to reliable road access. Mlimba stands out with a very high share (90.9%) reporting no access to all-weather roads, highlighting serious connectivity challenges. It also shows notable shares in both the 1–5 km and over 5 km categories, reinforcing the extent of limited access. Overall, the results indicate that a large proportion of households are either far from all-weather roads or lack access entirely. This suggests continued reliance on seasonal or lower-standard roads, which can reduce transport reliability and accessibility, particularly during the rainy season.

All-Weather Roads Concentrated Near Towns

Participants consistently distinguished between paved roads located in town centers and the more vulnerable access roads serving rural settlements. All-weather roads were generally concentrated in urban areas or along major corridors, while village and feeder roads remained largely unpaved and seasonally fragile.

A district-level transport official from Manyara Region described this spatial divide:

“In town, roads are paved, but village and internal roads face seasonal challenges and potholes.” — Interview respondent, Manyara Region



Participants from Morogoro and Katavi Regions similarly described asphalt roads as distant but aspirational infrastructure, often referencing major corridor routes as the nearest reliable links.

Distance from all-weather roads therefore represents more than geographic separation; it reflects unequal infrastructure resilience. Communities located farther from paved corridors face heightened vulnerability during rainy seasons, reinforcing spatial inequities in access to services and markets.

6.1.1.9 Road signs, markings, and safety indicators in rural areas

This subsection assesses the presence of road signs, markings, and safety indicators based on household survey responses. These features are important for ensuring safe movement of pedestrians, cyclists, and vehicles.

Table 7: Presence of Road Signs, Markings, and Safety Indicators

District	Adequate (%)	Some, not adequate (%)	None (%)	Not sure (%)	Total (%)
Kiteto	28.6	19.7	12.1	35.7	16.6
Liwale	28.6	8.2	13.8	7.1	13.7
Mlimba	14.3	37.7	32.8	14.3	31.1
Mpimbwe	17.9	24.6	4.6	0	10.1
Serengeti	10.7	9.8	36.8	42.9	28.5
Total	100	100	100	100	100

The findings in table 7 show that road safety features are generally limited across districts. A relatively higher share of households reporting adequate safety indicators is seen in Kiteto and Liwale (28.6% each), while other districts report lower levels. A significant proportion of households indicate that safety features exist but are not adequate, especially in Mlimba (37.7%) and Mpimbwe (24.6%), suggesting gaps in quality and coverage. Reports of no safety features at all are highest in Serengeti (36.8%) and Mlimba (32.8%), pointing to weak road safety infrastructure in these areas. Additionally, a notable share of respondents, particularly in Serengeti (42.9%) and Kiteto (35.7%), reported being unsure, which may reflect low visibility or awareness of such features. Overall, the results indicate that road signs, markings, and safety indicators are either lacking or insufficient in many rural areas, which may increase accident risks and reduce the safety and usability of roads.

Near Absence of Formal Road Safety Infrastructure

Across all regions, respondents consistently reported an almost complete absence of road signs, markings, and safety indicators in rural areas. Warning signs near schools, sharp bends, bridges, or livestock crossings



were rarely observed. This absence was frequently linked to accidents, particularly those involving motorcycles, children, and livestock.

A participant from Manyara Region described the risks faced by children and riders:

“There are no signs at all. Sharp turns and livestock crossings are everywhere, and accidents happen because drivers are not warned.” — FGD Participant, Manyara Region

Transport service providers from Katavi Region emphasized the operational risks associated with missing signage:

“You reach a flooded culvert without any warning. By the time you see it, it’s too late.” — Interview respondent, Katavi Region

Participants from Mara Region highlighted the lack of safety measures near social infrastructure:

“Schools and dispensaries have no signs. Vehicles pass fast because nothing tells them to slow down.” — Community Representative, Mara Region

The absence of road signage and safety infrastructure points to a broader gap in rural road safety planning. Roads are treated primarily as physical corridors rather than shared public spaces requiring protective measures. This shortfall disproportionately exposes pedestrians, children, and motorcycle users to risk, reinforcing rural–urban disparities in transport safety.

6.1.1.10 Availability of pedestrian walkways or footpaths in the village

This subsection examines the availability of pedestrian walkways or footpaths along village roads and key routes, based on household survey responses. Such infrastructure supports safe and convenient movement, especially where walking is common.

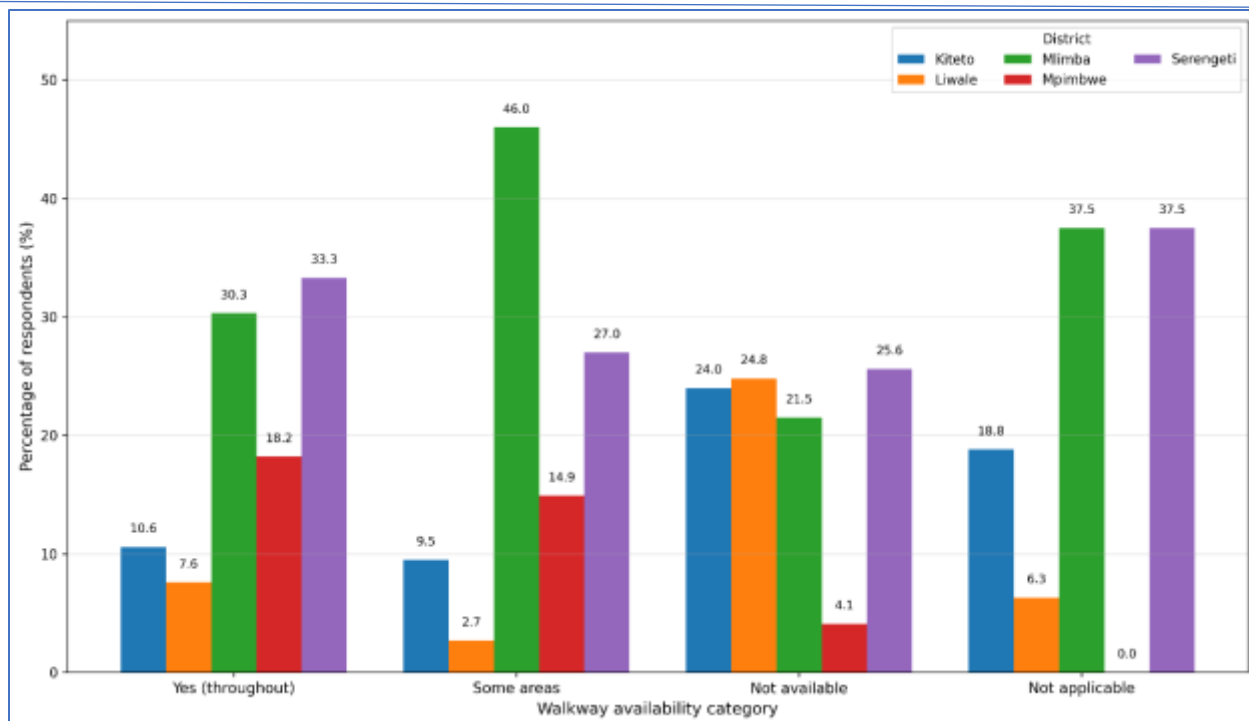


Figure 4: Availability of Pedestrian Walkways or Footpaths in the Village

The findings in figure 4 show uneven availability of pedestrian walkways across districts. Serengeti (33.3%) and Mlimba (30.3%) report higher availability throughout the village, while Kiteto (10.6%) and Liwale (7.6%) show limited coverage. A large share of households reports walkways available only in some areas, especially in Mlimba (46.0%) and Serengeti (27.0%), indicating partial infrastructure. At the same time, many households report that walkways are not available at all, particularly in Liwale (24.8%), Serengeti (25.6%), and Kiteto (24.0%). Overall, the results suggest that pedestrian infrastructure remains limited or incomplete in many villages, forcing residents to rely on informal paths or road edges, which may increase safety risks and reduce ease of movement.

Pedestrian Movement Integrated into Vehicle Lanes

Pedestrian walkways were largely absent across the study sites. Residents reported that walking commonly takes place directly on road surfaces, where pedestrians share space with motorcycles, bicycles, animal-drawn carts, and vehicles. In most villages, existing footpaths are informal and lack engineered protection or separation from motorized traffic.

A youth participant from Morogoro Region explained:

“There are no footpaths. Pedestrians and vehicles all use the same narrow road.” — FGD Participant, Morogoro Region

In Lindi Region, women highlighted the gendered safety risks of this arrangement:



“When it rains, the road becomes slippery and women carrying children must walk in the same path as motorcycles.” — FGD Participant, Lindi Region

Community representatives from Mara Region similarly observed that pedestrian needs are rarely integrated into road design:

“Roads are built for vehicles only. People are expected to adjust.” — Community Representative, Mara Region

The absence of designated pedestrian walkways compels unsafe sharing of road space, increasing accident risks and physical strain. This condition disproportionately affects women, children, elderly persons, and persons with disabilities, whose mobility options are already limited.

6.1.1.11 Frequency of motorized vehicle movement in the village

This subsection assesses how often motorized vehicles operate within villages, based on household survey responses. Motorized vehicles include motorcycles, tricycles, cars, vans, minibuses, buses, and trucks.

Table 8: Frequency of Motorized Vehicles Passing Through the Village

District	Many times/day (%)	Once daily (%)	Few times/week (%)	Rarely/never (%)	Total (%)
Kiteto	22.7	14.6	3.6	11.5	16.6
Liwale	23.4	2.4	0	3.9	13.7
Mlimba	9.7	48.8	71.4	42.3	31.1
Mpimbwe	13.6	7.3	5.4	3.9	10.1
Serengeti	30.5	26.8	19.6	38.5	28.5
Total	100	100	100	100	100

The results in table 8 show variation in the frequency of motorized vehicle movement across districts. Serengeti (30.5%), Liwale (23.4%), and Kiteto (22.7%) report higher shares of vehicles passing many times per day, indicating relatively active movement. In contrast, Mlimba shows lower daily frequency (9.7%), but a higher share of vehicles passing once daily (48.8%), suggesting more limited but regular movement. A notable proportion of households report vehicles passing only a few times a week or rarely, particularly in Mlimba (71.4% and 42.3%) and Serengeti (38.5%), indicating inconsistent transport flow in some areas. Overall, while some villages experience frequent vehicle movement, others still face irregular and limited motorized transport, likely influenced by road conditions and distance.

Irregular and Demand-Driven Vehicle Movement



Motorized vehicle movement in villages was widely described as infrequent and inconsistent, often determined by market days, weather conditions, and commercial viability. In many communities, vehicles do not operate on a daily schedule, and residents may wait hours or even days for transport.

A participant from Mara Region described the uncertainty surrounding daily mobility:

“You cannot plan. A vehicle may come today and not come tomorrow.” — FGD Participant, Mara Region

Youth participants from Katavi Region emphasized the dependency on passenger demand:

“Vehicles move only when they are full. If passengers are few, you wait.” — Youth Participant, Katavi Region

A district-level transport official from Mara Region acknowledged the pattern:

“Vehicle movement in villages depends on demand and road condition. It is not scheduled.” — Interview respondent, Mara Region

Irregular vehicle movement reduces the predictability and reliability of rural transport services. This unpredictability disrupts time-sensitive activities such as accessing healthcare, attending school, and participating in markets, reinforcing transport as a constraint rather than an enabling public service.

6.1.1.12 Maintenance status of the main access road to the village

This subsection examines when the main access road to the village was last graded or rehabilitated, based on household survey responses. Maintenance frequency reflects road condition, durability, and long-term usability.

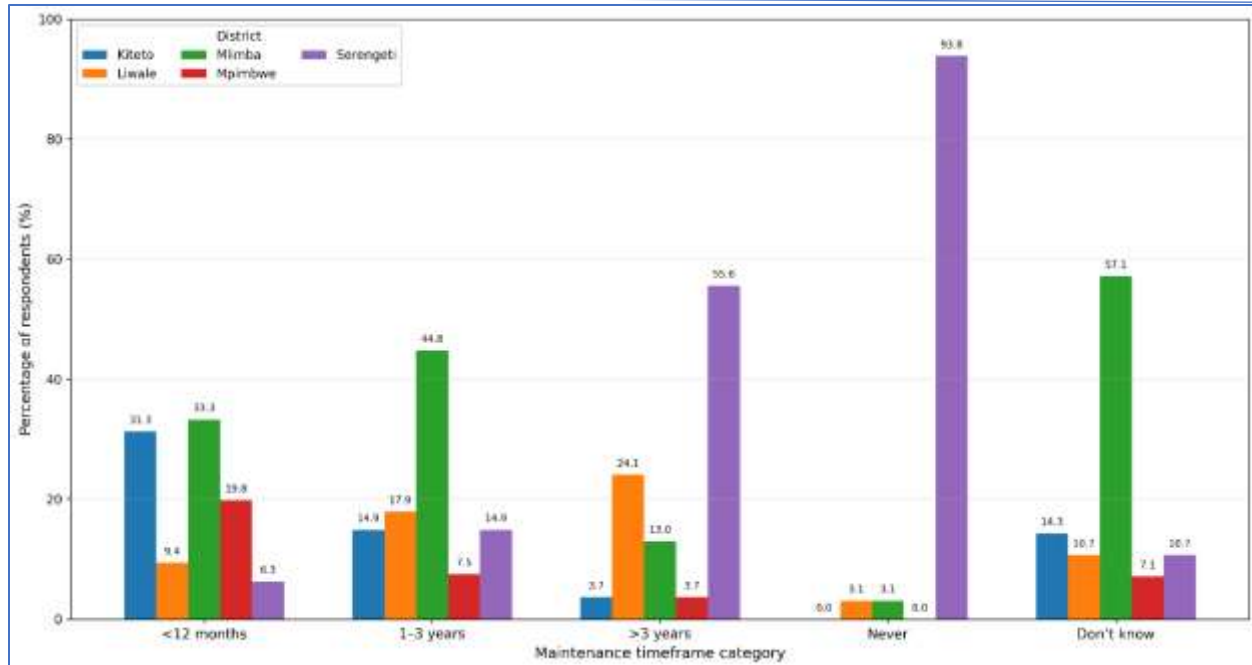


Figure 5: Time Since Last Grading or Rehabilitation of the Main Access Road

The findings figure 4 show uneven and often limited road maintenance across districts. Recent maintenance (within 12 months) is relatively higher in Mlimba (33.3%) and Kiteto (31.3%), suggesting some level of recent intervention in these areas. However, many households report maintenance occurring 1–3 years ago, particularly in Mlimba (44.8%), indicating gaps in regular upkeep. A significant share also report maintenance taking place more than 3 years ago, especially in Serengeti (55.6%) and Liwale (24.1%), reflecting long periods without road improvement. Notably, Serengeti records a very high proportion of roads reported as never maintained (93.8%), pointing to severe neglect in some areas. In addition, a considerable number of households, particularly in Mlimba (57.1%), reported that they do not know when maintenance last occurred, suggesting limited awareness or communication. Overall, the results indicate that maintenance of rural access roads is irregular and often infrequent, contributing to continued road deterioration and reduced usability over time.

Reactive and Insufficient Maintenance

Maintenance of main access roads was widely described as reactive, temporary, and inadequate. Respondents reported that repairs typically occur only after significant damage has already disrupted movement, often relying on community labor rather than structured and routine government intervention.

A community representative from Lindi Region observed:

“Maintenance happens only when the road is completely blocked.” — Community Representative, Lindi Region

Participants from Morogoro Region linked recurring deterioration to the absence of proper drainage systems:



“They fill potholes, but without drainage the road is destroyed again.” — FGD Participant, Morogoro Region

A transport authority official from Manyara Region acknowledged financial constraints affecting maintenance schedules:

“We prioritize based on budget, but not all roads can be maintained annually.” — Interview respondent, Manyara Region

The lack of preventive and routine maintenance accelerates infrastructure degradation and increases long-term rehabilitation costs. Dependence on emergency repairs weakens sustainability and contributes to cyclical road failure across rural areas.

6.1.1.13 General condition of roads used by transport service providers

This subsection presents transport service providers' views on the condition of roads they use most often. Their assessments reflect actual operating conditions, including travel time, vehicle wear, and service reliability.

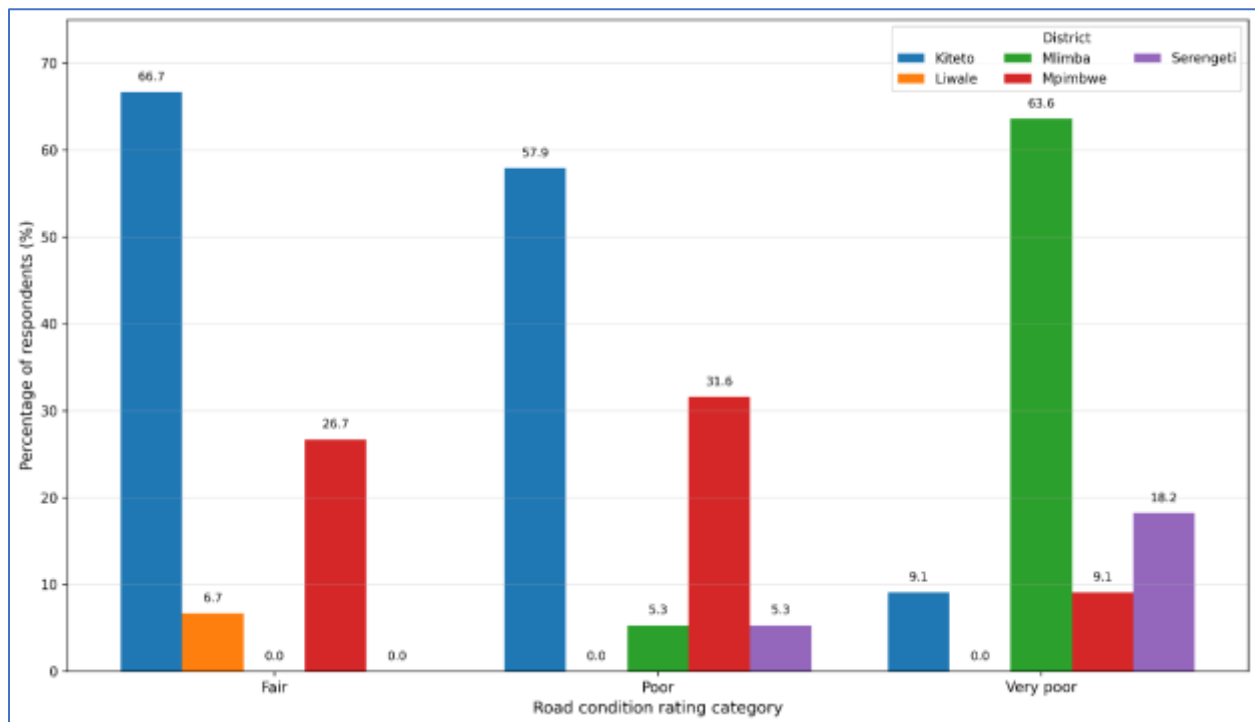


Figure 6: Transport Service Providers' Rating of General Road Condition

The results in figure 6 show that road conditions are generally perceived as poor to very poor by transport service providers. A large share of respondents in Mlimba (63.6%) rated roads as very poor, indicating serious infrastructure challenges. Ratings of poor conditions are also notable in Kiteto (57.9%) and Mpimbwe (31.6%), suggesting widespread road quality issues. Some providers rated roads as fair, particularly in Kiteto



(66.7%) and Mpimbwe (26.7%), indicating variation in road conditions across areas. Overall, the findings suggest that many roads used for transport services are in weak condition, which may increase operating costs, reduce service frequency, and affect reliability of transport in rural areas.

Roads Described as Hostile to Vehicles

Transport service providers consistently described rural roads as damaging, unsafe, and commercially risky. Potholes, mud, loose stones, and eroded sections were identified as routine hazards that increase operational strain.

A transport service provider from Katavi Region observed:

“None of the roads are friendly. Vehicles break down frequently.” — Interview respondent, Katavi Region

Drivers from Mara Region similarly emphasized the financial burden associated with poor road conditions:

“These roads destroy vehicles faster than you can recover costs.” — Interview respondent, Mara Region

Poor road conditions directly undermine the sustainability of transport services. Frequent vehicle damage raises operating costs, reduces route coverage, and discourages further investment. As a result, infrastructure deterioration contributes to limited-service availability and weakened transport reliability in rural areas.

6.1.1.14 Dominant Road surface type on routes used by transport service providers

This subsection examines the main road surface types used by transport service providers on their usual routes. Road surface type affects vehicle performance, travel time, maintenance costs, and service reliability.

Table 9: Dominant Road Surface Type on Usual Transport Routes

District	Graveled (%)	Dirt/Earth (%)	No defined road (%)	Total (%)
Kiteto	46.7	23.9	0	32.1
Liwale	0	2.2	0	1.3
Mlimba	13.3	54.4	0	37.2
Mpimbwe	30	6.5	100	18
Serengeti	10	13	0	11.5
Total	100	100	100	100



The results in table 9 show that transport service providers mainly operate on low-standard road surfaces, particularly dirt and gravel roads. Dirt/earth roads dominate in Mlimba (54.4%), indicating heavy reliance on unpaved and seasonal routes. Graveled roads are most common in Kiteto (46.7%) and Mpimbwe (30.0%), suggesting relatively better but still non-paved conditions. A unique case appears in Mpimbwe, where 100.0% reported routes with no defined road, indicating reliance on informal or off-road paths in some areas. Overall, the findings indicate that most transport services operate on unpaved surfaces, which can reduce efficiency, increase vehicle maintenance costs, and limit reliability, especially during adverse weather conditions.

Earth and Poor-Quality Gravel Surfaces

Routes used by transport providers were predominantly earth roads. In several cases, roads described locally as gravel were reported to lack proper compaction, drainage, and engineered standards.

A transport service provider from Katavi Region explained the distinction:

“They say it is gravel, but it is just stones on soil.” — Interview respondent, Katavi Region

A district-level technical official from Morogoro Region confirmed this observation:

“Most village roads are earth roads even if they appear gravel.” — Interview respondent, Morogoro Region

The misclassification of road surfaces can obscure the actual vulnerability of rural infrastructure. Earth-dominated routes lack structural resilience and climate resistance, which helps explain the frequent seasonal deterioration reported across study areas.

6.1.1.15 Seasonal changes in road condition on transport routes

This subsection examines whether road conditions change between rainy and dry seasons, based on responses from transport service providers. Seasonal variation affects road usability, travel time, and service continuity.

Table 10: Seasonal Changes in Road Condition (Rainy vs. Dry Season)

District	Much worse (%)	Slightly worse (%)	No major change (%)	Total (%)
Kiteto	31.4	33.3	50	32.1
Liwale	1.4	0	0	1.3
Mlimba	41.4	0	0	37.2
Mpimbwe	12.9	66.7	50	18
Serengeti	12.9	0	0	11.5



District	Much worse (%)	Slightly worse (%)	No major change (%)	Total (%)
Total	100	100	100	100

The results in table 10 show that road conditions generally worsen during the rainy season, though the degree varies by district. A higher share of providers in Mlimba (41.4%) and Kiteto (31.4%) reported that roads become much worse, indicating strong weather sensitivity. In Mpimbwe, most respondents (66.7%) reported roads become slightly worse, suggesting some seasonal impact but less severe compared to other areas. Some respondents, particularly in Kiteto (50.0%) and Mpimbwe (50.0%), reported no major change, indicating relatively stable conditions in certain routes. Overall, the findings indicate that many transport routes are affected by seasonal changes, with road conditions often deteriorating during the rainy season, which can reduce reliability and increase travel difficulties.

Sharp Deterioration During Rainy Season

Respondents across all regions described severe seasonal deterioration during the rainy season, when previously passable roads turn into mud, deep gullies, and flooded sections.

A participant from Mara Region explained the consequences for emergency mobility:

“During rains, even carrying a patient becomes impossible.” — FGD Participant, Mara Region

Seasonality emerged as a defining feature of rural transport unreliability. The absence of climate-resilient engineering, proper drainage, and durable surfacing contributes to predictable road failure during heavy rainfall, severely limiting access to essential services.

6.1.1.16 Route obstruction due to weather or road damage

This subsection assesses how often transport routes are obstructed due to weather conditions or road damage, based on responses from transport service providers. Such obstructions affect service continuity, travel time, and operating costs.

Table 11: Frequency of Route Obstruction Due to Weather or Road Damage

District	Very frequent (%)	Sometimes (%)	Rarely (%)	Never (%)	Total (%)
Kiteto	21.8	60	54.5	50	32.1
Liwale	1.8	0	0	0	1.3
Mlimba	47.3	20	9.1	0	37.2
Mpimbwe	20	0	27.3	0	18



District	Very frequent (%)	Sometimes (%)	Rarely (%)	Never (%)	Total (%)
Serengeti	9.1	20	9.1	50	11.5
Total	100	100	100	100	100

The findings table 11 show that route obstruction is a common challenge, though it varies across districts. Mlimba (47.3%) reports the highest share of very frequent obstruction, indicating regular disruptions to transport routes. In Kiteto, most respondents (60.0%) experience obstruction sometimes, suggesting periodic but consistent challenges. Some districts report lower or mixed levels of obstruction. For example, Mpimbwe (27.3%) shows a higher share of rare occurrences, while Serengeti (50.0%) reports a notable proportion where obstruction never occurs, indicating variation in road conditions and exposure to weather impacts. Overall, the results suggest that weather and road damage frequently disrupt transport routes in many areas, reducing reliability and creating operational difficulties for transport service providers.

Flooding and Wash-Aways as Primary Obstructions

Flooded bridges, collapsed culverts, and wash-aways were frequently cited as the main causes of complete route obstruction during the rainy season. Such events often result in total isolation of affected communities.

A participant from Lindi Region described the impact of flooding on mobility:

“Water covers the bridge, and nobody can cross.” — FGD Participant, Lindi Region

Weather-related obstructions effectively transform roads into barriers rather than connectors. These disruptions cut off communities from health facilities, markets, and schools, intensifying the vulnerability of rural populations during periods of heavy rainfall.

6.1.1.17 Safety and usability of bridges and culverts on transport routes

This subsection examines how often bridges and culverts become unsafe or unusable, based on responses from transport service providers. Their condition is critical for safe and continuous movement, especially during heavy rains.

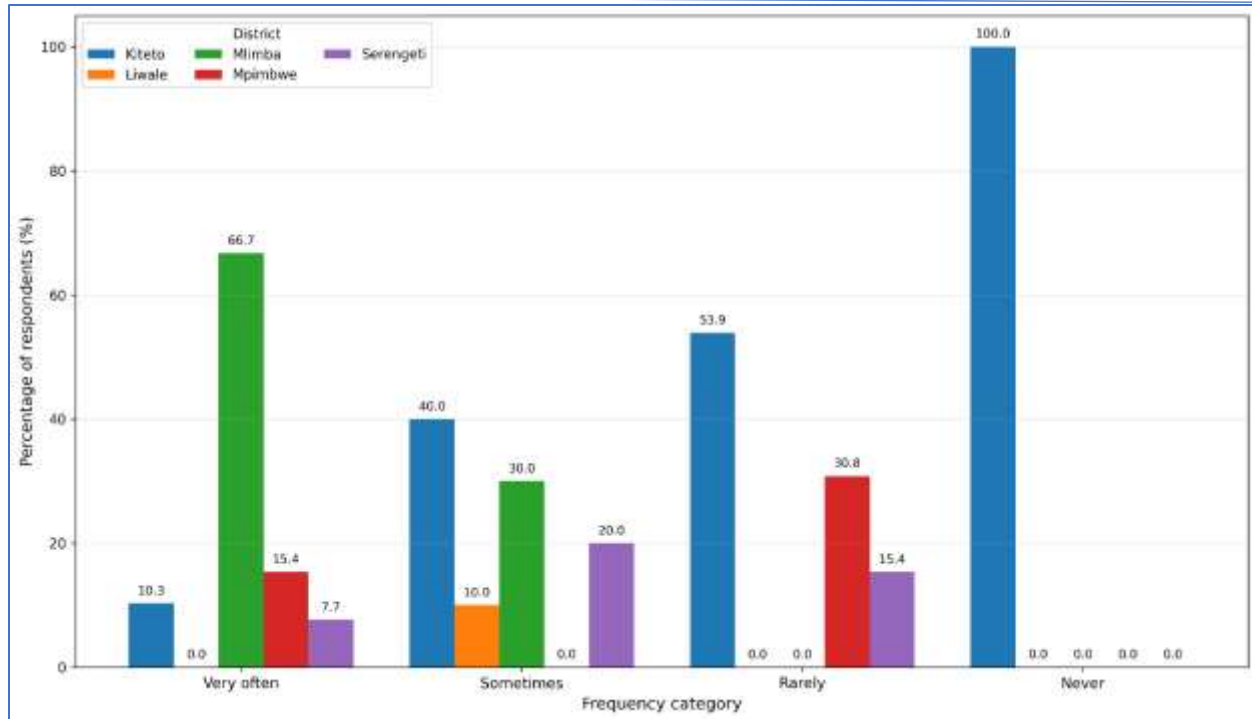


Figure 7: Frequency of Bridges or Culverts Becoming Unsafe or Unusable

The findings figure 7 show that problems with bridges and culverts are common in several districts, though the frequency varies. Mlimba (66.7%) reports the highest share of cases where structures become unsafe very often, indicating serious infrastructure weaknesses. In Kiteto, most responses fall under sometimes (40.0%) and rarely (53.9%), suggesting intermittent but recurring issues. Mpimbwe (30.8%) also reports a notable share of cases occurring rarely, while Serengeti shows mixed responses, with issues reported both sometimes and rarely. Overall, the results suggest that bridges and culverts frequently become unsafe in some areas, especially in Mlimba, which can disrupt transport routes, increase safety risks, and reduce the reliability of services during certain periods.

6.1.1.17 Safety and usability of bridges and culverts on transport routes

Undersized and Unsafe Structures

Bridges and culverts were widely described as narrow, low, and structurally unsafe. Respondents noted that many crossings were not designed to accommodate current traffic volumes or seasonal water flow.

A community representative from Katavi Region explained:

“The bridge is so narrow that cars and motorcycles cannot pass together.” — Community Representative, Katavi Region



Inadequate bridge and culvert design compromises both safety and continuity of transport, particularly during the rainy season. Limited width, low elevation, and weak structural reinforcement increase the risk of accidents and temporary closures, further undermining rural mobility.

6.1.1.18 Vehicle damage caused by poor road conditions

This subsection examines whether poor road conditions have caused damage to vehicles used by transport service providers. Vehicle damage reflects the direct impact of road quality on operating costs and service reliability.

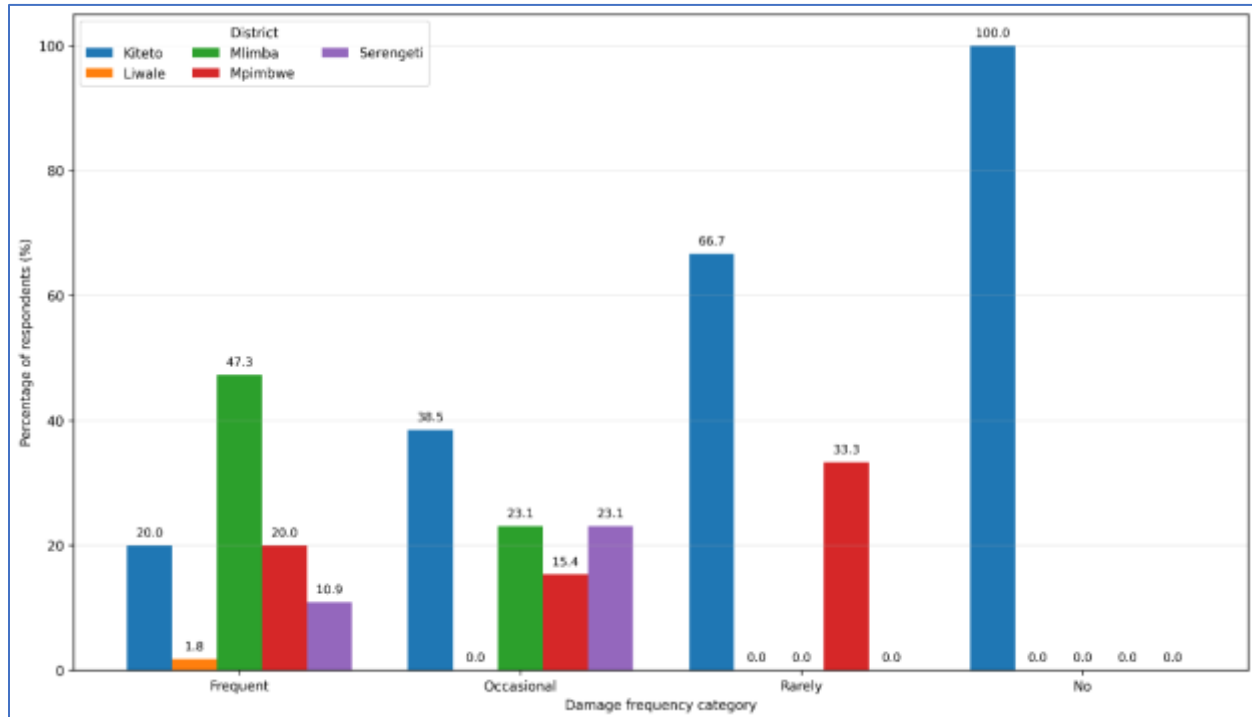


Figure 8: Incidence of Vehicle Damage Due to Poor Road Conditions

The findings in figure 8 show that vehicle damage due to poor road conditions is common across several districts. Mlimba (47.3%) reports the highest share of frequent damage, indicating serious road quality issues affecting transport operations. In Kiteto, many providers report occasional damage (38.5%) and rare cases (66.7%), suggesting mixed experiences depending on route conditions. Mpimbwe (33.3%) shows a notable share of rare damage, while Serengeti (23.1%) reports a moderate level of occasional damage. Overall, the results indicate that poor road conditions often lead to vehicle damage, especially in districts like Mlimba. This increases maintenance costs, affects service reliability, and can contribute to higher transport costs for users.

Frequent Breakdowns and High Maintenance Costs



Transport operators and traders consistently reported frequent vehicle breakdowns linked to poor road conditions. Mechanical damage, tire punctures, and suspension failure were described as routine occurrences.

A participant from Katavi Region explained the economic consequences:

“My vehicle broke down for two days and all goods spoiled.” — FGD Participant, Katavi Region

Vehicle damage has direct economic implications. Breakdowns result in income loss, spoilage of perishable goods, higher repair costs, and reduced service availability. Over time, this discourages transport investment and further limits mobility options in rural areas.

6.1.1.19 Use of detours or alternative informal routes

This subsection examines how frequently transport service providers use detours or informal routes due to poor road conditions. Frequent detours indicate road network disruption and limited route reliability.

Table 12: Frequency of Using Detours or Alternative Informal Routes

District	Daily (%)	Weekly (%)	Monthly (%)	Rarely (%)	Never (%)	Total (%)
Kiteto	8.6	66.7	0	60	40	32.1
Liwale	0	0	0	3.3	0	1.3
Mlimba	74.3	0	40	3.3	0	37.2
Mpimbwe	8.6	33.3	60	20	20	18
Serengeti	8.6	0	0	13.3	40	11.5
Total	100	100	100	100	100	100

The results in table 12 show that detours are widely used, though the frequency varies across districts. Mlimba (74.3%) has the highest share of daily detour use, indicating frequent road disruptions and limited route reliability. In Kiteto, most providers report using detours weekly (66.7%), along with notable shares reporting rare and occasional use, suggesting recurring but less severe disruptions. Mpimbwe shows a mixed pattern, with higher shares of monthly (60.0%) and weekly (33.3%) use, indicating periodic reliance on alternative routes. In contrast, Serengeti shows a relatively higher share reporting never (40.0%) or rarely (13.3%), suggesting fewer detour needs in some routes. Overall, the findings indicate that many transport providers rely on detours, especially in areas with poor or damaged roads. This can increase travel time, fuel costs, and vehicle wear, and may reduce the frequency and reliability of transport services reaching rural communities.



Widespread Use of Informal Paths

Residents frequently reported using farms, private land, and riverbeds as alternative routes when formal roads become impassable. These detours are often improvised and lack any formal protection or maintenance.

A participant from Morogoro Region explained:

“We pass through farms when roads are blocked.” — FGD Participant, Morogoro Region

The reliance on informal paths reflects community-level adaptation to infrastructure failure. However, such routes can create land-use conflicts, expose users to safety hazards, and further degrade surrounding environments. While they demonstrate resilience, they also highlight the inadequacy of formal transport infrastructure.

6.1.1.20 Visibility of road maintenance activities on transport routes

This subsection assesses whether transport service providers observe road maintenance activities on the routes they use, based on survey responses. Visibility of maintenance reflects the level of road management and ongoing upkeep.

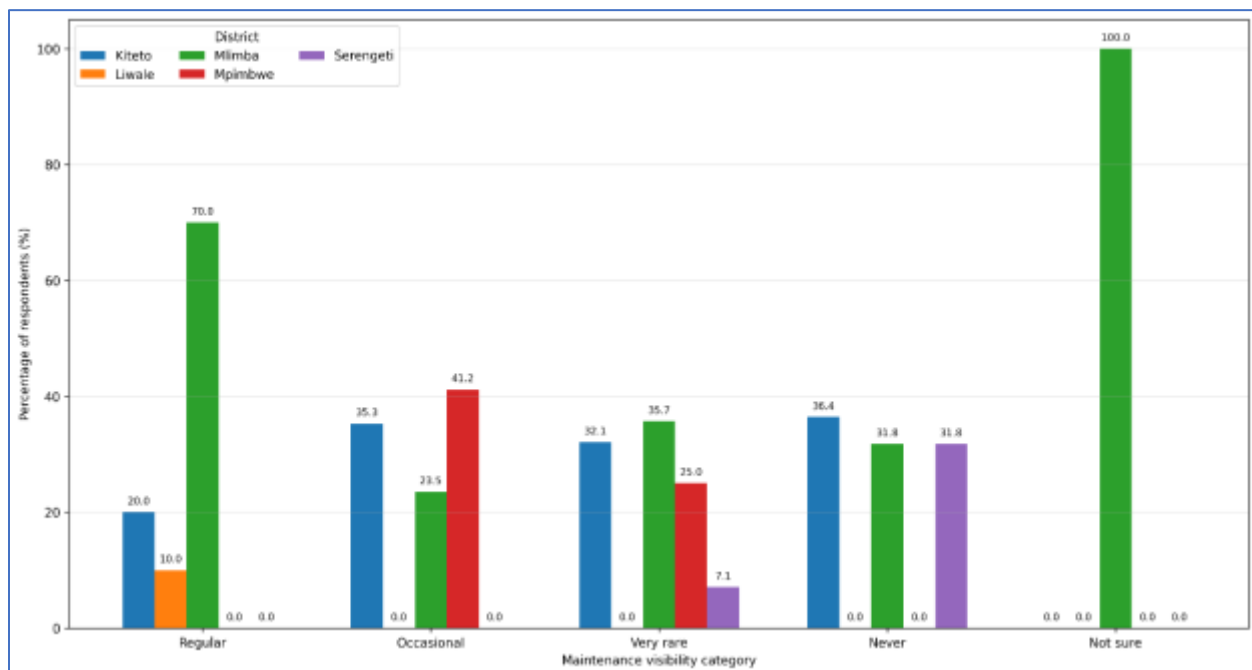


Figure 9: Visibility of Road Maintenance Activities on Transport Routes

The findings in figure 9 show mixed visibility of road maintenance across districts. Mlimba (70.0%) reports the highest share of regular maintenance, suggesting relatively more visible activity in some routes. In Kiteto, maintenance is more often reported as occasional (35.3%), with notable shares also indicating it is very rare or never observed, pointing to inconsistent upkeep. Mpimbwe (41.2%) also reports a higher share of



occasional maintenance, while Serengeti shows limited visibility, with some respondents indicating maintenance is rarely or never seen. Overall, the results suggest that road maintenance activities are uneven and often infrequent across districts, which may contribute to continued road deterioration and reduced reliability of transport services.

Maintenance Rarely Visible

Most participants reported that visible road maintenance activities are infrequent. Routine grading, drainage clearing, and structural repairs were described as rare or short-lived.

A community representative from Mara Region observed:

“We only see maintenance when leaders visit.” — Community Representative, Mara Region

The limited visibility of maintenance efforts contributes to perceptions of neglect and weak accountability. In practical terms, inadequate routine maintenance accelerates road deterioration, reduces durability, and undermines long-term infrastructure performance.

6.1.1.21 Observed predominant road surface type in the area

This subsection presents findings from direct field observations on the dominant road surface type in the study areas. These observations provide an objective check on survey responses and reflect actual road conditions.

Table 13: Predominant Road Surface Type Observed in the Area

District	Paved (%)	Graveled (%)	Dirt/Earth (%)	Total (%)
Kiteto	0	0	10.5	8.7
Liwale	100	66.7	15.8	26.1
Mlimba	0	0	31.6	26.1
Mpimbwe	0	33.3	21.1	21.7
Serengeti	0	0	21.1	17.4
Total	100	100	100	100

The findings in table 13 show that dirt/earth roads dominate across most districts, particularly in Mlimba (31.6%), Mpimbwe (21.1%), and Serengeti (21.1%), confirming the widespread presence of low-standard road surfaces. Graveled roads are observed mainly in Liwale (66.7%) and Mpimbwe (33.3%), indicating some level of intermediate road improvement in these areas. Paved roads are very limited, with observations mainly concentrated in Liwale (100.0%), while other districts reported no paved surfaces. Overall, the observations



confirm that rural road infrastructure is largely unpaved, supporting earlier findings of poor road conditions and high vulnerability to weather-related disruptions.



Figure 10: Observed Predominant Road Surface Types in the Study Area

Figure 10 visually illustrates these findings, showing that dirt or earth roads dominate the road network and are highly susceptible to weather impacts. Graveled roads are limited and offer only modest improvements in accessibility, while paved roads are scarcely present. Overall, the image confirms the widespread lack of durable road infrastructure, contributing to poor connectivity and frequent weather-related access constraints.

6.1.1.22 Observed physical condition of roads

This subsection presents findings from direct field observations on the visible condition of roads in the study areas. These observations provide an objective assessment of road usability and help validate survey results.

Table 14: Observed Visible Condition of Roads

District	Good (%)	Moderate (%)	Poor (%)	Impassable (%)	Total (%)
Kiteto	0	11.1	10	0	8.7
Liwale	100	22.2	10	0	26.1



District	Good (%)	Moderate (%)	Poor (%)	Impassable (%)	Total (%)
Mlimba	0	22.2	40	0	26.1
Mpimbwe	0	44.4	0	100	21.7
Serengeti	0	0	40	0	17.4
Total	100	100	100	100	100

The observations in table 14 show that road conditions are generally weak and uneven across districts. A high share of roads is rated as poor, particularly in Mlimba (40.0%) and Serengeti (40.0%), indicating widespread deterioration. Some roads are in moderate condition, especially in Mpimbwe (44.4%) and Liwale (22.2%), suggesting partial usability but still below good standards. Cases of impassable roads are observed in Mpimbwe (100.0%), highlighting serious access challenges in certain locations. Only a small share of roads is rated as good, mainly observed in Liwale (100.0%), while other districts reported none. Overall, the findings confirm that a large proportion of roads are in poor or unusable condition, supporting earlier evidence of limited road quality and vulnerability to disruption in rural areas.



Figure 11: Observed Road Conditions

Figure 11 presents field photographs showing the physical condition of roads in the study areas. Several images illustrate poor and impassable road sections, marked by severe erosion, washed-out surfaces, and deep gullies that limit or prevent vehicle movement. Other images show road sections under repair, with exposed culverts and temporary safety measures, indicating ongoing but incomplete interventions. Some photographs depict moderate road conditions, where unpaved roads remain passable but show surface wear and edge degradation. A few images represent good road conditions, characterized by relatively smooth surfaces and uninterrupted traffic flow. Overall, the images confirm that a large proportion of rural roads are in poor or impassable condition, supporting survey findings of limited usability and high vulnerability to disruption.



6.1.1.23 Observed presence and functionality of drainage systems

This subsection presents findings from direct field observations on the presence and functionality of drainage systems, including ditches and culverts. Proper drainage is essential for protecting roads from water damage and maintaining usability, especially during rainy seasons.

Table 15: Presence and Functionality of Drainage Systems

District	Well-maintained (%)	Partially blocked (%)	Not functional (%)	Not present (%)	Total (%)
Kiteto	0	50	0	0	8.7
Liwale	100	25	0	15.4	26.1
Mlimba	0	0	33.3	38.5	26.1
Mpimbwe	0	0	0	38.5	21.7
Serengeti	0	25	66.7	7.7	17.4
Total	100	100	100	100	100

The observations in table 15 show significant gaps in drainage infrastructure across districts. Only a limited share of roads has well-maintained drainage, mainly observed in Liwale (100.0%), while other districts reported none. In Kiteto (50.0%) and Serengeti (25.0%), drainage systems are often partially blocked, indicating reduced effectiveness. A notable proportion of drainage systems are not functional, particularly in Serengeti (66.7%) and Mlimba (33.3%), suggesting poor maintenance and frequent failure. Additionally, many roads lack drainage entirely, especially in Mlimba (38.5%) and Mpimbwe (38.5%), which increases vulnerability to flooding and erosion. Overall, the findings indicate weak and inconsistent drainage provision, which contributes to road deterioration and reduces usability, particularly during rainy periods.



Figure 12: Presence and Functionality of Drainage Systems

Figure 12 presents field photographs showing the condition of drainage systems along selected road sections. The images illustrate limited drainage provision, including absent, poorly maintained, and partially functional culverts and drainage channels. In several locations, exposed or blocked drainage structures indicate reduced effectiveness in controlling runoff. Overall, the visual evidence confirms weak drainage infrastructure, contributing to road surface deterioration and reduced usability during rainy periods.

6.1.1.24 Observed condition of bridges and culverts

This subsection presents findings from direct field observations on the presence and condition of bridges and culverts in the study areas. These structures are important for ensuring safe crossing and maintaining route continuity.

Table 16: Observed Presence and Condition of Bridges and Culverts

District	Good condition (%)	Poor condition (%)	Damaged (%)	None observed (%)	Total (%)
Kiteto	0	20	50	0	8.7
Liwale	50	40	0	10	26.1
Mlimba	16.7	20	50	30	26.1
Mpimbwe	33.3	0	0	30	21.7
Serengeti	0	20	0	30	17.4
Total	100	100	100	100	100

The observations in table 16 show that bridge and culvert infrastructure is limited and uneven across districts. Some areas, such as Liwale (50.0%) and Mpimbwe (33.3%), have structures in good condition, indicating



relatively better infrastructure in specific locations. However, a considerable number of structures are in poor condition, particularly in Liwale (40.0%) and Mlimba (20.0%), suggesting maintenance challenges. Cases of damaged or broken structures are high in Kiteto (50.0%) and Mlimba (50.0%), indicating serious risks to safe passage and continuity of routes. In addition, several locations reported no bridges or culverts at all, especially in Mlimba, Mpimbwe, and Serengeti (30.0% each), highlighting gaps in infrastructure. Overall, the findings indicate that bridges and culverts are either lacking or in poor condition in many areas, which increases the risk of access disruption and road damage, particularly during rainy seasons.



Figure 13: Observed Bridges and Culverts

Figure 13 presents field photographs showing the presence and condition of bridges and culverts in the study areas. The images illustrate both functional crossing structures, including concrete bridges and culverts that maintain road continuity, and structures in poor condition, where visible wear, sediment accumulation, and waste blockage restrict water flow. Some culverts appear partially blocked, reducing their effectiveness in conveying runoff, while certain bridge elements show signs of deterioration along embankments and edges. The images also reflect the uneven distribution of crossing infrastructure, with some road sections adequately served by bridges or culverts and others lacking such structures altogether. Overall, the visual evidence supports the observation that bridge and culvert infrastructure is limited and inconsistently maintained, increasing the risk of erosion, flooding, and access disruption during rainy periods.

6.1.1.25 Observed presence of warning signs and safety indicators

This subsection presents findings from direct field observations on the availability of warning signs and safety indicators along rural roads. These features are important for guiding road users and improving safety.

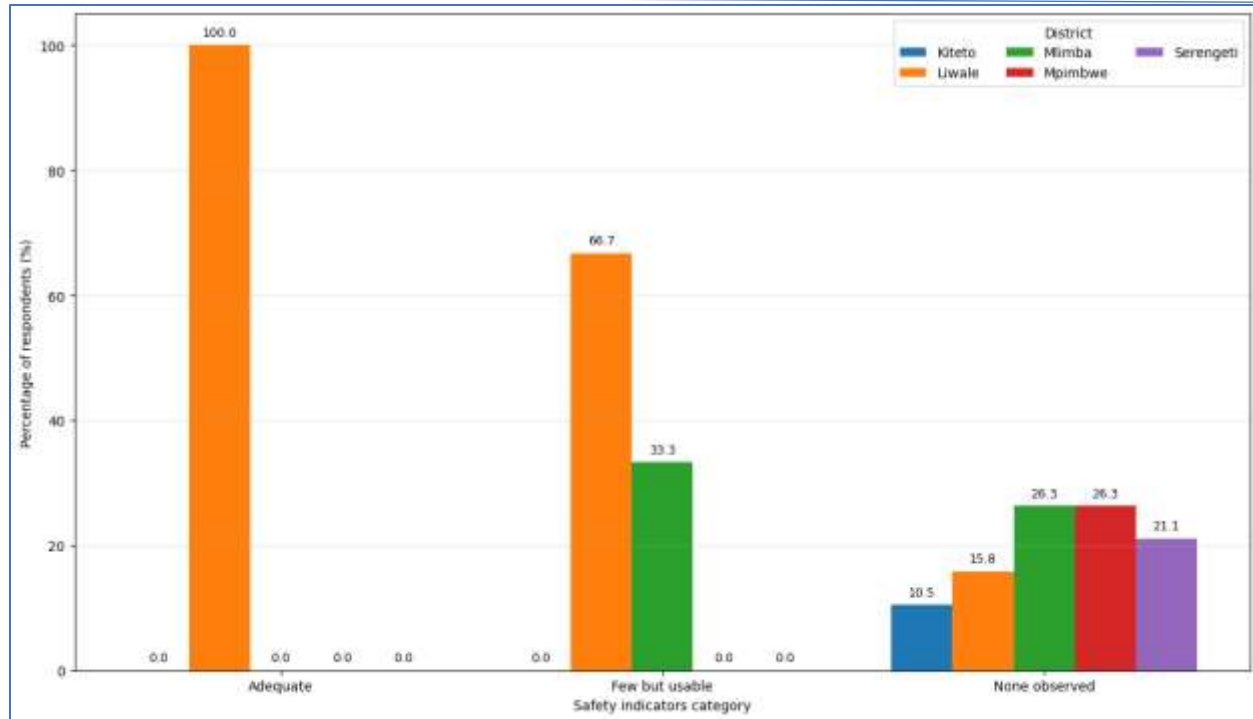


Figure 14: Observed Warning Signs and Safety Indicators

The observations in figure 14 show that warning signs and safety indicators are limited in most areas. A relatively higher presence of adequate signs is observed in Liwale (100.0%), while other districts reported none. Some locations, particularly in Liwale (66.7%) and Mlimba (33.3%), have few but usable signs, indicating partial availability. However, many areas report no safety indicators at all, especially in Mpimbwe (26.3%), Mlimba (26.3%), and Serengeti (21.1%), showing gaps in road safety infrastructure. Overall, the findings suggest that road safety features are often absent or insufficient, which may increase risks for road users and reduce overall road safety in rural areas.

6.1.1.26 Observed availability of pedestrian walkways and footpaths

This subsection presents findings from direct field observations on the presence of pedestrian walkways or footpaths along rural roads. Such infrastructure supports safe movement, especially where walking is common.

Table 17: Observed Availability of Pedestrian Walkways or Footpaths

District	Continuous (%)	Informal paths (%)	None observed (%)	Total (%)
Kiteto	0	25	5.6	8.7
Liwale	100	0	27.8	26.1



District	Continuous (%)	Informal paths (%)	None observed (%)	Total (%)
Mlimba	0	25	27.8	26.1
Mpimbwe	0	0	27.8	21.7
Serengeti	0	50	11.1	17.4
Total	100	100	100	100

The observations in table 17 show that pedestrian infrastructure is limited across most districts. Only a few areas, mainly Liwale (100.0%), have continuous and maintained walkways, while other districts reported none. In several locations, movement depends on informal paths, especially in Serengeti (50.0%) and Kiteto and Mlimba (25.0% each), indicating partial but unstructured access. At the same time, many areas report no pedestrian walkways at all, particularly in Mlimba, Mpimbwe, and Liwale (27.8% each), showing clear gaps in infrastructure. Overall, the findings suggest that most pedestrians rely on informal paths or share road space with vehicles, which may increase safety risks and limit ease of movement.

6.1.1.27 Observed availability of transport facilities (bus stops or waiting sheds)

This subsection presents findings from direct field observations on the presence of basic transport facilities such as bus stops or waiting sheds. These facilities support organized and safe passenger movement and reflect the level of transport service development.

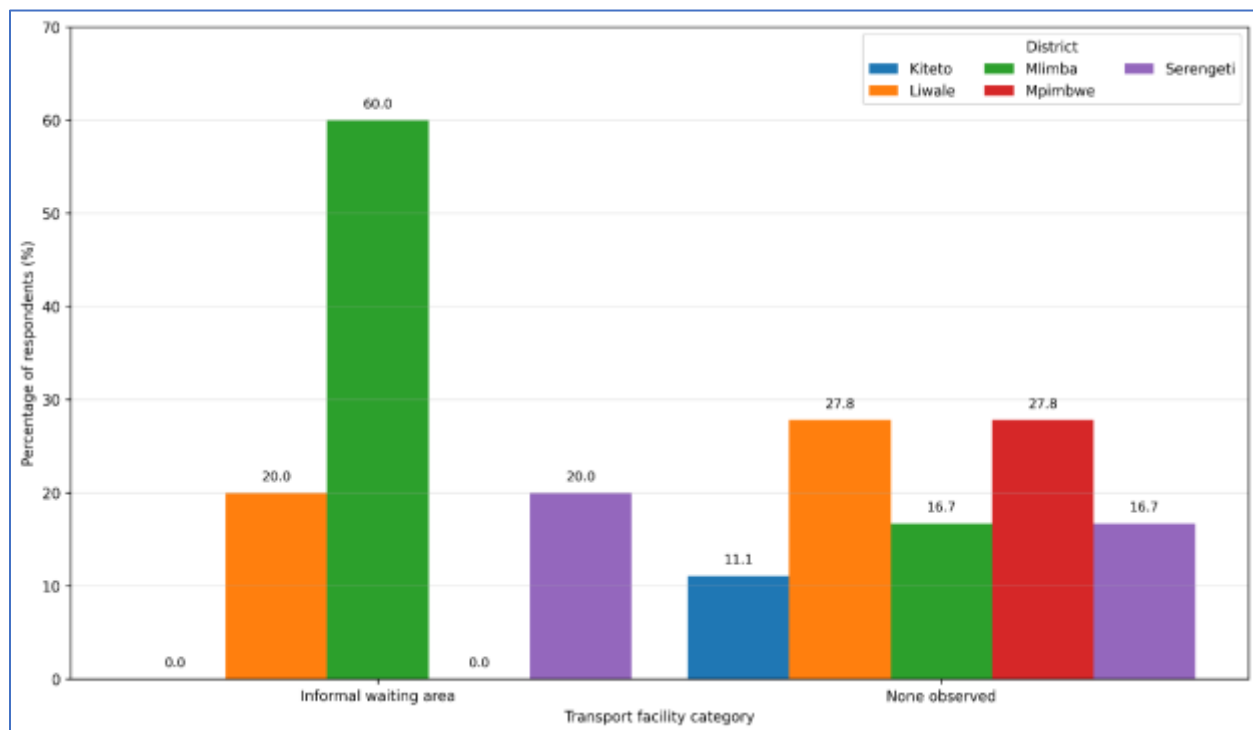




Figure 15: Observed Availability of Transport Facilities

The observations in figure 15 show that formal transport facilities are limited across most districts. A relatively higher presence of informal waiting areas is observed in Mlimba (60.0%), followed by Liwale and Serengeti (20.0% each), indicating some level of basic infrastructure. However, several areas report no transport facilities at all, particularly in Liwale and Mpimbwe (27.8% each), as well as Kiteto (11.1%), highlighting gaps in service support infrastructure. Overall, the findings suggest that many rural areas lack formal bus stops or waiting sheds, and where facilities exist, they are mostly informal. This may reduce comfort and safety for passengers and limit the effectiveness of transport services.

6.1.1.28 Observed vehicle accessibility of roads at the time of visit

This subsection presents findings from direct field observations on whether roads were accessible to vehicles at the time of the site visit. These observations provide real-time evidence of road usability and complement survey responses.

Table 18: Observed Vehicle Accessibility of Roads

District	Fully accessible (%)	Partially obstructed (%)	Inaccessible (%)	Total (%)
Kiteto	0	11.1	25	8.7
Liwale	50	11.1	0	26.1
Mlimba	30	11.1	50	26.1
Mpimbwe	20	22.2	25	21.7
Serengeti	0	44.4	0	17.4
Total	100	100	100	100

The observations in table 18 show that vehicle accessibility varies across districts and is often constrained. Fully accessible roads are most observed in Liwale (50.0%) and Mlimba (30.0%), indicating relatively better conditions in some locations. However, a notable share of roads is partially obstructed, especially in Serengeti (44.4%) and Mpimbwe (22.2%), suggesting reduced usability. Cases of inaccessible roads are high in Mlimba (50.0%), as well as in Kiteto and Mpimbwe (25.0% each), highlighting serious access challenges in certain areas. Overall, the findings indicate that many roads are either partially obstructed or inaccessible, confirming limited usability and supporting earlier evidence of frequent access disruptions in rural areas.

6.1.1.29 Observed use of routes by public or private transport vehicles



This subsection presents findings from direct field observations on whether public or private transport vehicles were using the observed routes. Actual vehicle movement provides practical evidence of road usability and transport activity.

Table 19: Observed Use of Routes by Transport Vehicles

District	Frequently (%)	Occasionally (%)	Rarely (%)	None observed (%)	Total (%)
Kiteto	0	0	16.7	14.3	8.7
Liwale	50	50	0	14.3	26.1
Mlimba	25	50	50	0	26.1
Mpimbwe	25	0	16.7	28.6	21.7
Serengeti	0	0	16.7	42.9	17.4
Total	100	100	100	100	100

The observations in table 19 show mixed levels of transport activity across districts. Frequent vehicle use is most evident in Liwale (50.0%) and partly in Mlimba and Mpimbwe (25.0% each), indicating active use of some routes. Occasional use is also notable in Liwale and Mlimba (50.0% each), suggesting moderate but not consistent transport presence. At the same time, several routes are rarely used, particularly in Mlimba (50.0%), Kiteto (16.7%), and Serengeti (16.7%), reflecting limited movement. A significant share of routes has no vehicles observed, especially in Serengeti (42.9%) and Mpimbwe (28.6%), indicating very low transport activity in some areas. Overall, the findings suggest that while some routes are actively used, many rural roads experience limited or no vehicle movement, highlighting constraints related to road condition, accessibility, and availability of transport services.

6.1.1.30 Observed evidence of recent road improvements

This subsection presents findings from direct field observations on whether there is visible evidence of recent road improvements. Such evidence reflects recent maintenance or investment and helps assess current road condition and usability.

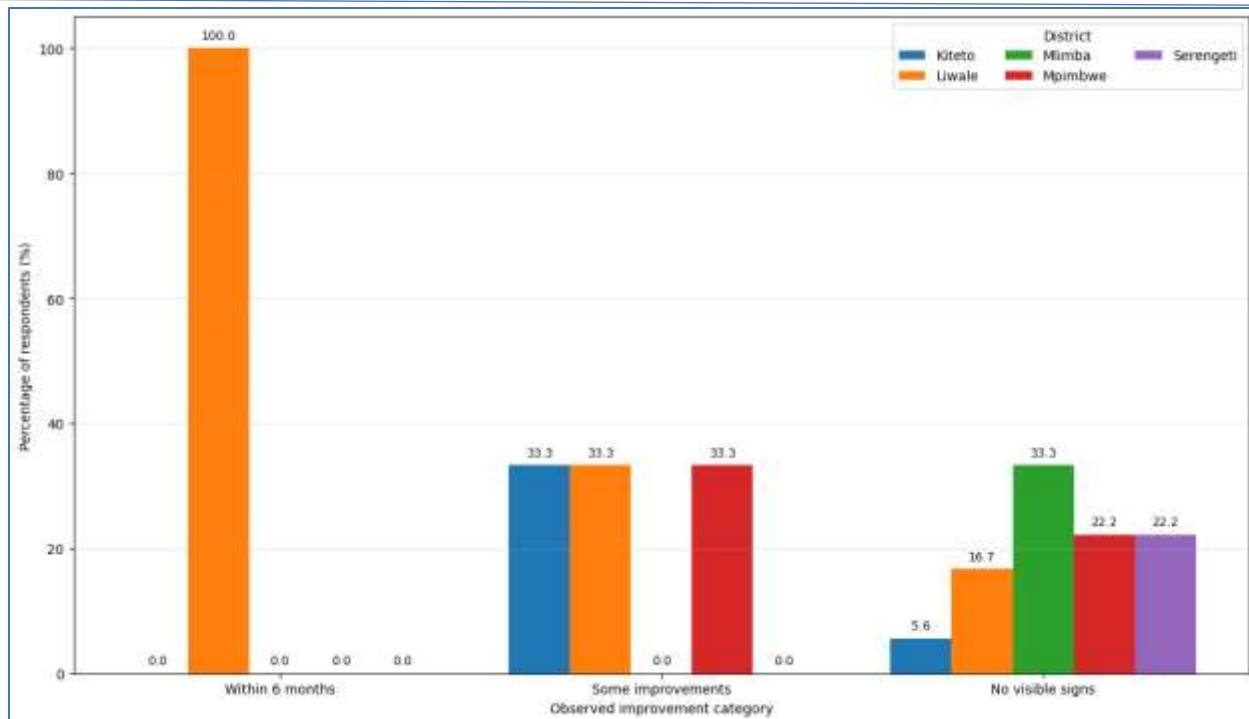


Figure 16: Observed Evidence of Recent Road Improvements

The observations in figure 16 show that recent road improvements are uneven and limited across districts. Evidence of recent improvements within the last six months is mainly observed in Liwale (100.0%), while other districts reported none. Some areas, such as Kiteto and Mpimbwe (33.3% each), show improvements over a longer period, indicating partial maintenance efforts. However, many locations report no visible signs of recent improvement, especially in Mlimba (33.3%), Mpimbwe (22.2%), and Serengeti (22.2%), pointing to limited recent activity. Overall, the findings suggest that recent road improvement efforts are not widespread, and many roads show little evidence of maintenance, which may contribute to continued poor conditions and limited usability.

6.1.1.31 Road type connecting villages to the nearest town by age group

This subsection examines the main types of roads connecting villages to the nearest town across districts, based on the Household Survey. The distribution of road types provides insight into variations in transport infrastructure quality and accessibility between areas.

Table 20: Main Type of Road Connecting the Village to the Nearest Town

District	Paved (tarmac) (%)	Graveled (%)	Dirt/earth road (%)	No road access (footpath only) (%)	Total (%)
Kiteto	0	46	12.5	0	16.6
Liwale	16.7	10.8	14.2	0	13.7



District	Paved (tarmac) (%)	Graveled (%)	Dirt/earth road (%)	No road access (footpath only) (%)	Total (%)
Mlimba	0	5.4	35.6	100	31.1
Mpimbwe	66.7	21.6	6.9	0	10.1
Serengeti	16.7	16.2	30.9	0	28.5
Total	100	100	100	100	100

Table 20 show clear differences in road types across districts. Dirt or earth roads are the most dominant overall, accounting for the largest share (35.6%), followed by gravel roads, while paved roads remain limited. In Mlimba, dirt roads are most prevalent (35.6%), and it is the only district reporting no road access (footpath only), indicating severe accessibility constraints. In Kiteto, gravel roads dominate (46.0%), suggesting moderate infrastructure development but continued reliance on unpaved roads, with no access to paved roads. In contrast, Mpimbwe has the highest proportion of paved roads (66.7%), indicating relatively better infrastructure and connectivity. Liwale and Serengeti show mixed road conditions, with some access to paved roads (16.7%) but continued reliance on dirt and gravel roads. In Serengeti, dirt roads remain significant (30.9%), highlighting persistent dependence on low-quality road surfaces. Overall, the findings indicate that most rural areas remain dependent on unpaved road networks, which are vulnerable to seasonal deterioration and can limit transport reliability and access to essential services.

6.1.1.32 General condition of roads used, by type of transport service

This subsection examines how the general condition of roads varies across districts, based on responses from Transport Service Providers. Understanding road condition ratings helps explain how infrastructure quality affects transport operations and service reliability.

Table 21: Rating of General Road Condition

District	Fair (%)	Poor (%)	Very poor (%)	Total (%)
Kiteto	66.7	57.9	9.1	32.1
Liwale	6.7	0	0	1.3
Mlimba	0	5.3	63.6	37.2
Mpimbwe	26.7	31.6	9.1	18
Serengeti	0	5.3	18.2	11.5
Total	100	100	100	100



Table 21 show clear variation in perceived road conditions across districts. Overall, a large share of responses falls under poor and very poor categories, indicating widespread challenges in road quality. In Mlimba, the majority of responses rate roads as very poor (63.6%), highlighting severe infrastructure conditions that likely constrain transport operations and accessibility. In Kiteto, most respondents rate roads as fair (66.7%), although a substantial share also report poor conditions (57.9%), suggesting mixed road quality within the district. In Mpimbwe, road conditions are more balanced, with a relatively higher share rating roads as fair (26.7%) and poor (31.6%), indicating moderate infrastructure conditions compared to other districts. In Serengeti, responses are concentrated in the very poor category (18.2%), with limited reporting of fair conditions, suggesting continued challenges in road quality. In contrast, Liwale shows very limited reporting across all categories, reflecting a smaller sample size but suggesting fewer reported issues in road condition among respondents. Overall, the findings indicate that road conditions remain a major constraint across districts, with particularly severe challenges in areas such as Mlimba and Serengeti. Poor road quality affects transport reliability, increases operating costs, and limits the ability of transport providers to serve certain areas effectively.

6.2 Identify Transport Gaps & Challenges

6.2.1 Identify missing transport services and difficulties people face.

This subsection examines gaps in transport services and the practical difficulties people face in accessing mobility, using evidence from the Household Survey, Transport Service Providers, and field observations. The focus is on identifying situations where transport services are unavailable, unreliable, or disrupted due to poor road conditions. Many households experience periods when transport services are not accessible, particularly during rainy seasons or when roads deteriorate. Limited availability of regular public transport, reliance on informal modes, frequent route disruptions, and poor road conditions combine to restrict movement. Overall, the data show that transport gaps are widespread, with poor road infrastructure directly limiting access to transport, increasing travel time and costs, and reducing reliability for both users and service providers.

6.2.1.1 Inability to access transport due to poor road conditions

This subsection examines whether households have experienced situations where they could not access transport services due to poor road conditions, based on survey responses. This indicator reflects direct transport barriers faced by communities.

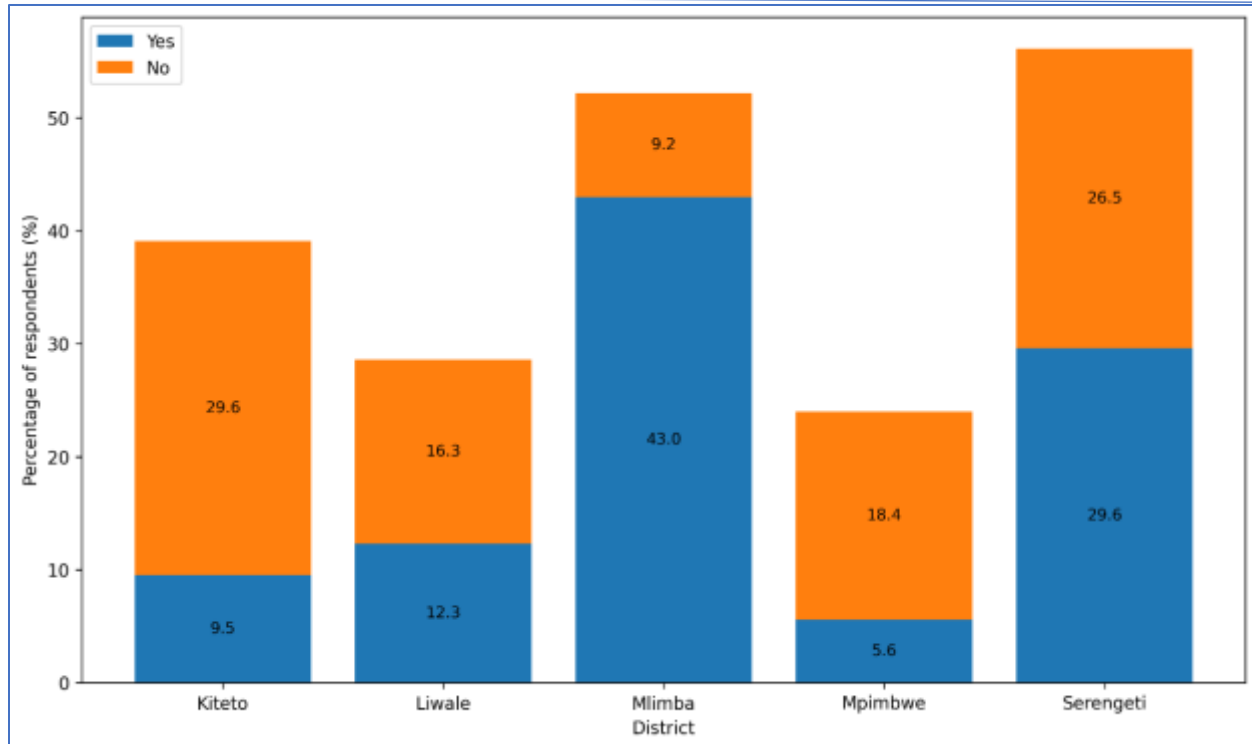


Figure 17: Inability to Access Transport Due to Poor Road Condition

The findings in figure 17 show that poor road conditions significantly affect access to transport in several districts. Mlimba (43.0%) has the highest share of households reporting inability to access transport, indicating serious constraints linked to road conditions. Serengeti (29.6%) also shows a high proportion of affected households, suggesting frequent transport access challenges. In comparison, Liwale (12.3%), Kiteto (9.5%), and Mpimbwe (5.6%) report lower levels, although some households in these areas still face difficulties. Overall, the results indicate that poor road conditions continue to limit transport access for many households, particularly in Mlimba and Serengeti, affecting movement to markets, health services, and other essential destinations.

Roads as the Primary Barrier to Mobility

Across all study regions, respondents emphasized that transport services may exist in principle but become functionally inaccessible due to poor road conditions. During the rainy season, muddy, flooded, or eroded roads often prevent vehicles from operating, leaving communities effectively isolated.

A participant from Morogoro Region explained:

“Transport is there, but when roads are bad, no driver agrees to come.” — FGD Participant, Morogoro Region

Similarly, participants from Lindi Region described how drivers avoid certain routes:



“Drivers refuse to enter the village because their vehicles get damaged.” — FGD Participant, Lindi Region

These accounts suggest that limited mobility is driven not only by the number of vehicles available but by infrastructure conditions that make service provision risky or commercially unviable. In this context, poor road quality transforms nominally available transport into an inaccessible resource.

6.2.1.2 Biggest transport-related challenge in the community

This subsection identifies the main transport challenges faced by households, based on survey responses. These challenges reflect key barriers affecting mobility and access to services.

Table 22: Biggest Transport-Related Challenge Reported by Households

District	Lack of roads (%)	Poor roads (%)	High cost (%)	No vehicles (%)	Safety (%)	Other (%)	Total (%)
Kiteto	23.9	10.1	43.5	11.1	0	16.7	16.6
Liwale	12.7	10.1	8.7	61.1	0	0	13.7
Mlimba	21.1	44.3	4.4	0	0	0	31.1
Mpimbwe	11.3	4.4	26.1	11.1	100	66.7	10.1
Serengeti	31	31	17.4	16.7	0	16.7	28.5
Total	100	100	100	100	100	100	100

The findings in table 22 show that transport challenges vary across districts, but road-related issues remain prominent. Poor road conditions are the main challenge in Mlimba (44.3%) and are also significant in Serengeti (31.0%), indicating widespread infrastructure problems. Lack of roads is also notable, particularly in Serengeti (31.0%) and Kiteto (23.9%), further highlighting gaps in road connectivity. In contrast, lack of vehicles is the biggest challenge in Liwale (61.1%), suggesting service availability issues rather than infrastructure alone. High transport costs are most reported in Kiteto (43.5%) and Mpimbwe (26.1%), indicating affordability concerns in these areas. Other challenges, including safety concerns and miscellaneous issues, appear less common overall, though Mpimbwe shows a high share in these categories, likely reflecting localized concerns. Overall, the results indicate that while challenges differ by location, poor road conditions and lack of infrastructure remain the dominant barriers, alongside cost and availability issues in some districts.

Poor Roads Identified as the Core Constraint



When asked to identify the single most significant transport challenge, respondents overwhelmingly pointed to poor road infrastructure rather than vehicle shortages or regulatory issues.

A community representative from Manyara Region expressed this clearly:

“Without roads, nothing else works.” — Community Representative, Manyara Region

Youth participants from Katavi Region conveyed a similar perspective:

“Transport problems start with the road, not the motorcycle.” — Youth Participant, Katavi Region

Road quality consistently emerged as the foundational determinant of transport performance. It shapes affordability, safety, service availability, and reliability, reinforcing infrastructure condition as the central constraint within rural transport systems.

6.2.1.3 Groups facing the most transport difficulties in the community

This subsection identifies population groups that experience the greatest transport difficulties, based on responses from the Household Survey. Identifying affected groups helps highlight equity issues and guides targeted transport interventions.

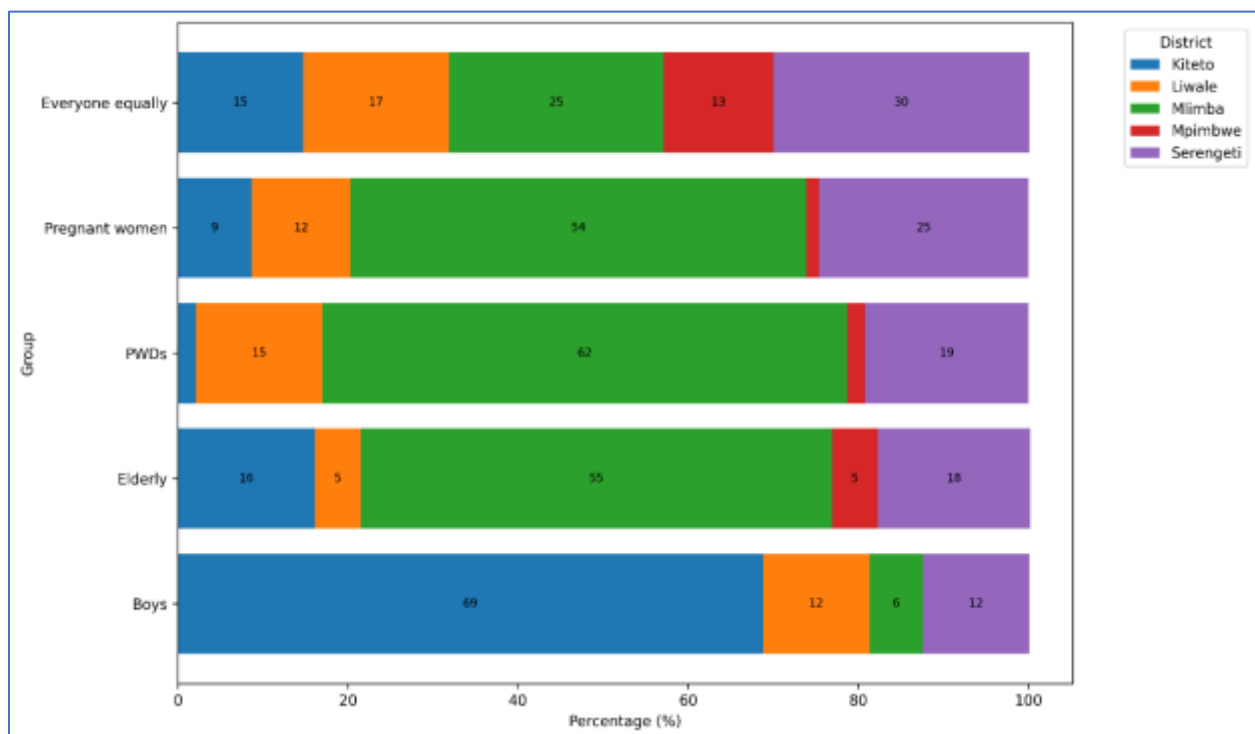


Figure 18: Groups Facing the Most Transport Difficulties in the Community

Figure 18 shows that transport difficulties are not uniformly distributed across the community but are concentrated among specific vulnerable groups, particularly in certain districts. Mlimba stands out as the district where most vulnerable groups are heavily affected, accounting for the majority of responses for the elderly (55.4%), persons with disabilities (61.7%), and pregnant women (53.6%). Persons with disabilities



and pregnant women emerge as particularly affected groups, reflecting mobility limitations and increased vulnerability to poor road conditions and lack of reliable transport. The elderly are also significantly impacted, especially in Mlimba and Serengeti, indicating challenges related to age and reduced physical mobility. While a share of respondents (25.2% in Mlimba and 30.1% in Serengeti) indicated that everyone is affected equally, this perception is less dominant compared to earlier findings and appears to reflect broader systemic challenges rather than uniform impact. Instead, the data clearly shows that certain groups face disproportionately higher difficulties. Overall, the results indicate that although transport challenges affect the wider community, vulnerable groups particularly persons with disabilities, pregnant women, and the elderly experience more severe barriers. This highlights the need for targeted, inclusive transport interventions that address the specific mobility and accessibility needs of these groups

Disproportionate Burden on Vulnerable Groups

Pregnant women, elderly persons, persons with disabilities, and schoolchildren were consistently identified as the groups most affected by transport challenges.

A women's participant from Lindi Region observed:

"Pregnant women suffer the most because they cannot walk or use motorcycles safely." — FGD Participant, Lindi Region

Similarly, a participant with a disability from Katavi Region described persistent exclusion:

"For people with disabilities, transport is almost impossible." — FGD Participant (Person with Disability), Katavi Region

Transport constraints therefore reinforce existing social vulnerabilities. Limited mobility options and unsafe infrastructure disproportionately affect individuals with reduced physical mobility or urgent service needs, deepening inequalities in access to healthcare, education, and economic opportunities.

6.2.1.4 Frequency of transport unavailability when needed

This subsection examines how often households are unable to find transport when needed, based on survey responses. Transport availability reflects the reliability of services and everyday mobility.

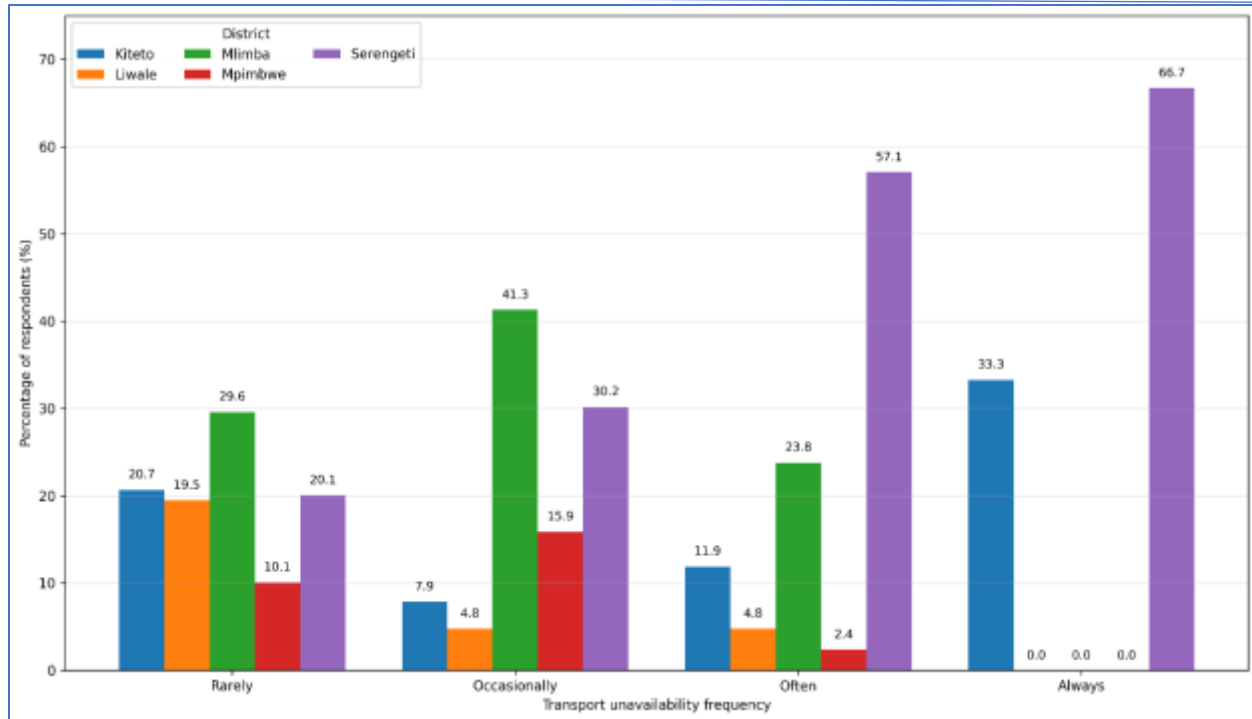


Figure 19: Frequency of Transport Unavailability When Needed

The findings in figure 19 show mixed reliability of transport services across districts. A number of households report that transport is rarely unavailable, particularly in Mlimba (29.6%), Kiteto (20.7%), and Serengeti (20.1%), suggesting relatively better access in some cases. However, a significant share of household's experiences occasional or frequent unavailability, especially in Mlimba (41.3% occasionally, 23.8% often) and Serengeti (30.2% occasionally, 57.1% often), indicating recurring access challenges. Notably, Serengeti (66.7%) and Kiteto (33.3%) report cases where transport is always unavailable, highlighting severe reliability issues in certain areas. In contrast, Liwale and Mpimbwe show lower levels of frequent unavailability, though occasional gaps still exist. Overall, while transport is available for some households, many still face regular or persistent unavailability, particularly in Serengeti and Mlimba, reflecting ongoing challenges in transport reliability.

Transport Unavailable During Emergencies and Rainy Seasons

Transport unavailability was widely reported, particularly at night, during heavy rainfall, or in emergency situations. Respondents described long waiting times, cancelled trips, and complete service withdrawal under adverse conditions.

A participant from Mara Region explained the limitations of nighttime mobility:

"If night comes, you stay where you are." — FGD Participant, Mara Region



The absence of dependable, on-demand transport creates critical access gaps during emergencies. This unpredictability compounds risk, delays urgent care, and increases uncertainty for households already facing infrastructure-related challenges.

6.2.1.5 Actions taken when transport is unavailable

This subsection examines how households cope when transport services are unavailable, based on survey responses. These coping strategies reflect the severity of transport gaps and their impact on daily activities.

Table 23: Actions Taken When Transport Is Unavailable

District	Walk (%)	Delay (%)	Borrow (%)	Cancel (%)	Animal cart (%)	Other (%)	Total (%)
Kiteto	17.1	6.6	31.7	11.1	0	0	16.6
Liwale	17.8	1.6	10	44.4	100	17.7	13.7
Mlimba	10.9	67.2	38.3	11.1	0	41.2	31.1
Mpimbwe	6.2	18	10	11.1	0	11.8	10.1
Serengeti	48.1	6.6	10	22.2	0	29.4	28.5
Total	100	100	100	100	100	100	100

The findings in table 23 show that households use different coping strategies depending on location, with no single response dominating across all districts. Walking is common, especially in Serengeti (48.1%) and also present in Kiteto and Liwale, indicating reliance on physically demanding alternatives. Delaying trips is particularly high in Mlimba (67.2%), suggesting that many households postpone activities when transport is unavailable. Borrowing bicycles or motorcycles is also important, especially in Kiteto (31.7%) and Mlimba (38.3%), reflecting informal coping mechanisms. In Liwale (44.4%), a large share of households cancels trips, indicating more severe access constraints. Overall, the results show that households adopt multiple strategies mainly walking, delaying, or borrowing to cope with transport shortages, highlighting the impact of limited and unreliable transport services on daily life.

Walking, Carrying Patients, and Waiting

When transport is unavailable, residents reported resorting to walking long distances, manually carrying patients, or postponing travel until services become available.

A participant from Manyara Region described this coping mechanism:

“Sometimes we carry the patient until we reach where vehicles can pass.” — FGD Participant, Manyara Region



These coping strategies are physically demanding, unsafe, and often result in significant delays in accessing essential services. The need to improvise mobility solutions reflects systemic transport gaps rather than isolated service disruptions.

6.2.1.6 Seasonal increase in transport fares during rainy or bad weather

This subsection examines whether transport fares change during the rainy season or periods of bad weather, based on survey responses. Changes in fares reflect the cost impact of poor road conditions on households.

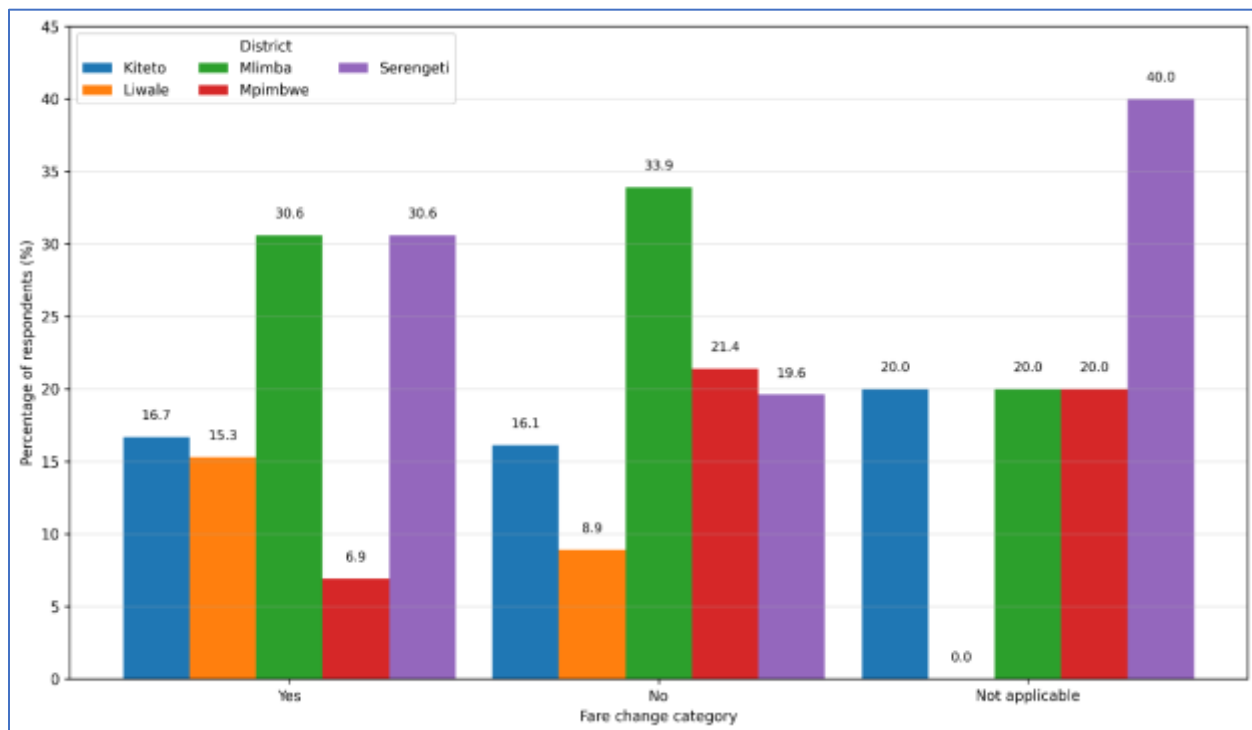


Figure 20: Changes in Transport Fares During Rainy Season or Bad Weather

The findings figure 20 show that transport fare changes during bad weather vary across districts. A higher share of households reporting increased fares is observed in Mlimba (30.6%) and Serengeti (30.6%), indicating stronger cost impacts in these areas. In contrast, some households report no change in fares, particularly in Mlimba (33.9%) and Mpimbwe (21.4%), suggesting mixed experiences. A notable proportion of respondents, especially in Serengeti (40.0%), indicated that paid transport is not applicable, reflecting reliance on non-motorized or informal means. Overall, the results suggest that while fare increases occur in several areas, the impact is not uniform, though households in some districts still face higher transport costs during rainy or difficult conditions.

Rainy Season Fare Inflation

Transport fares were widely reported to increase during the rainy season, reflecting higher operating risks, vehicle damage, and reduced service frequency.



A youth participant from Morogoro Region explained:

“A normal fare doubles when it rains.” — FGD Participant, Morogoro Region

Seasonal fare increases significantly reduce affordability and discourage necessary travel, particularly for low-income households. As costs rise, households may delay seeking healthcare, reduce market participation, or forgo other essential trips.

6.2.1.7 Missed school, work, or medical care due to transport problems

This subsection examines whether transport challenges have caused households to miss essential activities such as school, work, or medical care, based on survey responses. This reflects the broader social and economic impact of transport constraints.

Table 24: Missed School, Work, or Medical Care Due to Transport Problems

District	Yes (%)	No (%)	Total (%)
Kiteto	14.3	18.2	16.6
Liwale	19.6	9.7	13.7
Mlimba	31.3	30.9	31.1
Mpimbwe	3.6	14.6	10.1
Serengeti	31.3	26.7	28.5
Total	100	100	100

The findings in table 24 show that transport challenges have affected access to essential services in several districts. The highest proportions of households reporting missed activities are in Mlimba (31.3%) and Serengeti (31.3%), indicating significant disruption to daily life. Liwale (19.6%) and Kiteto (14.3%) also report notable impacts, suggesting that transport problems affect a meaningful share of households in these areas. In contrast, Mpimbwe (3.6%) reports lower levels of disruption, though some households are still affected. Overall, the results indicate that transport challenges continue to interfere with access to school, work, and healthcare, particularly in districts like Mlimba and Serengeti, highlighting the broader social and economic consequences of limited transport access.

Routine Disruptions to Essential Activities

Respondents frequently reported missed school days, delayed work activities, and postponed healthcare appointments due to transport challenges.

A participant from Mara Region explained the impact on children:



“Children stay home when bridges are flooded.” — FGD Participant, Mara Region

Transport unreliability therefore extends beyond mobility inconvenience. It directly disrupts education continuity, limits timely healthcare access, and reduces household productivity, reinforcing the broader socio-economic consequences of weak rural transport systems.

6.2.1.8 Most reliable means of transport in the area

This subsection identifies the transport means households consider most reliable, based on survey responses. Perceived reliability reflects availability, ability to operate under poor road conditions, and consistency of service.

Table 25: Most Reliable Means of Transport in the Area

District	Walking (%)	Bicycle (%)	Motorcycle (%)	Bus/Minibus (%)	Other (%)	Total (%)
Kiteto	24.1	2.2	22	7.9	0	16.6
Liwale	1.9	4.4	18.2	29	0	13.7
Mlimba	18.5	68.9	18.9	31.6	100	31.1
Mpimbwe	9.3	20	6.1	15.8	0	10.1
Serengeti	46.3	4.4	34.9	15.8	0	28.5
Total	100	100	100	100	100	100

The findings in table 25 show that perceived reliability of transport means varies across districts. Walking is most relied upon in Serengeti (46.3%) and Kiteto (24.1%), reflecting dependence on non-motorized options where services are limited. Bicycles are considered most reliable in Mlimba (68.9%), indicating strong reliance on low-cost and flexible transport. Motorcycles are also important, particularly in Serengeti (34.9%) and Kiteto (22.0%), suggesting their ability to operate on poor roads. Bus or minibus services are most relied upon in Liwale (29.0%) and Mlimba (31.6%), though overall reliance on formal transport remains moderate. Overall, the results indicate that households depend more on flexible and informal transport means such as walking, bicycles, and motorcycles, while formal public transport is less consistently reliable across many areas.

Motorcycles as the Default Option

Motorcycles (bodaboda) were consistently identified as the most dependable means of transport in rural areas, particularly where road conditions limit access for larger vehicles.

A district-level official from Morogoro Region noted:



“Motorcycles reach where vehicles cannot.” — Interview respondent, Morogoro Region

Motorcycles therefore function as the backbone of rural mobility. However, while they provide flexibility and reach, they also present limitations in terms of safety, passenger comfort, and inclusivity especially for elderly persons, pregnant women, and persons with disabilities.

6.2.1.9 Areas cut off during the rainy season

This subsection examines whether parts of villages become completely inaccessible during the rainy season, based on household survey responses. Seasonal isolation reflects transport vulnerability and limits access to essential services.

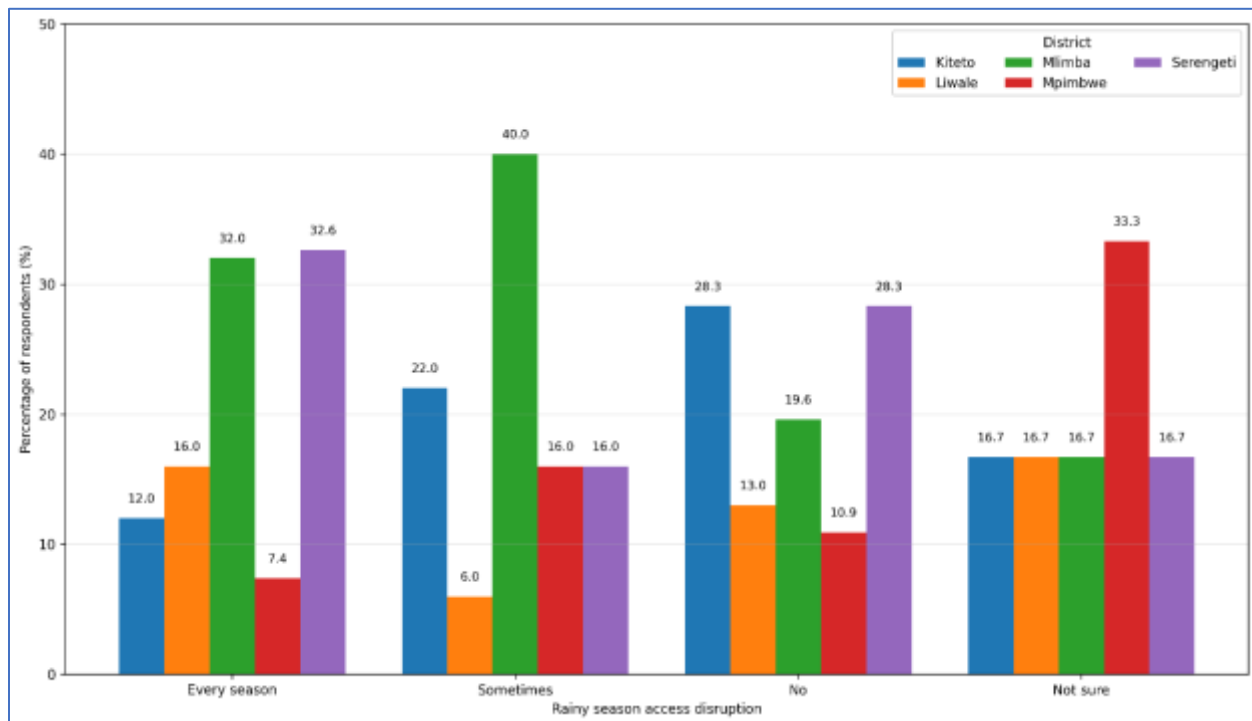


Figure 21: Areas Cut Off During the Rainy Season

The findings in figure 21 show that seasonal isolation is common in several districts, though its extent varies. Mlimba (32.0%) and Serengeti (32.6%) report the highest shares of areas cut off every rainy season, indicating frequent disruption of access. A large proportion of households in Mlimba (40.0%) also report areas being cut off sometimes, suggesting recurring seasonal challenges. In contrast, some households report no seasonal isolation, particularly in Kiteto (28.3%) and Serengeti (28.3%), though these are not the majority. A notable share of respondents, especially in Mpimbwe (33.3%), reported being unsure, which may reflect variability in access or limited awareness. Overall, the results indicate that many communities experience partial or complete isolation during rainy periods, especially in Mlimba and Serengeti, highlighting the vulnerability of rural transport systems to seasonal conditions.



Seasonal Isolation of Entire Villages

Respondents reported that some villages and sub-villages become completely inaccessible during the rainy season. Flooded crossings, washed-away culverts, and impassable mud sections were described as common causes of total isolation.

A community representative from Lindi Region explained:

“Some villages are totally cut off.” — Community Representative, Lindi Region

Seasonal isolation significantly disrupts service delivery and emergency response. Health outreach, education services, and market activities are interrupted, leaving affected communities temporarily disconnected from essential support systems.

6.2.1.10 Seasonal interruption of access to markets

This subsection examines how seasonal factors such as rain and floods interrupt access to markets, based on household survey responses. These interruptions reflect the reliability of transport routes and their resilience to weather conditions.

Table 26: Seasonal Interruption of Access to Markets

District	Frequently (%)	Occasionally (%)	Rarely (%)	Never (%)	Total (%)
Kiteto	12	15.6	22.1	19.4	16.6
Liwale	15.2	0	16.9	35.5	13.7
Mlimba	35.9	52	15.6	3.2	31.1
Mpimbwe	4.4	7.8	18.2	12.9	10.1
Serengeti	32.6	24.7	27.3	29	28.5
Total	100	100	100	100	100

The findings in table 26 show that seasonal interruption of market access is common in several districts. Mlimba records the highest levels, with 35.9% reporting frequent interruptions and 52.0% occasional interruptions, indicating strong dependence on weather-sensitive routes. Serengeti (32.6%) also reports a high share of frequent interruptions, alongside moderate occasional disruptions, suggesting recurring access challenges. In contrast, Liwale shows a higher share of households reporting no interruption (35.5%), indicating relatively more stable access in some areas. Kiteto and Mpimbwe show mixed patterns, with interruptions occurring but less frequently compared to Mlimba and Serengeti. Overall, the results indicate that many households face regular seasonal barriers to market access, particularly in Mlimba and Serengeti, which can disrupt economic activities and limit reliable participation in markets.



Market Access Severely Affected

Farmers consistently reported being unable to transport produce during the rainy season due to impassable roads and limited vehicle access.

A participant from Katavi Region explained:

“Crops spoil because vehicles cannot reach us.” — FGD Participant, Katavi Region

Transport barriers therefore translate directly into income loss, post-harvest spoilage, and heightened food insecurity. Poor road conditions disrupt supply chains, reduce bargaining power, and limit farmers’ ability to access profitable markets.

6.2.1.11 Frequency of trip delays caused by road conditions

This subsection examines how often poor road conditions cause delays in transport operations, based on responses from transport service providers. Trip delays reflect the impact of road quality on travel time and service reliability.

Table 27: Frequency of Trip Delays Caused by Road Conditions

District	Daily (%)	Weekly (%)	Monthly (%)	Rarely (%)	Never (%)	Total (%)
Kiteto	10.8	33.3	0	60	66.7	32.1
Liwale	0	0	0	3.3	0	1.3
Mlimba	70.3	0	20	6.7	0	37.2
Mpimbwe	8.1	33.3	80	20	0	18
Serengeti	10.8	33.3	0	10	33.3	11.5
Total	100	100	100	100	100	100

The findings in table 27 show that road conditions cause frequent delays in several districts, though patterns differ. Mlimba (70.3%) has the highest share of daily delays, indicating severe and consistent disruption to transport operations. In Mpimbwe, delays are more spread across weekly (33.3%) and monthly (80.0%), suggesting periodic but significant interruptions. Kiteto shows a mixed pattern, with many providers reporting weekly delays (33.3%), while a large share also reports delays occurring rarely. Serengeti also records notable weekly delays (33.3%), though some respondents report that delays never occur, indicating variability across routes. Overall, the results indicate that poor road conditions regularly disrupt transport operations, especially in Mlimba, reducing travel efficiency and affecting the reliability of transport services.



6.2.1.12 Avoidance of service areas due to unsafe or unprofitable road conditions

This subsection examines whether transport service providers avoid serving certain areas due to unsafe road conditions or low profitability. Such avoidance highlights gaps in transport coverage and access.

Table 28: Areas Avoided by Transport Providers Due to Road Safety or Profitability Concerns

District	Yes, many areas (%)	Yes, a few areas (%)	No (%)	Total (%)
Kiteto	18.5	60	75	32.1
Liwale	1.9	0	0	1.3
Mlimba	50	10	0	37.2
Mpimbwe	16.7	20	25	18
Serengeti	13	10	0	11.5
Total	100	100	100	100

The findings in table 28 show that avoidance of certain areas is common among transport providers, though the extent differs across districts. Mlimba (50.0%) has the highest share of providers avoiding many areas, indicating serious safety or profitability challenges. In Kiteto, most providers report avoiding a few areas (60.0%), suggesting partial service coverage rather than complete exclusion. Mpimbwe shows a mixed pattern, with some providers avoiding areas and others not, indicating variation in road conditions and service viability. In contrast, Liwale and Serengeti show limited responses in the “no avoidance” category, suggesting that avoidance is still present in these areas. Overall, the results indicate that many transport providers restrict their service areas due to unsafe or unprofitable conditions, which limits transport availability and leaves some communities underserved.

6.2.1.13 Abandonment or cancellation of trips due to road conditions

This subsection examines whether transport service providers have abandoned or canceled trips due to road conditions over the past six months. Trip cancellation reflects service unreliability and the impact of road quality on transport operations.

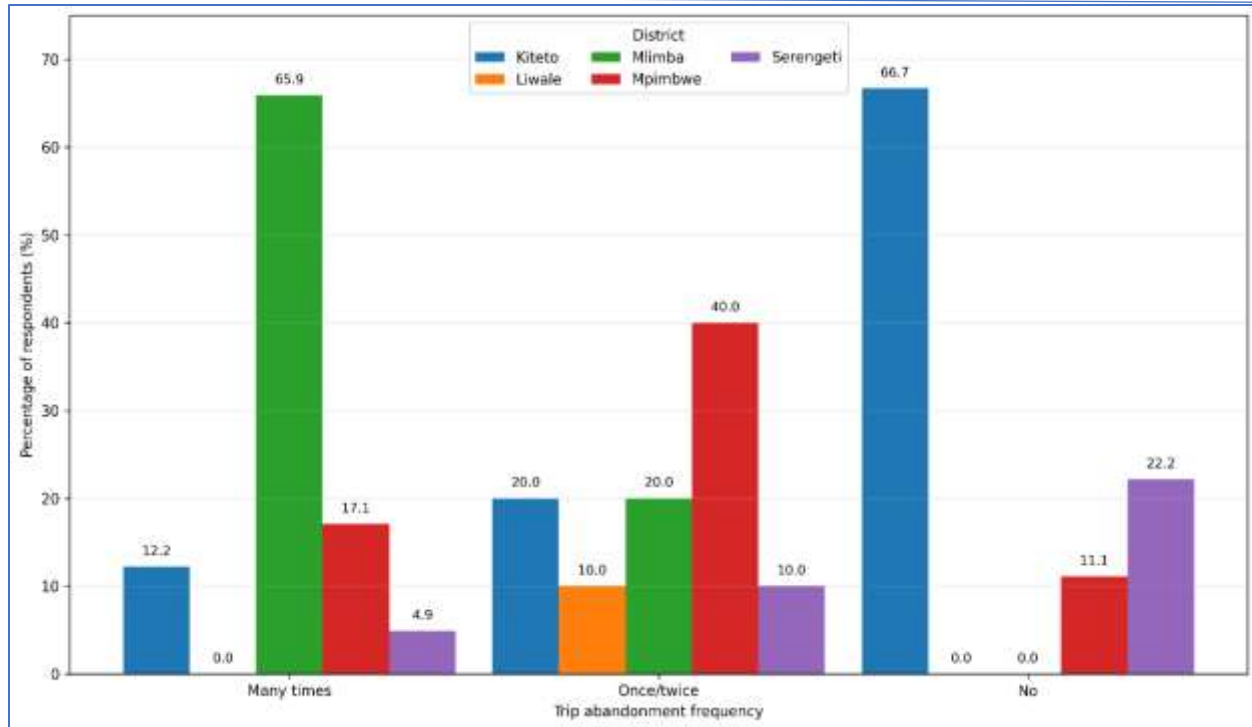


Figure 22: Trip Abandonment or Cancellation Due to Road Conditions (Past 6 Months)

The findings in figure 22 show that trip cancellation due to road conditions is common in several districts. Mlimba (65.9%) has the highest share of providers reporting cancellations many times, indicating frequent service disruption. In Mpimbwe, most providers report canceling trips once or twice (40.0%), suggesting occasional but notable interruptions. Kiteto shows a different pattern, where a majority (66.7%) report no cancellations, although some providers still experience disruptions. Serengeti also shows mixed responses, with some providers reporting cancellations and others reporting none. Overall, the results indicate that poor road conditions lead to frequent or occasional trip cancellations, particularly in Mlimba, reducing transport reliability and limiting service availability for users.

6.2.1.14 Affordability of rural transport for residents

This subsection assesses how transport service providers perceive the affordability of rural transport for residents. Affordability affects transport use, access to services, and overall mobility.

Table 29: Transport Service Providers' Rating of Rural Transport Affordability

District	Very affordable (%)	Somewhat affordable (%)	Not affordable (%)	Very expensive (%)	Not sure (%)	Total (%)
Kiteto	62.5	47.8	36.4	14.3	0	32.1
Liwale	12.5	0	0	0	0	1.3



District	Very affordable (%)	Somewhat affordable (%)	Not affordable (%)	Very expensive (%)	Not sure (%)	Total (%)
Mlimba	0	8.7	9.1	74.3	0	37.2
Mpimbwe	12.5	26.1	36.4	5.7	100	18
Serengeti	12.5	17.4	18.2	5.7	0	11.5
Total	100	100	100	100	100	100

The findings in table 29 show that perceptions of transport affordability vary across districts, but concerns about high costs are evident in several areas. Mlimba stands out, with a large share (74.3%) rating transport as very expensive, indicating serious affordability challenges. In Kiteto, responses are more mixed, with many providers rating transport as very or somewhat affordable, though a notable share still consider it not affordable. Mpimbwe shows a diverse pattern, including a significant proportion reporting transport as not affordable (36.4%), alongside uncertainty among some respondents. Serengeti and Liwale report lower shares of extreme cost concerns, though affordability challenges still exist for some households. Overall, the results suggest that while affordability varies, high transport costs remain a key barrier in several districts, particularly in Mlimba, limiting access and mobility for rural residents.

6.2.1.15 Increase in transport fares due to fuel or road-related costs

This subsection examines whether transport service providers have increased fares due to fuel prices or road-related operating costs. These changes reflect cost pressures that affect affordability for users.

Table 30: Fare Increases Due to Fuel or Road-Related Costs

District	Yes, frequently (%)	Yes, once/twice (%)	No (%)	Not applicable (%)	Total (%)
Kiteto	16.7	75	57.1	0	32.1
Liwale	1.9	0	0	0	1.3
Mlimba	51.9	6.3	0	0	37.2
Mpimbwe	18.5	12.5	28.6	0	18
Serengeti	11.1	6.3	14.3	100	11.5
Total	100	100	100	100	100

The findings in table 30 show that fare increases due to fuel and road-related costs are common in several districts, though patterns vary. Mlimba (51.9%) records the highest share of providers reporting frequent fare increases, indicating strong cost pressures. In Kiteto, most providers report increasing fares once or twice



(75.0%), suggesting periodic adjustments rather than constant changes. Mpimbwe shows mixed responses, with some providers increasing fares while others report no change. In Serengeti, a notable share indicated a fixed fare system (100.0%), meaning fare adjustments may be limited despite cost changes. Overall, the results indicate that many transport providers adjust fares due to rising costs, particularly in Mlimba and Kiteto, contributing to higher and sometimes unstable transport costs for rural users.

6.2.1.16 Groups that struggle most to pay transport fares

This subsection identifies population groups that face the greatest difficulty in affording transport fares, based on responses from Transport Service Providers. Identifying these groups helps highlight affordability-related transport gaps and equity concerns.

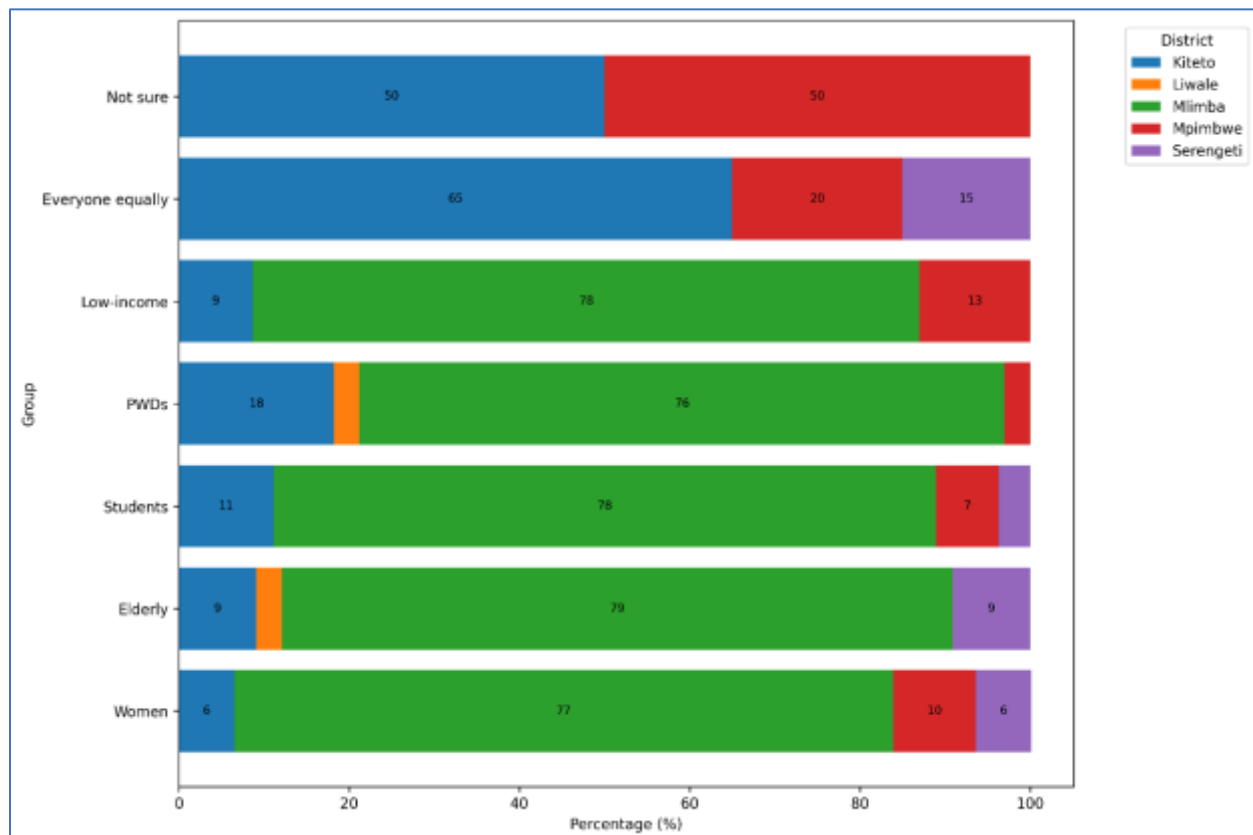


Figure 23: Groups That Struggle Most to Pay Transport Fares

Figure 23 show that affordability challenges are heavily concentrated in Mlimba, which accounts for the majority of responses across almost all vulnerable groups. In particular, Mlimba contributes the largest share of responses identifying women (77.4%), elderly persons (78.8%), students (77.8%), persons with disabilities (75.8%), and low-income households (78.3%) as groups struggling to afford transport fares. This indicates that transport affordability is a significant concern in this district. Other districts contribute relatively smaller shares. In Kiteto, responses are more dispersed, with notable mentions across different groups, including persons with disabilities (18.2%) and students (11.1%). Mpimbwe shows moderate representation, particularly for low-income households (13.0%) and women (9.7%), while Serengeti contributes smaller



shares across most categories. In contrast, Liwale shows minimal reporting across most groups, reflecting either lower reported affordability concerns or a smaller sample size of respondents. Interestingly, a large share of respondents in Kiteto (65.0%) indicated that everyone struggles equally, suggesting a perception that transport costs affect all population groups rather than specific vulnerable categories. Similarly, responses categorized as “not sure” are split between Kiteto and Mpimbwe Overall, the findings indicate that while affordability challenges affect multiple population groups, they are particularly pronounced in certain districts, with vulnerable groups such as women, elderly persons, persons with disabilities, and low-income households being most affected. This highlights persistent equity concerns in access to transport services.

6.2.1.17 Effect of regulations on transport service providers’ operations

This subsection examines how existing regulations affect the ability of transport service providers to operate, based on their responses. Regulatory impact influences service availability, compliance costs, and operational flexibility.

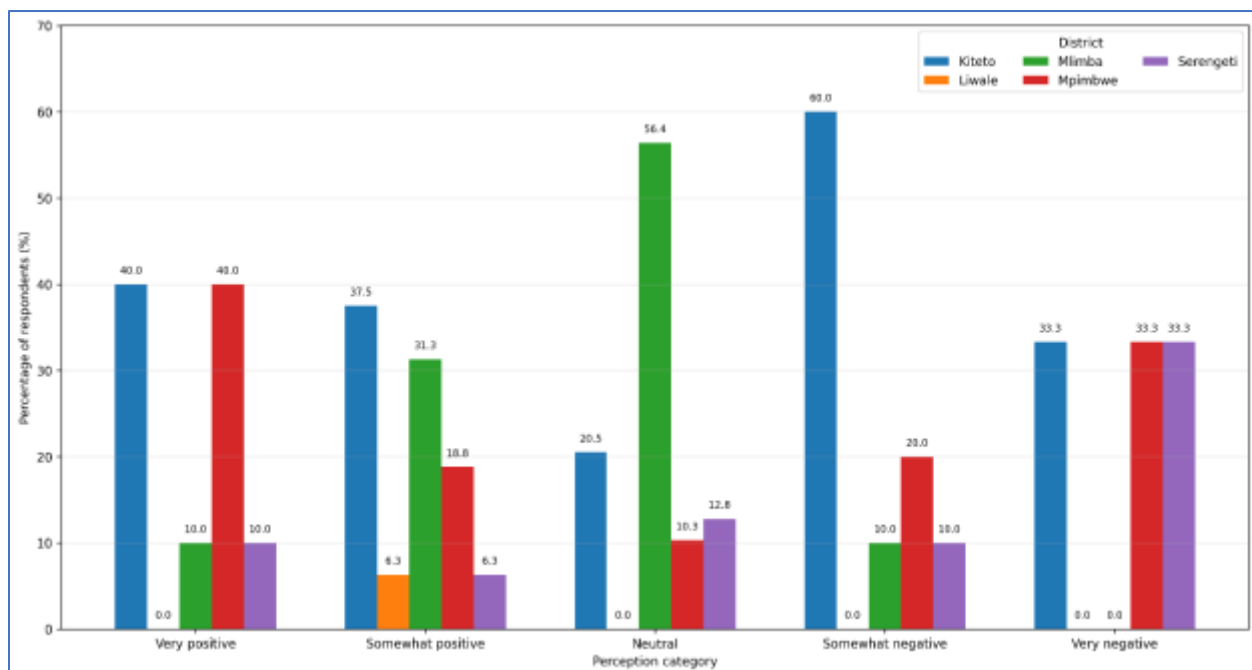


Figure 25: Impact of Regulations on Transport Service Providers’ Ability to Operate

The findings in figure 25 show that the effect of regulations on transport operations is mixed across districts. A large share of providers in Mlimba (56.4%) report a neutral impact, suggesting regulations are not a major constraint in that area. In Kiteto and Mpimbwe, many providers report positive effects, indicating that regulations may support operations for some groups. However, there are also notable reports of negative impacts, particularly in Kiteto (60.0% somewhat negative) and Mpimbwe and Serengeti (33.3% very negative each), suggesting that regulations can limit operations in certain contexts. Overall, the results indicate that while regulations influence operations, their impact is not uniform. In many cases, providers view them as neutral or moderately positive, while infrastructure and operating costs likely remain more significant challenges.



6.2.1.18 Regulatory challenges faced by transport service providers

This subsection examines the key regulatory challenges affecting transport service providers, based on their responses. Understanding these challenges helps explain non-infrastructure barriers that influence service reliability, operating costs, and operators' willingness to serve certain areas.

Table 31: Regulatory Challenges Faced by Transport Service Providers

Category	Kiteto (%)	Liwale (%)	Mlimba (%)	Mpimbwe (%)	Serengeti (%)	Total (%)
High permit fees	0	0	76.9	23.1	0	100
Frequent police checks	20.8	4.2	62.5	8.3	4.2	100
Unfair fines	19.1	0	64.3	9.5	7.1	100
Lack of clear regulation	0	0	88.9	11.1	0	100
None	56.5	0	4.4	17.4	21.7	100
Other	—	—	—	—	—	—
Total	23.4	0.9	55	12.6	8.1	100

Table 31 shows that regulatory challenges are highly concentrated in specific districts, particularly Mlimba, which accounts for the majority of reported issues across nearly all categories. For instance, lack of clear regulation is reported almost entirely in Mlimba (88.9%), while high permit fees (76.9%), unfair fines (64.3%), and frequent police checks (62.5%) are also predominantly reported in the same district. Enforcement-related challenges especially unfair fines and frequent police checks stand out as key concerns. These issues contribute to increased operational costs, delays, and uncertainty for transport providers. Administrative barriers, such as high permit fees and unclear regulatory frameworks, further compound these challenges in certain areas. In contrast, a significant proportion of providers in Kiteto (56.5%) reported facing no regulatory challenges, indicating that regulatory burdens are uneven and context-specific rather than uniform across all districts. Overall, the findings suggest that regulatory challenges are not widespread but are heavily localized, with enforcement practices and administrative inefficiencies disproportionately affecting certain districts. This uneven regulatory environment may discourage service provision in already underserved areas and underscores the need for clearer, more consistent, and balanced regulatory systems.

6.2.1.19 Observed presence of road obstructions

This subsection presents findings from direct field observations on the presence and severity of road obstructions. Such obstructions affect vehicle movement, travel time, and overall road usability.



Table 32: Observed Visible Road Obstruction

District	None (%)	Minor (%)	Severe (%)	Total (%)
Kiteto	11.8	0	0	8.7
Liwale	17.7	50	50	26.1
Mlimba	29.4	0	25	26.1
Mpimbwe	17.7	50	25	21.7
Serengeti	23.5	0	0	17.4
Total	100	100	100	100

The observations in table 32 show that road obstructions are present in several areas, though their severity varies by district. Some locations, such as Mlimba (29.4%) and Serengeti (23.5%), report roads with no visible obstructions, indicating relatively clear routes at the time of observation. However, minor obstructions are common in Liwale and Mpimbwe (50.0% each), suggesting partial disruption to movement. More concerning are severe obstructions, particularly in Liwale (50.0%), Mlimba (25.0%), and Mpimbwe (25.0%), which can significantly limit accessibility. Overall, the findings indicate that while some roads appear clear, a notable share experience minor or severe obstructions, which can disrupt transport, especially during adverse conditions.

6.2.1.20 Observed Road sections affected by erosion or wash-away

This subsection assesses whether there is visible evidence of road sections being submerged or washed away, based on direct field observations. Such damage reflects vulnerability to flooding and poor drainage conditions.

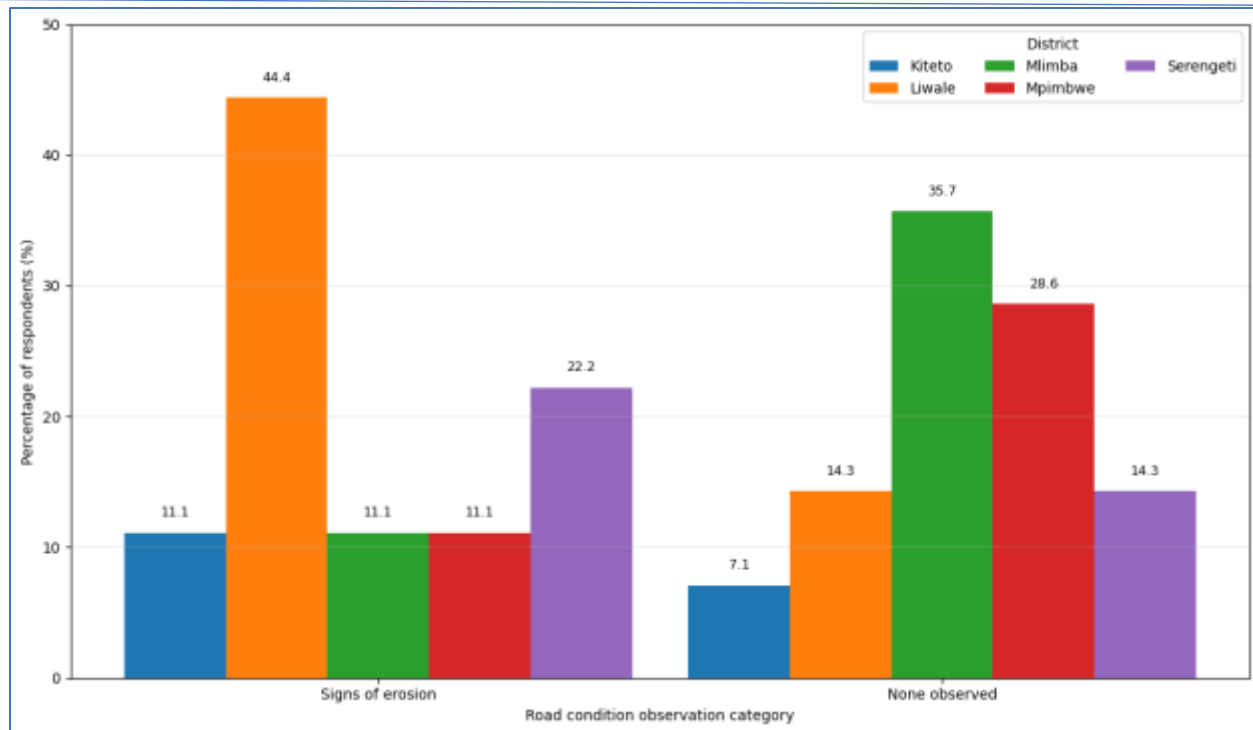


Figure 26: Observed Evidence of Road Sections Submerged or Washed Away

The observations in figure 26 show that erosion and wash-away are present in several districts, though not uniformly. Liwale (44.4%) records the highest share of roads with visible erosion, indicating strong exposure to water damage. Serengeti (22.2%) also shows notable signs of erosion, while Kiteto, Mlimba, and Mpimbwe (11.1% each) report lower but still present levels. At the same time, some areas show no visible damage, particularly in Mlimba (35.7%) and Mpimbwe (28.6%), suggesting better conditions at the time of observation. Overall, the findings indicate that a significant portion of roads are affected by erosion, especially in Liwale and Serengeti, which can lead to deterioration and reduced accessibility, particularly during rainy seasons.

6.2.1.21 Observed transport user difficulties

This subsection presents findings from direct field observations on whether transport users were experiencing difficulties while using the roads. These observations provide practical evidence of how road conditions affect everyday mobility.

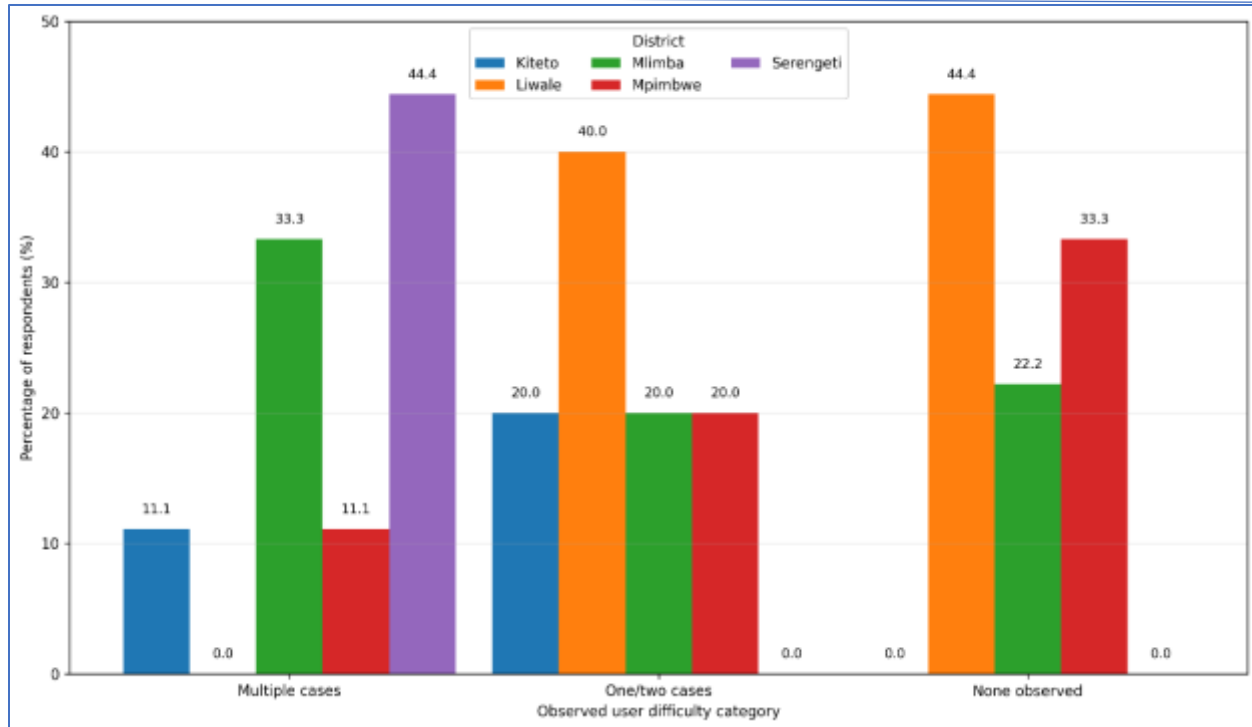


Figure 27: Observed Transport User Difficulties

The observations in figure 27 show that transport user difficulties are common in several districts, though the intensity varies. Serengeti (44.4%) and Mlimba (33.3%) report the highest shares of multiple cases, indicating frequent and visible challenges for users. In Kiteto and Mpimbwe, some difficulties are observed, mainly as one or two cases (20.0%), suggesting moderate issues. In contrast, Liwale (44.4%) and Mpimbwe (33.3%) report a higher share of no observed difficulties, indicating relatively better conditions in some locations. Overall, the findings indicate that many road users experience some level of difficulty, particularly in Serengeti and Mlimba, confirming that road conditions continue to affect safe and efficient movement in rural areas.

6.2.1.22 Observed presence of michomoko (informal private-hire vehicles)

This subsection presents findings from direct field observations on the presence of michomoko (informal private-hire vehicles). Their presence reflects local demand for flexible transport and gaps in formal services.

Table 33: Observed Presence of Michomoko in the Area

District	Yes, many (%)	Yes, a few (%)	None observed (%)	Total (%)
Kiteto	0	20	5.9	8.7
Liwale	0	20	29.4	26.1
Mlimba	0	20	29.4	26.1



Mpimbwe	100	20	17.7	21.7
Serengeti	0	20	17.7	17.4
Total	100	100	100	100

The observations in table 33 show that michomoko are present in some areas but not widespread. Mpimbwe (100.0%) stands out with a high presence of many vehicles, indicating stronger informal transport activity. In most districts, michomoko are observed only in small numbers (20.0%), including Kiteto, Liwale, Mlimba, and Serengeti, suggesting limited but existing informal services. At the same time, a considerable share of locations reports no michomoko observed, especially in Liwale and Mlimba (29.4%), indicating gaps in service availability. Overall, the findings suggest that while michomoko provide some level of flexible transport, their presence remains limited in many areas, reflecting constraints such as road conditions, demand, or operating challenges.

6.2.1.23 Observed informal staging of michomoko (informal private-hire vehicles)

This subsection examines whether michomoko are observed waiting or staging in informal, undesignated areas, based on field observations. Informal staging reflects gaps in transport facilities and service organization.

Table 34: Observed Informal Staging of Michomoko

District	Yes, occasional (%)	No staging observed (%)	Total (%)
Kiteto	20	5.6	8.7
Liwale	20	27.8	26.1
Mlimba	20	27.8	26.1
Mpimbwe	20	22.2	21.7
Serengeti	20	16.7	17.4
Total	100	100	100

The observations in figure 34 show that informal staging of michomoko occurs at a similar level across all districts, with 20.0% reporting occasional staging in each area. At the same time, many locations report no staging areas observed, particularly in Liwale and Mlimba (27.8%) and Mpimbwe (22.2%), indicating that such activity is not widespread. Overall, the findings suggest that while informal staging exists, it is limited and inconsistent, and where it occurs, it reflects the absence of designated facilities and the informal nature of transport services in rural areas.



6.3 Evaluate Community Impacts

6.3.1 Income & Livelihoods (Economic Impact)

This subsection examines how transport conditions influence household income and livelihoods, drawing on evidence from the Household Survey, Transport Service Providers, and field observations. The analysis focuses on the ways in which road quality, transport availability, and transport costs affect access to markets, employment opportunities, and income-generating activities. The findings show that poor road conditions and seasonal disruptions increase travel time and transport costs, limit market access, and reduce the reliability of transport services. These constraints affect both producers and traders by raising transaction costs, restricting the movement of goods, and reducing participation in economic activities. Overall, the results indicate that weak transport infrastructure has a direct negative effect on rural incomes and livelihoods, reinforcing economic vulnerability, particularly among low-income households and those dependent on regular market access.

6.3.1.1 Effect of transport availability on household income

This subsection examines how transport availability has affected households' ability to earn income, based on survey responses. Transport access influences market participation, employment, and movement of goods.

Table 35: Effect of Transport Availability on Household Income

District	Increased (%)	No change (%)	Decreased (%)	Not sure (%)	Total (%)
Kiteto	30.8	29	7.9	29	16.6
Liwale	0	9.7	18.3	5.3	13.7
Mlimba	23.1	37.1	31.7	21.1	31.1
Mpimbwe	15.4	6.5	9.2	18.4	10.1
Serengeti	30.8	17.7	32.9	26.3	28.5
Total	100	100	100	100	100

The findings in table 35 show that transport availability has mixed effects on household income across districts. A higher share of households reporting decreased income is observed in Serengeti (32.9%) and Mlimba (31.7%), indicating that transport challenges limit income-generating activities in these areas. Some households report no change, particularly in Mlimba (37.1%) and Kiteto (29.0%), suggesting that transport constraints do not affect all households equally. At the same time, a notable share report increased income, especially in Kiteto and Serengeti (30.8% each), possibly reflecting better access or adaptive strategies. A portion of respondents also report uncertainty, particularly in Kiteto and Serengeti, indicating varied



experiences. Overall, the results suggest that while some households benefit or remain unaffected, transport challenges are linked to reduced income in several districts, especially in Mlimba and Serengeti.

Mobility as a Direct Determinant of Earnings

Across regions, participants described transport availability as a central factor influencing household income, particularly through access to buyers, movement of goods, and the sustainability of small businesses. When roads or transport services fail, households experience immediate income disruptions, often leading to distress sales and reduced economic stability.

A community representative from Manyara Region summarized the structural impact:

“Road challenges affect income.” — Community Representative, Manyara Region

Participants from Morogoro Region further explained how transport costs and delays reduce earnings:

“A farmer may have sacks of rice but cannot transport them they are forced to sell at low prices locally.” — FGD Participant, Morogoro Region

Transport availability functions as an enabling condition for rural income generation. When transport becomes unreliable, households shift from planned market participation to coping strategies such as selling produce locally at reduced prices or foregoing income opportunities altogether.

6.3.1.2 Effect of poor roads on selling goods and accessing markets

This subsection examines whether poor road conditions affect households' ability to sell goods or access markets, based on survey responses. Market access is a key link between transport and livelihoods.

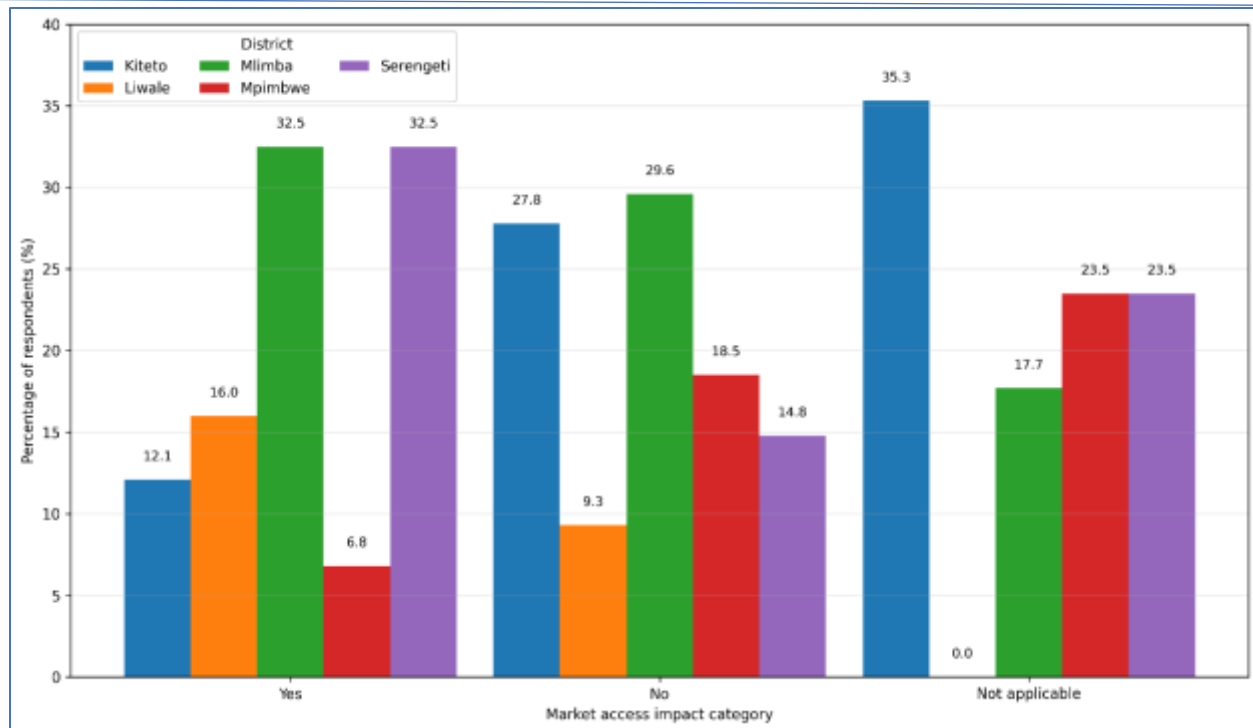


Figure 28: Effect of Poor Roads on Ability to Sell Goods or Access Market

The findings in figure 28 show that poor roads affect market access in several districts, though the extent varies. Mlimba (32.5%) and Serengeti (32.5%) report the highest shares of households affected, indicating strong constraints on selling goods and reaching markets. Liwale (16.0%) and Kiteto (12.1%) also report some impact, though at lower levels. At the same time, a number of households report no effect, especially in Kiteto (27.8%) and Mlimba (29.6%), suggesting mixed experiences. A notable share also reported the issue as not applicable, particularly in Kiteto (35.3%), which may reflect households less engaged in market-based activities. Overall, the results indicate that poor road conditions remain an important barrier to market access, particularly in Mlimba and Serengeti, affecting livelihoods and economic opportunities.

Market Exploitation and Spoilage as Recurring Themes

Poor road conditions were repeatedly linked to market exclusion and exploitation. Participants reported that traders and middlemen often cite high transport costs as justification for offering lower farmgate prices, while perishable goods are frequently lost due to delays, breakdowns, or impassable routes.

A community representative from Morogoro Region described how producers are disadvantaged:

“Traders buy crops at low prices, claiming transport costs are high. We are exploited.” — Community Representative, Morogoro Region

Youth participants from Katavi Region highlighted direct financial losses:



“The vehicle broke down for two days all the mangoes had spoiled.” — FGD Participant, Katavi Region

Poor road infrastructure contributes to a market power imbalance in which producers bear transport risks while buyers retain bargaining leverage. Recurring patterns of spoilage, delayed delivery, and reduced prices reflect a transport-induced vulnerability within rural value chains.

6.3.1.3 Effect of transport availability on access to agricultural activities

This subsection examines how transport availability affects households' access to agricultural activities, based on survey responses. Transport influences access to farms, inputs, labor, and markets.

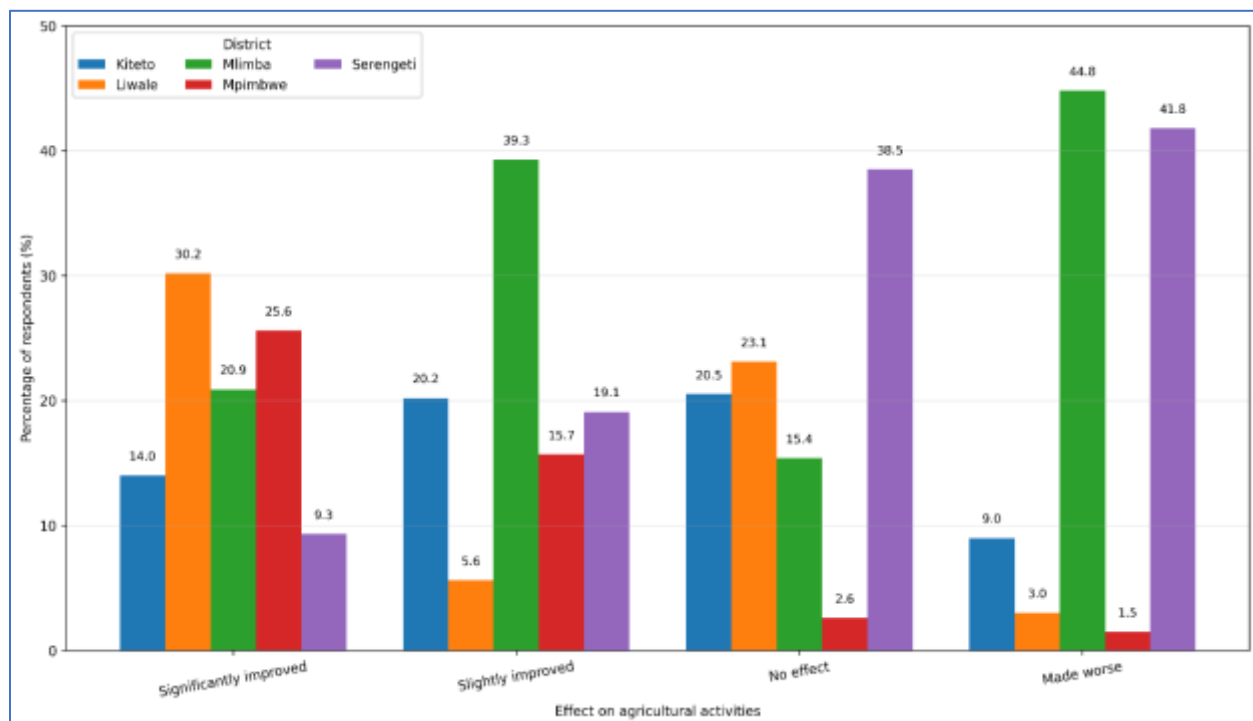


Figure 29: Effect of Transport Availability on Access to Agricultural Activities

The findings in figure 29 show mixed effects of transport on agricultural access across districts. Improvements are evident in Liwale (30.2% significantly improved) and Mpimbwe (25.6%), indicating better access in some areas. In Mlimba, many households report slight improvement (39.3%), but also a high share indicating that access has become worse (44.8%), suggesting uneven conditions. Serengeti also shows challenges, with a large proportion reporting that transport has made access worse (41.8%) and many experiencing no change. In Kiteto, responses are more balanced across all categories, indicating moderate impacts. Overall, the results suggest that while transport has improved agricultural access for some households, a significant share still faces constraints, particularly in Mlimba and Serengeti.

Production Continues but Output Mobility Fails



Participants noted that agricultural production itself often continues, even under poor infrastructure conditions. However, the ability to move produce to markets and access farm inputs was consistently described as the main constraint. While cultivation may take place near homesteads, unreliable transport weakens the financial returns from agricultural labor.

A community representative from Katavi Region explained:

“For transport of produce to markets, it is challenging. People may use tractors or carts, which are costly, and the cost affects their profits.” — Community Representative, Katavi Region

These findings indicate that transport availability influences not whether agriculture occurs, but whether it is economically viable. The central constraint is therefore not production capacity, but the mobility of outputs and access to functioning market systems.

6.3.1.4 Relative importance of transport compared to other community challenges

This subsection assesses how households rank transport challenges relative to other issues such as water, health, and education, based on survey responses. It reflects how transport is perceived within the broader development context.

Table 36: Importance of Transport Compared to Other Community Challenges

District	Most serious (%)	Top three (%)	Important (%)	Minor (%)	Total (%)
Kiteto	17.2	12.2	22.5	21.1	16.6
Liwale	15.6	6.7	10	42.1	13.7
Mlimba	28.9	41.1	30	0	31.1
Mpimbwe	9.4	14.4	5	5.3	10.1
Serengeti	28.9	25.6	32.5	31.6	28.5
Total	100	100	100	100	100

The findings in table 36 show that transport is widely recognized as an important challenge, though its priority varies across districts. Mlimba stands out, with 28.9% ranking transport as the most serious challenge and 41.1% placing it among the top three, indicating high concern. Serengeti also shows strong concern, with notable shares across all categories, including 28.9% identifying it as most serious. In Kiteto, transport is seen as important but more evenly distributed across categories, suggesting moderate concern. In contrast, Liwale has a higher share (42.1%) viewing transport as a minor issue, indicating that other challenges may be more pressing there. Overall, the results suggest that transport is a high-priority issue in several districts, particularly in Mlimba and Serengeti, though its relative importance differs depending on local conditions and competing needs.



Roads Described as the Foundation of Rural Life

Across all study areas, participants framed transport not as one challenge among many, but as the condition that determines whether other services such as healthcare, education, and markets can function at all.

A participant from Katavi Region expressed this hierarchy clearly:

“Roads are the foundation of everything.” — FGD Participant, Katavi Region

Transport therefore emerges as a foundational constraint that shapes the performance of other development sectors. Communities consistently interpreted road access as a prerequisite for effective service delivery, livelihood sustainability, and the realization of basic socio-economic rights.

6.3.1.5 Effect of michomoko and other private-hire services on travel frequency

This subsection examines how the presence of michomoko or other private-hire services has influenced household travel behavior, based on survey responses. Changes in travel frequency reflect their role in improving mobility.

Table 37: Effect of Michomoko and Other Private-Hire Services on Travel Frequency

District	Much more (%)	Slightly more (%)	No change (%)	Travel less (%)	Not applicable (%)	Total (%)
Kiteto	14.3	16.1	15.9	0	21.1	16.6
Liwale	17.1	8.1	6.8	31.8	14.9	13.7
Mlimba	5.7	37.1	40.9	27.3	32.5	31.1
Mpimbwe	37.1	17.7	6.8	4.6	0	10.1
Serengeti	25.7	21	29.6	36.4	31.6	28.5
Total	100	100	100	100	100	100

The findings in table 37 show that the effect of michomoko on travel frequency is mixed across districts. Increased travel is evident in Mpimbwe (37.1% much more) and Serengeti (25.7%), indicating improved mobility where services are available. In Mlimba, most households report no change (40.9%) or slight increase (37.1%), suggesting limited but present influence. Some households report reduced travel, particularly in Serengeti (36.4%) and Liwale (31.8%), possibly due to cost or service limitations. A notable share also reported not applicable, especially in Mlimba (32.5%) and Serengeti (31.6%), indicating uneven availability of these services. Overall, the results suggest that while michomoko can improve travel frequency in some areas, their impact remains uneven, and many households do not benefit due to limited coverage or access.



Informal Services Fill Gaps but Introduce Competition and Safety Concerns

In areas where formal transport services are limited, informal private-hire vehicles were described as an adaptive response that expands mobility options. These services help fill gaps in frequency and coverage, particularly in remote settlements.

A transport service provider from Katavi Region acknowledged their presence and impact:

“They exist, and many operate we compete for passengers.” — Interview respondent, Katavi Region

While informal services increase travel frequency and improve short-term accessibility, their unstructured nature can introduce operational tensions, uneven safety standards, and limited regulatory oversight. This suggests a dual role: informal transport functions both as a practical solution to service shortages and as an indicator of governance and coordination gaps within the rural transport system.

6.3.2 Education Access & Outcomes

This subsection examines how transport conditions affect access to education and related outcomes within the community. Reliable transport is critical for regular school attendance, timely arrival, and retention, especially for children traveling long distances. Evidence from the Household Survey and earlier access indicators shows that poor road conditions, seasonal inaccessibility, and limited transport availability contribute to missed school days and irregular attendance. When roads become impassable or transport is unavailable, students are forced to walk long distances, delay travel, or miss school entirely. These challenges disproportionately affect younger learners and households with limited resources. Overall, the data indicate that weak transport infrastructure undermines consistent access to education, with negative implications for learning continuity and educational outcomes.

6.3.2.1 Distance students travel to attend school

This subsection examines the distance students travel to reach school, based on survey responses. Distance influences attendance, punctuality, and exposure to transport-related challenges.

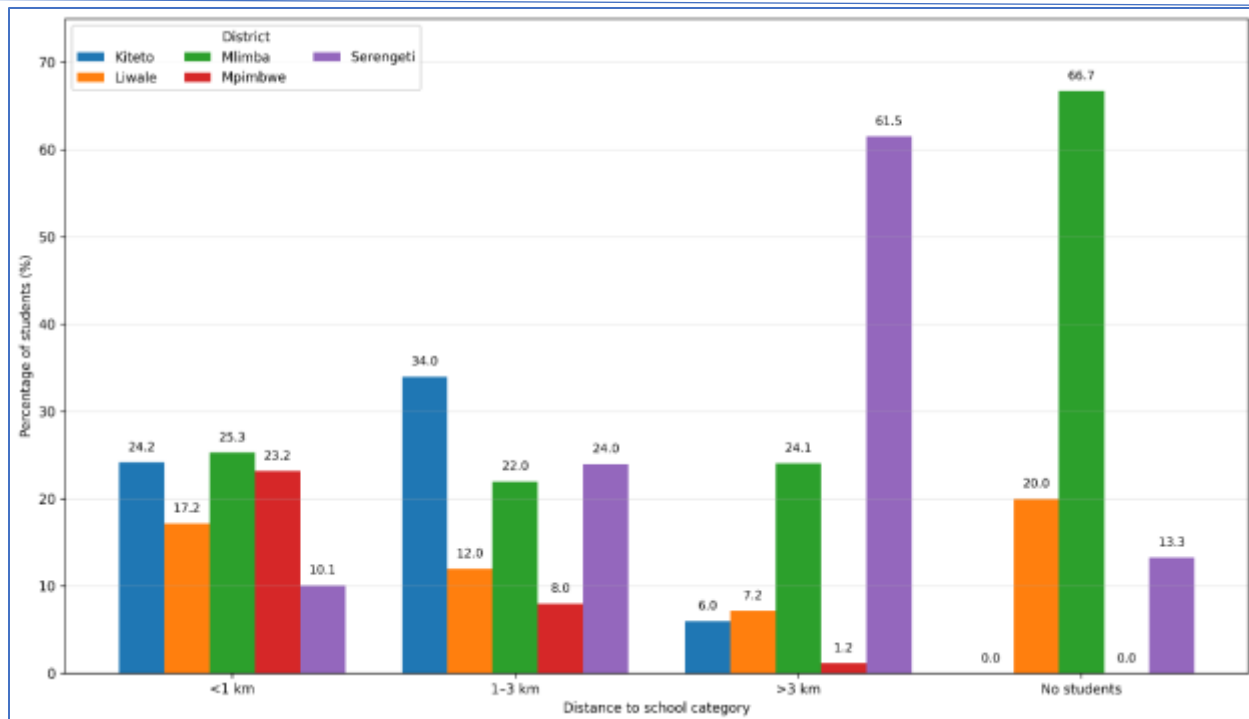


Figure 30: Distance Traveled by Students to Attend School (One Way)

The findings in figure 30 show that school travel distances vary widely across districts. Short distances are common in Kiteto (24.2%), Mlimba (25.3%), and Mpimbwe (23.2%), where many students travel less than 1 km. However, long distances are significant in Serengeti (61.5%), indicating that many students travel over 3 km daily. Mlimba (24.1%) also shows a notable share of long-distance travel. Moderate distances (1–3 km) are common in Kiteto (34.0%) and Serengeti (24.0%), suggesting regular walking for many students. A portion of households reported no students in school, especially in Mlimba (66.7%), which may reflect demographic or access factors. Overall, the results indicate that while some students live close to school, many travel long distances, particularly in Serengeti, which may affect attendance and increase exposure to transport challenges.

Long Distances as a Normalized Burden

Across regions, students particularly those in remote settlements were reported to travel long distances to reach schools. Although some wards have benefited from the establishment of satellite or boarding schools, distance remains a structural barrier in many rural areas.

An elderly participant from Morogoro Region described the scale of the challenge:

“The secondary school is far, nearly 20 kilometers from some areas.” — FGD Participant, Morogoro Region

Similarly, a participant from Manyara Region highlighted the daily strain on children:



“A child may start their journey at 5 a.m. and reach school by 8 a.m., passing through dense forest.”
— FGD Participant, Manyara Region

Long travel distances have become normalized within rural schooling routines. Even where educational facilities are present, dispersed settlement patterns expose students to physical fatigue and safety risks before the school day begins, affecting attendance, concentration, and overall learning outcomes.

6.3.2.2 Time taken by children to reach school

This subsection examines the time children typically spend traveling to school, based on survey responses. Travel time affects attendance, punctuality, fatigue, and learning outcomes.

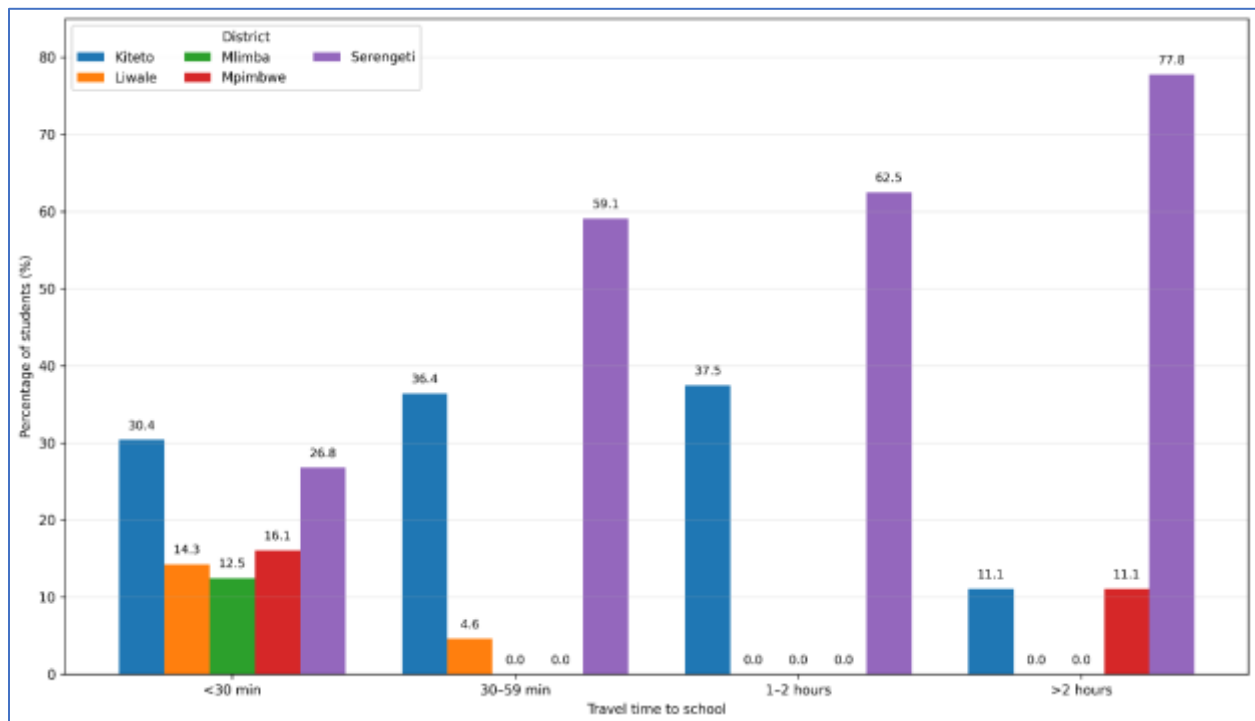


Figure 31: Time Taken by Children to Reach School (One Way)

The findings in figure 31 show that travel time to school varies widely across districts. Short travel times are more common in Kiteto (30.4%), while Liwale and Mlimba also show relatively low travel durations. However, Serengeti stands out with very long travel times, with 62.5% of children traveling 1–2 hours and 77.8% over two hours, indicating serious distance and access challenges. Moderate travel times (30–59 minutes) are also common in Serengeti (59.1%) and Kiteto (36.4%), suggesting extended daily travel for many students. In Mpimbwe, some children also experience longer travel times, including 11.1% traveling more than two hours. Overall, the results indicate that while some children reach school quickly, a significant number especially in Serengeti spend long hours traveling, which may affect attendance, increase fatigue, and reduce learning performance.

Travel Time as a Source of Fatigue and Learning Loss



Travel time to school was consistently described as excessive, often ranging from one to three hours per trip. Participants emphasized that students frequently arrive tired, late, and unable to concentrate fully during lessons.

A community representative from Lindi Region explained the cumulative impact:

“Children walk long distances and arrive exhausted before lessons even start.” — Community Representative, Lindi Region

Extended travel time directly undermines learning readiness. Time spent in transit reduces classroom engagement, affects concentration levels, and contributes to weaker academic performance, particularly for students from remote settlements.

6.3.2.3 Changes in school travel time during the rainy season

This subsection examines whether the time taken by children to reach school changes during the rainy season, based on the Household Survey. Seasonal effects on travel time reflect road condition, drainage, and transport availability.

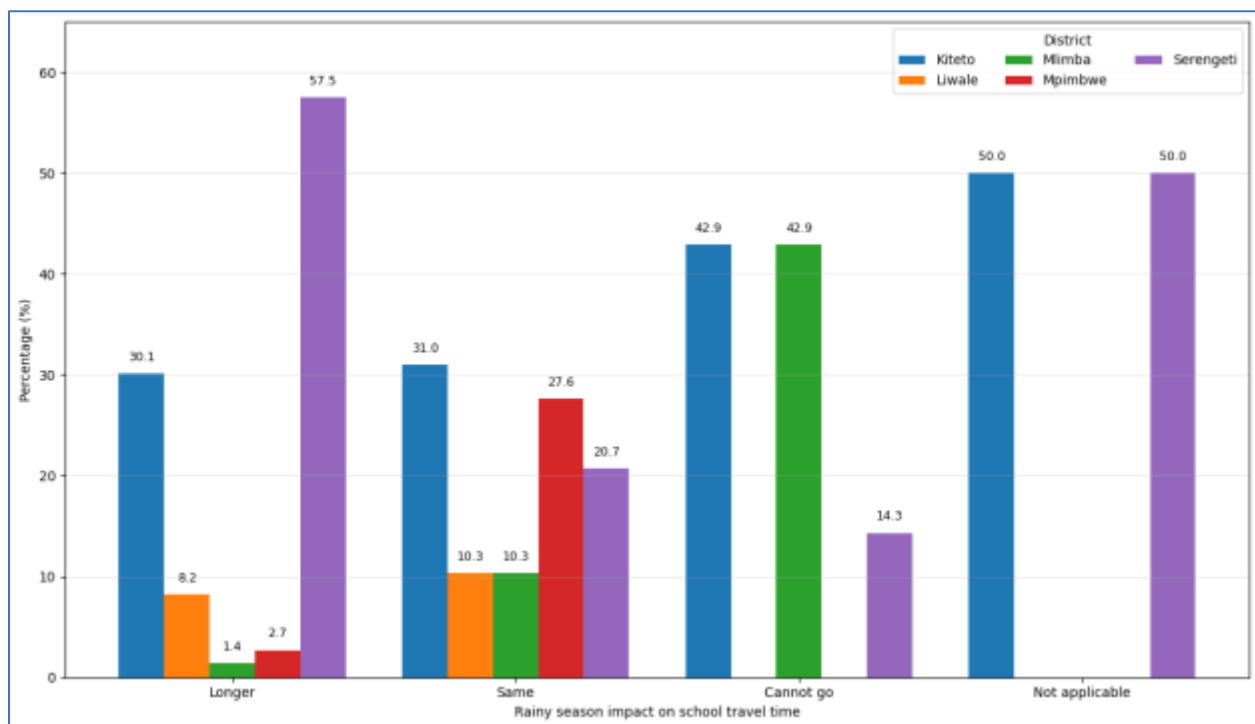


Figure 32: Changes in School Travel Time During the Rainy Season

Figure 32 show that the impact of the rainy season on school travel time varies significantly across districts. In Serengeti, the majority of respondents (57.5%) reported that travel time becomes longer during the rainy season, indicating substantial seasonal challenges affecting school access. In Kiteto, responses are more mixed, with similar proportions reporting longer travel times (30.1%) and no change (31.0%), while a notable



share (42.9%) reported that children cannot attend school during heavy rains, suggesting serious seasonal barriers in some areas. In Mlimba, although fewer respondents reported increased travel time (1.4%), a large proportion (42.9%) indicated that children cannot go to school during heavy rains, pointing to severe accessibility constraints despite fewer reported travel delays. In Mpimbwe, most respondents reported no change in travel time (27.6%), and no cases of complete inaccessibility were recorded, suggesting relatively better road conditions or transport reliability during the rainy season. In Liwale, the responses are relatively low across categories, with modest reporting of increased travel time (8.2%) and no cases of complete inaccessibility, indicating comparatively fewer reported seasonal disruptions. Overall, the findings indicate that rainy season conditions significantly disrupt school access in several districts, particularly in Serengeti, Kiteto, and Mlimba. In some areas, children experience longer travel times, while in others, access is completely cut off during heavy rains. This reflects the strong influence of road conditions and seasonal weather on education access, as also noted in broader studies showing that flooding and poor road infrastructure can make schools difficult or impossible to reach during rainy periods.

Rain as a Multiplier of Distance and Risk

During the rainy season, school travel times increase substantially due to flooded paths, damaged bridges, and muddy roads. In some areas, routes become entirely impassable until water levels decline.

A participant from Katavi Region described the seasonal disruption:

“When it rains, students cannot cross until the water recedes.” — FGD Participant, Katavi Region

Rainfall therefore amplifies existing distance barriers and heightens safety risks. What is already a long journey in the dry season can become uncertain or impossible during heavy rains. Seasonal inaccessibility results in intermittent but severe disruption to schooling and educational continuity.

6.3.2.4 School absenteeism due to transport challenges

This subsection examines whether children have missed school due to transport-related problems in the past three months, based on survey responses. This reflects how transport conditions affect education continuity.

Table 38: School Absenteeism Due to Transport Challenges (Past 3 Months)

District	Many times (%)	A few times (%)	No (%)	Not applicable (%)	Total (%)
Kiteto	33.3	27.3	32.1	33.3	31.5
Liwale	14.8	4.6	7.1	0	8.1
Mlimba	0	13.6	7.1	0	6.3
Mpimbwe	7.4	13.6	8.9	0	9
Serengeti	44.4	40.9	44.6	66.7	45.1



Total	100	100	100	100	100
-------	-----	-----	-----	-----	-----

The findings in table 38 show that school absenteeism due to transport challenges is notable in several districts. Serengeti records the highest levels, with 44.4% reporting many missed days and 40.9% a few missed days, indicating frequent disruption to school attendance. Kiteto also shows relatively high absenteeism, with a combined share of children missing school either many or a few times. In Liwale, Mlimba, and Mpimbwe, absenteeism is present but at lower levels, suggesting less frequent but still important disruptions. A portion of households reported no missed school days, though this varies across districts, and some responses were marked as not applicable. Overall, the results indicate that transport challenges continue to affect school attendance, particularly in Serengeti and Kiteto, highlighting the impact of poor road conditions and limited transport access on education.

Transport as a Driver of Absenteeism

Participants consistently linked poor transport conditions to frequent school absenteeism, particularly during the rainy season. Children were reported to miss classes not because of disinterest, but because routes become unsafe or impassable.

A community representative from Mara Region explained:

“Students may stay home for up to three days when bridges collapse.” — Community Representative, Mara Region

Absenteeism in this context is structurally induced rather than behavior-driven. Transport barriers transform seasonal environmental challenges into lost instructional time, contributing to widening educational inequality in rural areas.

6.3.2.5 School changes or dropout linked to transport challenges

This subsection examines whether transport-related difficulties have led children to change schools, drop out, or relocate, based on survey responses. These outcomes reflect longer-term impacts of transport barriers on education.

Table 39: School Change, Dropout, or Relocation Due to Transport Challenges

District	Yes (%)	No (%)	Not sure (%)	Total (%)
Kiteto	11.4	40	100	31.5
Liwale	11.4	6.7	0	8.1
Mlimba	2.9	8	0	6.3
Mpimbwe	8.6	9.3	0	9



Serengeti	65.7	36	0	45.1
Total	100	100	100	100

The findings in table 39 show that transport challenges have contributed to school changes and dropouts in several districts. The impact is most pronounced in Serengeti (65.7%), where a large share of households reported such disruptions, indicating serious transport-related barriers to education continuity. In Kiteto and Liwale (11.4% each), some households also report these effects, though at lower levels. Mlimba (2.9%) and Mpimbwe (8.6%) show relatively smaller shares, suggesting more limited but still present impacts.

A considerable share of households reports no such disruptions, though this varies across districts. Some responses, particularly in Kiteto, indicate uncertainty. Overall, the results suggest that while not universal, transport challenges are a key factor behind school changes and dropouts, especially in areas like Serengeti where access constraints are more severe.

Transport Constraints Driving Educational Attrition

In more severe cases, transport challenges were reported to influence school transfer decisions and, in some instances, permanent dropout particularly among secondary students and girls.

A community representative from Mara Region reflected on the longer-term consequences:

“Some even drop out because of the difficulty in reaching school.” — Community Representative, Mara Region

Persistent transport barriers lead some households to reassess the feasibility of continued schooling. Over time, this contributes to interrupted education pathways, early dropout, and reduced human capital development within affected communities.

6.3.3 Health & Emergency Access

This subsection examines how transport conditions affect access to health services and emergency care within the community. Reliable transport is critical for timely access to health facilities, especially during emergencies, childbirth, and acute illness. Evidence from the Household Survey and earlier access indicators shows that poor road conditions, long travel times, seasonal inaccessibility, and limited transport availability delay or prevent access to health care. During the rainy season, some areas become cut off, transport fares increase, and vehicles are unwilling to operate, further constraining access. These challenges disproportionately affect vulnerable groups such as pregnant women, the elderly, and persons with disabilities. Overall, data indicate that weak transport infrastructure significantly undermines timely health and emergency access, increasing health risks and reducing the effectiveness of service delivery.

6.3.3.1 Prevention of healthcare access due to lack of transport

This subsection examines whether lack of transport has prevented households from accessing healthcare services, based on survey responses. Reliable transport is critical for timely access to health facilities.



Table 40: Healthcare Access Prevented by Lack of Transport

District	Yes (%)	No (%)	Total (%)
Kiteto	11.1	21.8	16.6
Liwale	8.9	18.3	13.7
Mlimba	36.3	26.1	31.1
Mpimbwe	5.2	14.8	10.1
Serengeti	38.5	19	28.5
Total	100	100	100

The findings table 40 show that lack of transport prevents access to healthcare in several districts, though the level varies. The problem is most pronounced in Serengeti (38.5%) and Mlimba (36.3%), where a large share of households reported being unable to reach health services. In Kiteto (11.1%) and Liwale (8.9%), the issue is present but less widespread, while Mpimbwe (5.2%) reports the lowest share. At the same time, many households report no transport-related barriers, though this does not eliminate the significance of the problem in affected areas. Overall, the results indicate that transport constraints remain a serious barrier to healthcare access, especially in Serengeti and Mlimba, where delays or inability to reach facilities may increase health risks.

Distance and Road Conditions as Barriers to Care

Across all regions, unreliable transport was consistently identified as a major barrier to accessing healthcare services, particularly during emergencies. Poor road conditions, long travel distances, and transport unavailability were reported to delay or prevent timely medical care.

A woman participant from Lindi Region explained:

“Most of the time, we have to walk. If you use transport, it is faster, but on foot it can take several hours to reach the health center.” — FGD Participant, Lindi Region

An elderly participant from Morogoro Region described the situation during the rainy season:

“When it rains, vehicles can get stuck for up to three days on the way to the hospital.” — FGD Participant, Morogoro Region

These accounts indicate that healthcare access in rural areas is shaped not only by the presence of facilities but by transport reliability. Long distances combined with fragile road infrastructure can transform manageable health conditions into life-threatening emergencies.



6.3.3.2 Effect of transport issues on access to emergency services

This subsection examines whether transport problems affect households' ability to access emergency services such as ambulances or police, based on survey responses. Timely access depends on road condition and transport availability.

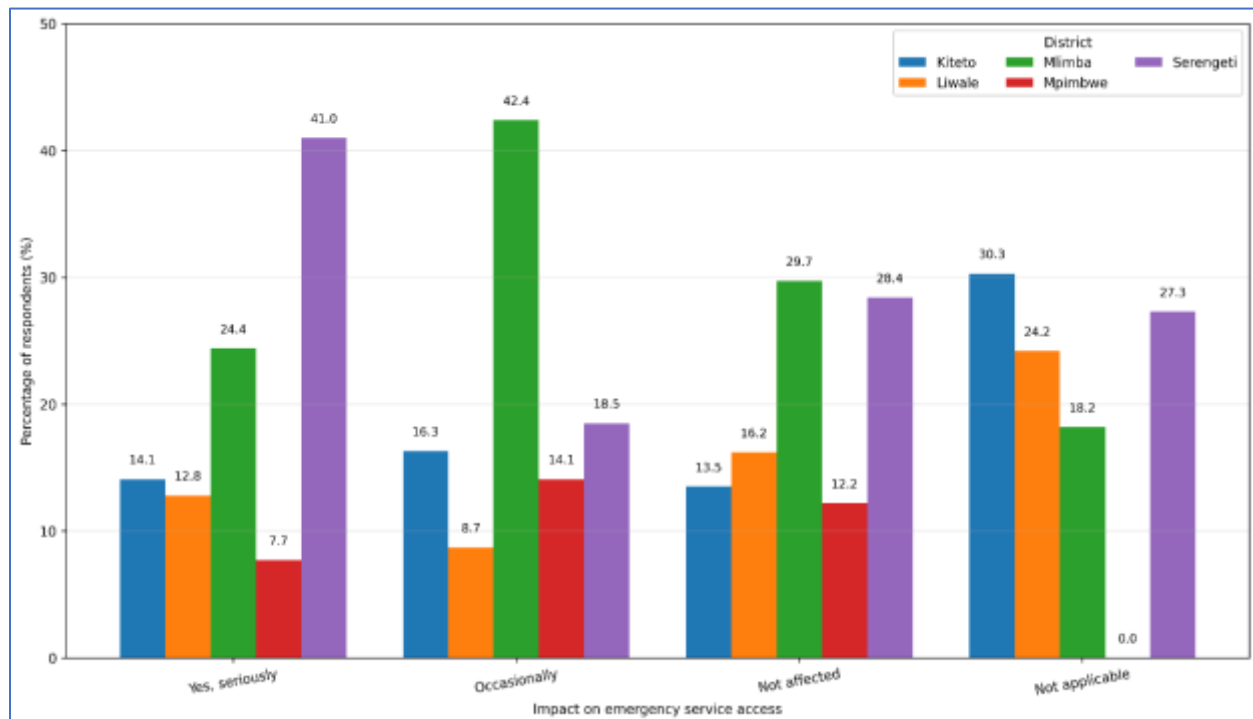


Figure 33: Effect of Transport Issues on Access to Emergency Services

The findings in figure 33 show that transport issues affect emergency access in many areas, though severity differs by district. The strongest impact is seen in Serengeti (41.0% serious) and Mlimba (24.4%), indicating major barriers to timely emergency services. Occasional effects are also high in Mlimba (42.4%), suggesting frequent but varying disruption. In Kiteto and Liwale, impacts are present but more moderate, while Mpimbwe shows relatively lower levels of serious impact. Some households report no effect, but a notable share also indicate not applicable, suggesting limited access or use of emergency services in certain areas. Overall, the results indicate that transport challenges significantly limit access to emergency services, especially in Serengeti and Mlimba, increasing risks during urgent situations.

Emergency Transport as the Weakest Link

Emergency response systems were widely described as inadequate or absent. Ambulances were reported to be scarce, and even where available, poor road conditions limited their ability to reach remote settlements. In many cases, residents relied on private vehicles or motorcycles, often at very high cost.

A participant from Manyara Region explained:



“In emergencies you must hire a private car at 100,000 to 200,000 shillings to reach the hospital.” — FGD Participant (Person with Disability), Manyara Region

Participants from Katavi Region reflected on the situation before an ambulance service was introduced:

“Before we got the ambulance, people had to hire private transport and sometimes patients died on the way.” — FGD Participant, Katavi Region

Emergency transport arrangements remain fragile and largely informal. Survival during medical crises often depends on personal financial capacity, social networks, and road passability rather than reliable institutional systems.

6.3.3.3 Delays in accessing urgent health care due to lack of transport

This subsection examines whether lack of transport has caused delays in accessing urgent health care, based on survey responses. Timely access is highly dependent on transport availability and road conditions.

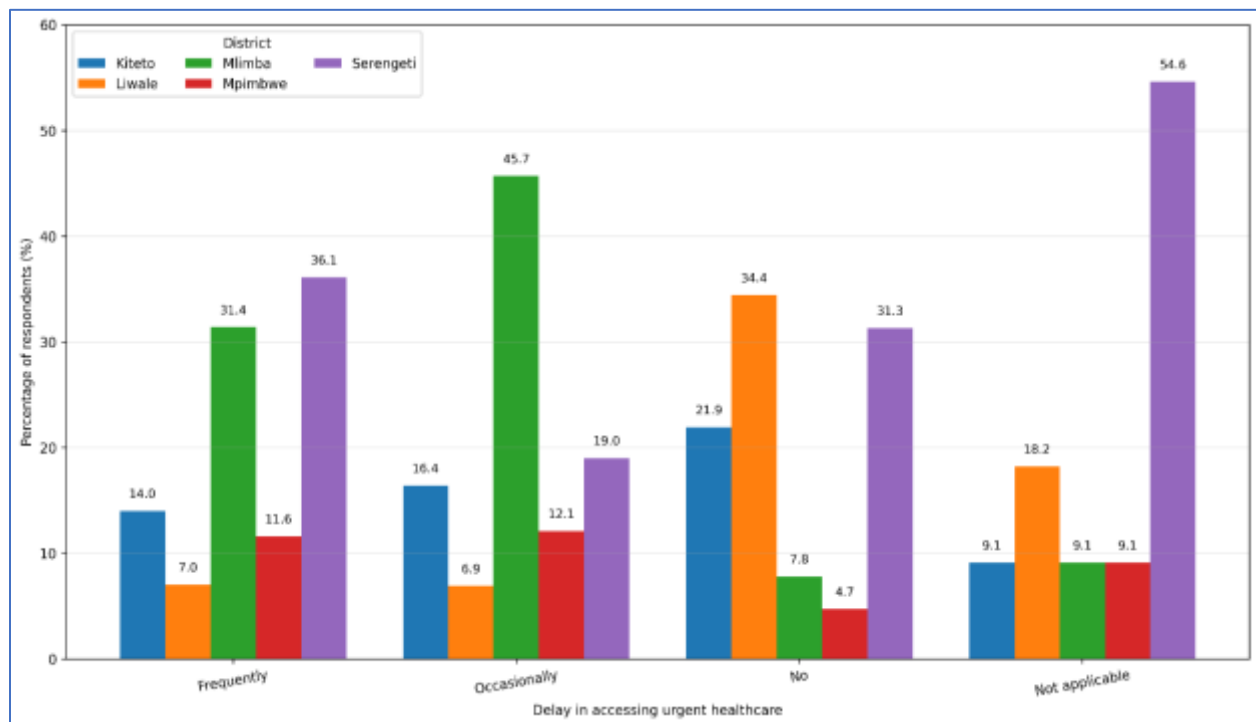


Figure 34: Delays in Accessing Urgent Health Care Due to Lack of Transport

The findings in figure 34 show that delays in accessing urgent health care are common in several districts. The problem is most severe in Mlimba (31.4% frequent, 45.7% occasional) and Serengeti (36.1% frequent), indicating major transport barriers to timely care. In Kiteto and Mpimbwe, delays are present but at moderate levels, while Liwale shows lower levels of frequent delays but a higher share reporting no delays. A notable share of responses, especially in Serengeti, fall under not applicable, suggesting uneven access or use of



urgent health services. Overall, the results indicate that transport challenges frequently delay access to urgent health care, particularly in Mlimba and Serengeti, posing serious risks to health outcomes.

Delays Turning Emergencies Fatal

Transport-related delays were repeatedly associated with severe health consequences, including deaths during transit or before reaching medical facilities. These delays were reported to worsen during the rainy season, when roads become flooded or impassable.

A community representative from Morogoro Region explained:

“Pregnant women give birth on the way or patients die before reaching care.” — Community Representative, Morogoro Region

The time-sensitive nature of medical care is fundamentally undermined by transport barriers. Delays caused by distance, poor road conditions, and vehicle unavailability can transform treatable conditions into fatal outcomes, particularly in maternal and emergency cases.

6.3.3.4 Missed healthcare among vulnerable household members due to transport constraints

This subsection examines whether household members with disabilities, pregnancy, or chronic conditions have missed healthcare due to transport challenges, based on survey responses. These groups are particularly sensitive to delays in access.

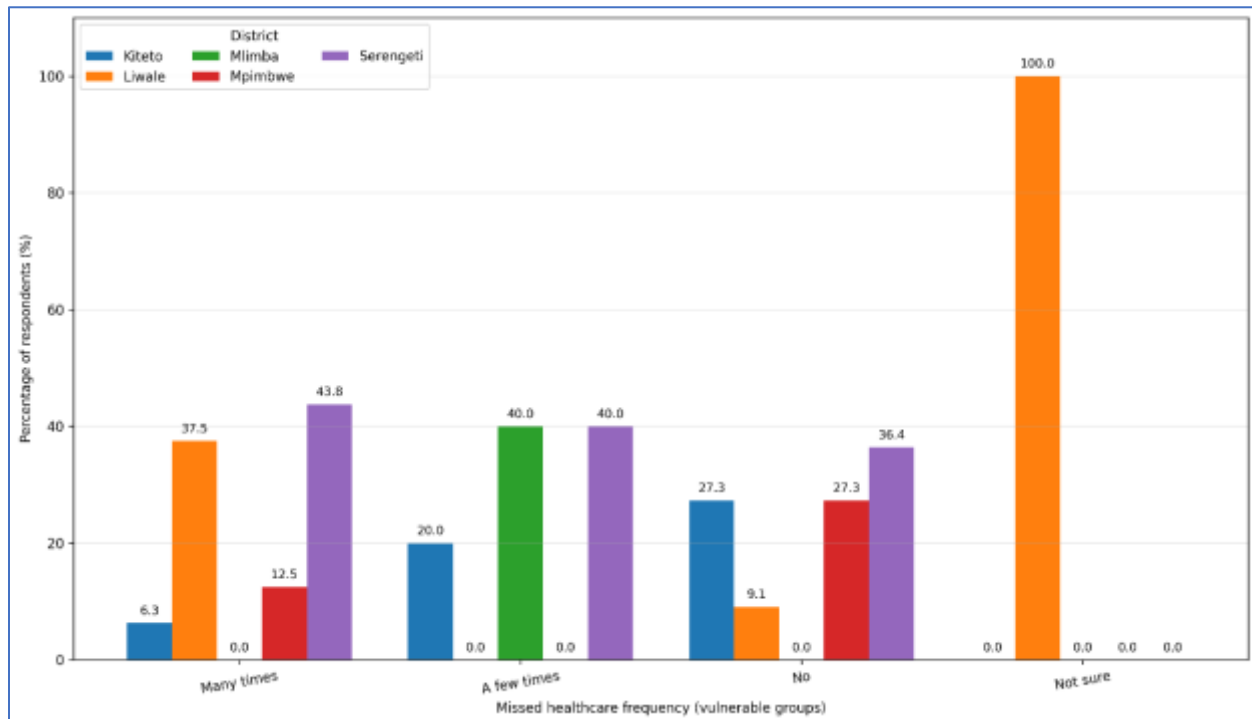


Figure 35: Missed Healthcare Among Vulnerable Household Members Due to Transport Constraints



The findings in figure 35 show that transport constraints affect access to healthcare for vulnerable groups in several districts. The impact is most severe in Serengeti (43.8% many times, 40.0% a few times) and Liwale (37.5% many times), indicating frequent missed care. In Mlimba, missed healthcare is reported mainly as a few times (40.0%), while Kiteto and Mpimbwe show lower but still notable levels. Some households report no missed care, though this varies across districts, and a portion of responses indicate uncertainty. Overall, the results suggest that transport challenges disproportionately affect vulnerable populations, particularly in Serengeti and Liwale, increasing the risk of missed or delayed healthcare.

Vulnerable Groups Bearing the Highest Cost

Elderly persons, pregnant women, children, and persons with disabilities were consistently identified as the groups most affected by transport-related healthcare barriers. When fares increase or routes become unsafe, these individuals are often the first to be excluded from seeking care.

A participant with a disability from Lindi Region explained:

“For people like us, boarding vehicles is difficult, and we end up missing appointments.” — FGD Participant (Person with Disability), Lindi Region

In Mara Region, another participant described how households cope when transport is unaffordable:

“Some parents give only painkillers at home because they cannot afford transport to the hospital.” — FGD Participant, Mara Region

Transport constraints therefore contribute to systematic exclusion from timely healthcare. These barriers deepen health inequities and reinforce cycles of preventable illness and avoidable complications among vulnerable populations.

6.3.4 Social Life, Inclusion & Community Participation

This subsection examines how transport conditions influence social interaction, inclusion, and participation in community life. Reliable and affordable transport enables people to attend social events, community meetings, religious activities, and family gatherings, strengthening social cohesion. Evidence from the Household Survey and earlier access indicators shows that poor road conditions, seasonal inaccessibility, and limited transport availability restrict movement, particularly for vulnerable groups such as the elderly, women, and persons with disabilities. When transport is unavailable or unaffordable, households reduce travel, delay visits, or withdraw from community activities altogether. Overall, the data indicate that weak transport infrastructure not only limits economic and service access but also reduces social participation and inclusion, contributing to isolation and weakened community engagement.

6.3.4.1 Effect of lack of transport on women’s participation in social and economic activities

This subsection examines how transport constraints affect women’s participation in social and economic activities, based on survey responses. Transport access influences mobility, safety, and engagement in daily activities.



Table 41: Effect of Lack of Transport on Women's Participation in Social and Economic Activities

District	Severely limits (%)	Somewhat limits (%)	No impact (%)	Not sure (%)	Total (%)
Kiteto	7.5	17.4	21.4	21.4	16.6
Liwale	6	5.1	21.4	39.3	13.7
Mlimba	34.3	39.8	25	10.7	31.1
Mpimbwe	10.5	16.3	3.6	7.1	10.1
Serengeti	41.8	21.4	28.6	21.4	28.5
Total	100	100	100	100	100

The findings in table 41 show that lack of transport limits women's participation in many areas, though the level varies by district. The strongest effects are seen in Serengeti (41.8% severely) and Mlimba (34.3%), where many households report major restrictions. In Mlimba, a large share also reports somewhat limited participation (39.8%), indicating widespread constraints. Kiteto and Mpimbwe show moderate impacts, with both severe and moderate limitations reported, while Liwale has a higher share of responses indicating no impact or uncertainty, suggesting mixed experiences. Overall, the results indicate that transport challenges reduce women's participation, especially in Serengeti and Mlimba, limiting their involvement in social and economic activities.

Mobility Constraints Limiting Women's Agency

Women across all study areas reported that poor transport significantly restricts their participation in social, economic, and communal life. Limited mobility reduces their ability to attend markets, engage in income-generating activities, or participate in community meetings, particularly during the rainy season.

A woman participant from Katavi Region explained:

"As women, during the rainy season we are stuck. Even going to church or the market becomes impossible." — FGD Participant, Katavi Region

In Lindi Region, another participant emphasized the economic implications:

"Business delays and transport costs affect us most because we depend on small trading." — FGD Participant, Lindi Region

Transport constraints therefore disproportionately reduce women's economic engagement and social visibility. Restricted mobility reinforces existing gender inequalities, especially during periods of poor road accessibility when movement becomes more difficult and costly.



6.3.4.2 Missed community events due to transport constraints

This subsection examines whether households miss community events such as meetings, funerals, or ceremonies due to transport challenges, based on survey responses. This reflects the impact of transport on social participation.

Table 42: Missed Community Events Due to Transport Constraints

District	Yes (%)	No (%)	Total (%)
Kiteto	12.7	19.9	16.6
Liwale	10.3	16.6	13.7
Mlimba	34.9	27.8	31.1
Mpimbwe	4.8	14.6	10.1
Serengeti	37.3	21.2	28.5
Total	100	100	100

The findings table 42 show that transport constraints affect participation in community events in several districts. The highest impact is observed in Serengeti (37.3%) and Mlimba (34.9%), where many households report missing important social activities. In Kiteto (12.7%) and Liwale (10.3%), the issue is present but less widespread, while Mpimbwe (4.8%) reports the lowest share. At the same time, a considerable number of households report no missed events, indicating that not all communities are equally affected. Overall, the results suggest that transport challenges limit social participation, particularly in Serengeti and Mlimba, reducing involvement in key community and cultural activities.

Social Disconnection and Missed Milestones

Community members repeatedly emphasized their inability to attend funerals, weddings, and other communal gatherings due to impassable roads and lack of transport, particularly during the rainy season.

A participant from Manyara Region explained:

“During the rains, people cannot attend funerals or weddings because roads are blocked.” — FGD Participant, Manyara Region

Similarly, a woman participant from Morogoro Region described the emotional impact:

“You may miss saying goodbye to a loved one because the road is cut off.” — FGD Participant, Morogoro Region



Transport barriers therefore extend beyond economic and service access constraints. They weaken social cohesion by limiting participation in important cultural and communal events, contributing to emotional distress and gradual erosion of traditional support networks.

6.3.4.3 Frequency of visits to neighboring villages or communities

This subsection examines how often households visit neighboring villages or communities, based on survey responses. Visit frequency reflects mobility, social interaction, and ease of movement.

Table 43: Frequency of Visits to Neighboring Villages or Communities

District	Daily (%)	Weekly (%)	Monthly (%)	Rarely (%)	Never (%)	Total (%)
Kiteto	17.2	11	18.5	20.8	6.7	16.6
Liwale	17.2	32.9	1.9	3.8	26.7	13.7
Mlimba	10.3	27.4	50	33	6.7	31.1
Mpimbwe	10.3	13.7	3.7	9.4	20	10.1
Serengeti	44.8	15.1	25.9	33	40	28.5
Total	100	100	100	100	100	100

The findings table 43 show that visit frequency varies widely across districts. More frequent visits are seen in Serengeti (44.8% daily) and Liwale (32.9% weekly), indicating stronger movement in some areas. In Mlimba, visits are mostly monthly (50.0%), suggesting less frequent interaction, while Kiteto shows a balanced pattern across categories. Infrequent visits are also common, especially rarely in Mlimba and Serengeti (33.0%) and never in Serengeti (40.0%) and Liwale (26.7%), indicating limited mobility in some communities. Overall, the results suggest that while some households maintain regular contact with neighboring areas, a large share visits infrequently, pointing to transport constraints and reduced social interaction.

Reduced Inter-Village Interaction

Poor road conditions and high transport costs were reported to limit routine visits between neighboring villages. Many residents indicated that travel is undertaken only when absolutely necessary, particularly during the rainy season or periods of high fares.

A youth participant from Katavi Region explained:

“We only travel when it is very important; otherwise, we stay home because transport is too costly.”
— FGD Participant, Katavi Region



Restricted inter-village mobility limits the flow of information, trade, and social exchange. Over time, this reinforces spatial isolation and weakens rural integration across neighboring communities.

6.3.4.4 Effect of transport problems on participation in social services and community activities

This subsection examines whether transport problems affect household participation in social services or community activities, based on survey responses. Participation reflects social inclusion and access.

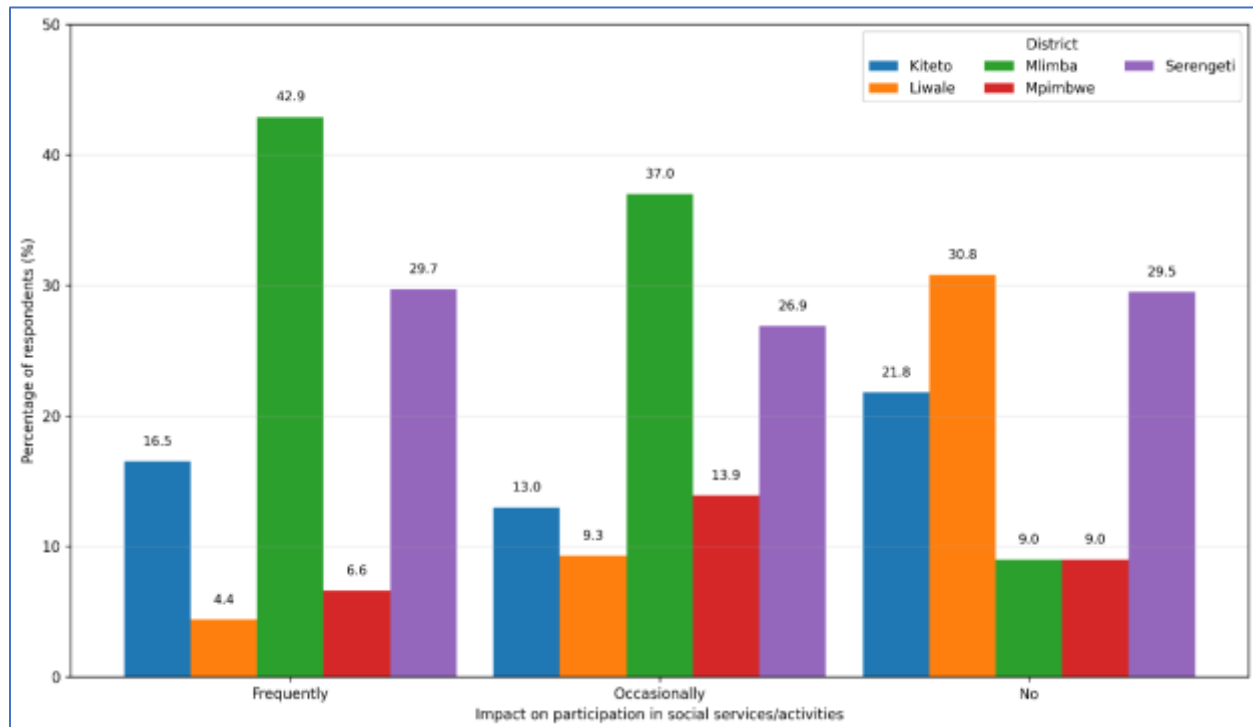


Figure 36: Effect of Transport Problems on Participation in Social Services or Community Activities

The findings figure 36 show that transport problems affect participation in many communities, especially in Mlimba, where a large share report frequent (42.9%) and occasional (37.0%) impacts. Serengeti also shows notable effects, with both frequent and occasional impacts reported at moderate levels. In Kiteto and Mpimbwe, impacts are present but less severe, while Liwale has a higher share of households reporting no effect (30.8%), suggesting relatively fewer constraints. Overall, the results indicate that transport challenges limit participation in social services and community activities, particularly in Mlimba and Serengeti, reducing community engagement and inclusion.

Civic Participation Undermined

Transport difficulties were reported to reduce attendance at public meetings, training sessions, and community development activities. This challenge was described as particularly pronounced among elderly persons and persons with disabilities.

A community representative from Katavi Region explained:



“Lack of public transport isolates elders and people with disabilities from meetings.” — Community Representative, Katavi Region

Transport barriers therefore weaken inclusive governance by limiting participation in local decision-making processes. Reduced attendance undermines accountability, representation, and community ownership of development initiatives.

6.3.4.5 Influence of transport on access to family and religious activities

This subsection examines how transport affects households’ ability to participate in family and religious activities, based on survey responses. Such participation is important for social connection and community cohesion.

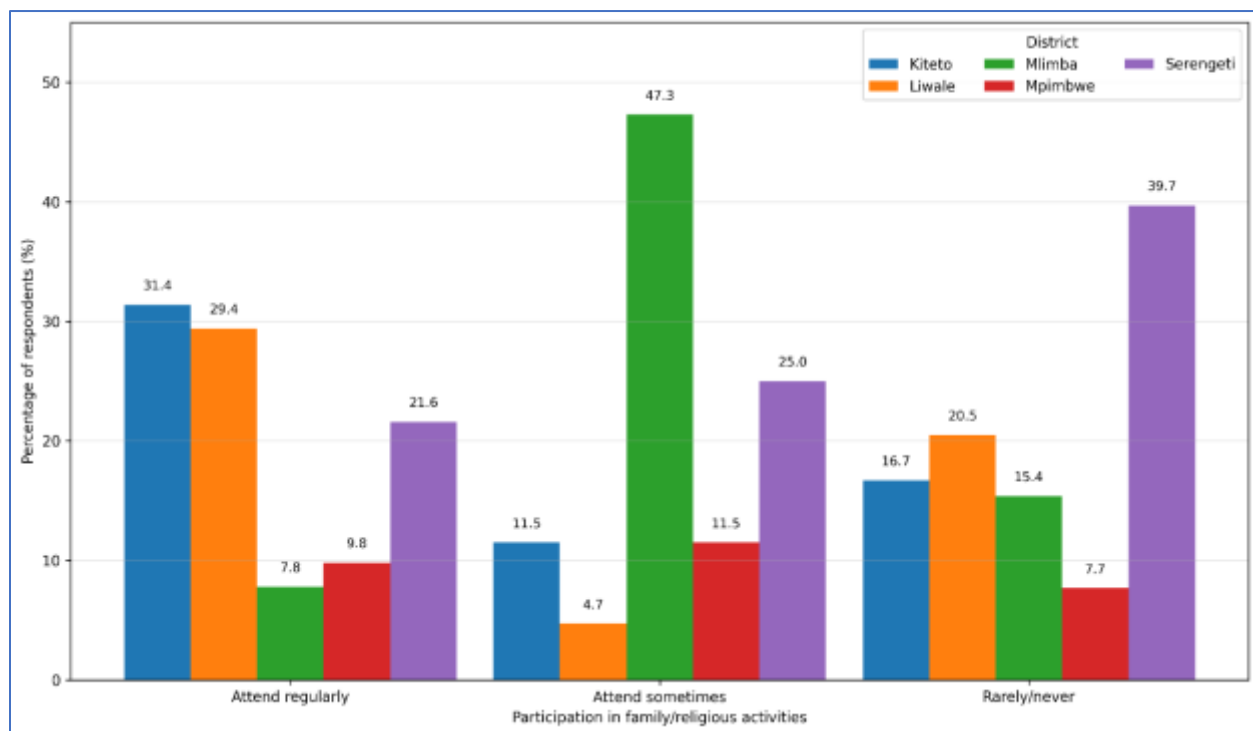


Figure 37: Influence of Transport on Access to Family and Religious Activities

The findings in figure 37 show that transport has a clear influence on participation in family and religious activities, though the level varies across districts. Regular participation is higher in Kiteto (31.4%) and Liwale (29.4%), indicating relatively better access. In Mlimba, most households attend only sometimes (47.3%), suggesting inconsistent access due to transport limitations. Serengeti shows the strongest constraints, with 39.7% rarely or never attending, indicating significant barriers. Overall, the results indicate that many households face some level of restriction, particularly in Mlimba and Serengeti, showing that transport challenges affect social and religious engagement.

Faith and Family Ties Disrupted



Religious gatherings and family visits were frequently disrupted by poor transport conditions, particularly during the rainy season when roads become unsafe or impassable.

A participant from Katavi Region explained:

“Sometimes the water is too much and we cannot even go to church.” — FGD Participant, Katavi Region

Transport constraints therefore extend beyond economic and service-related impacts. They disrupt spiritual life and family connections, affecting emotional wellbeing and weakening the social stability that depends on regular communal interaction.

6.3.5 Vulnerable Groups & Equity (Disability, Elderly, Pregnant Women)

This subsection examines how transport conditions affect vulnerable groups, specifically persons with disabilities, the elderly, and pregnant women. These groups have higher mobility needs and are more sensitive to poor road conditions, long travel distances, and unreliable transport services. Evidence from the Household Survey and Transport Service Providers shows that inadequate roads, seasonal inaccessibility, and high transport costs disproportionately limit their access to health care, social services, markets, and community activities. Missed medical appointments, delayed emergency care, and reduced participation in social life are more common among these groups. Pregnant women, in particular, face serious risks due to the lack of reliable emergency transport, while persons with disabilities and the elderly encounter physical and financial barriers that restrict movement. Overall, the data indicate that weak transport infrastructure reinforces inequality, placing a heavier burden on already vulnerable populations and highlighting the need for inclusive, accessible, and affordable transport solutions.

6.3.5.1 Ease of access to transport for vulnerable household members

This subsection examines how easy it is for vulnerable household members such as persons with disabilities, the elderly, and pregnant women to access transport when needed, based on survey responses.

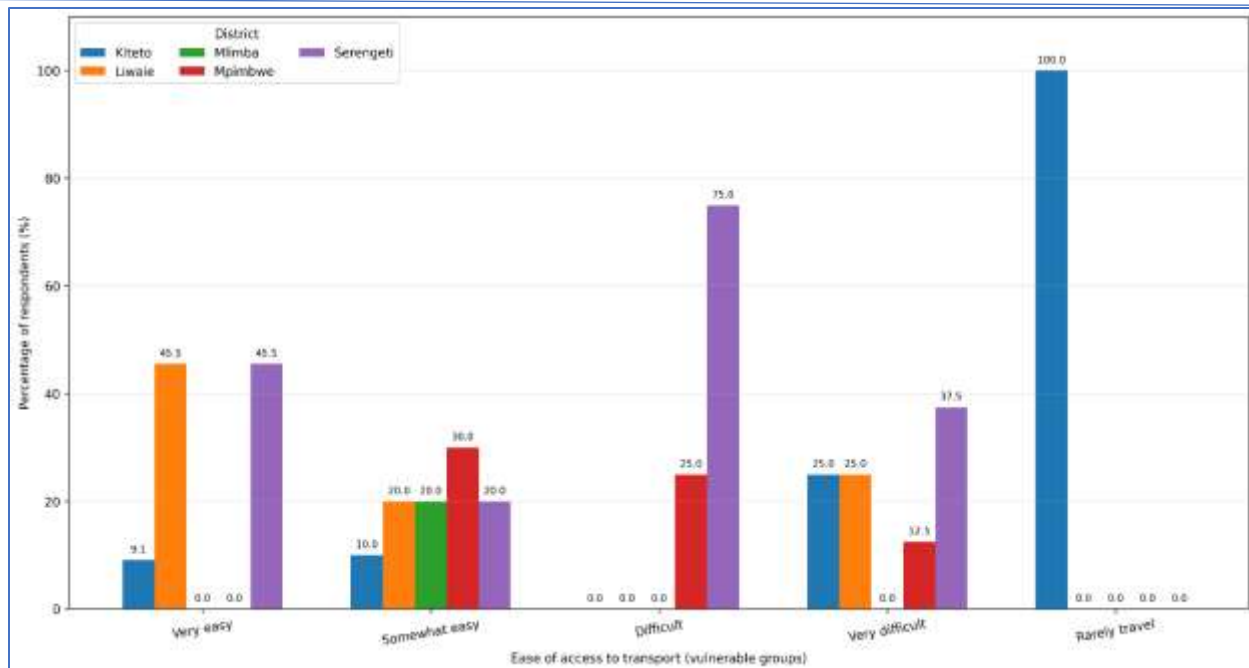


Figure 38: Ease of Access to Transport for Vulnerable Household Members

The findings in figure 38 show that access to transport for vulnerable groups is uneven across districts. Easier access is reported in Liwale and Serengeti (45.5% very easy), suggesting relatively better availability in some areas. However, significant difficulties are also evident, especially in Serengeti, where 75.0% report difficulty and 37.5% very difficult access, indicating serious barriers. In Mpimbwe, a notable share also reports difficult (25.0%) and very difficult (12.5%) access, while Kiteto shows a high proportion indicating very difficult access or limited travel. Mlimba reflects more moderate conditions, with some reporting access as somewhat easy. Overall, the results indicate that while some vulnerable individuals can access transport, many still face major challenges, particularly in Serengeti and Mpimbwe, limiting their ability to reach essential services and participate in daily activities.

Structural Exclusion of Vulnerable Groups

Across all regions, vulnerable groups particularly persons with disabilities, elderly individuals, and pregnant women were reported to face significant barriers in accessing transport services. Poor road conditions, unsuitable vehicles, and long travel distances make both routine and emergency journeys extremely difficult.

A participant with a disability from Manyara Region described the daily challenge:

“Motorcycles are very difficult for me because of my hips. I must sit sideways, which is painful and unsafe.” — FGD Participant (Person with Disability), Manyara Region

In Lindi Region, another participant highlighted the burden on elderly residents:



“A sick or elderly person cannot walk long distances, so they stay home.” — FGD Participant, Lindi Region

Rural transport systems are largely not designed with vulnerable users in mind. Physical barriers, unsafe travel modes, and extended distances collectively restrict mobility, reinforcing exclusion from essential services and social participation.

6.3.5.2 Availability of transport services adapted for vulnerable groups

This subsection examines whether transport services are adapted to meet the needs of vulnerable groups, based on survey responses. Such services are important for safe and inclusive mobility.

Table 44: Availability of Transport Services Adapted for Vulnerable Groups

District	Yes (%)	Informal arrangements (%)	None (%)	Not sure (%)	Total (%)
Kiteto	9.1	0	22.2	0	14.7
Liwale	36.4	100	11.1	50	26.5
Mlimba	9.1	0	5.6	0	5.9
Mpimbwe	18.2	0	5.6	50	14.7
Serengeti	27.3	0	55.6	0	38.2
Total	100	100	100	100	100

The findings in table 44 show that adapted transport services are limited and unevenly distributed. Some availability is reported in Liwale (36.4%) and Serengeti (27.3%), indicating partial access in these areas. However, a large share of households reports no adapted services, especially in Serengeti (55.6%) and Kiteto (22.2%), highlighting major gaps. Informal arrangements are mentioned mainly in Liwale, suggesting reliance on ad hoc solutions rather than structured services. A portion of respondents are uncertain, particularly in Liwale and Mpimbwe, indicating low awareness or unclear availability. Overall, the results indicate that transport systems are not well adapted to vulnerable groups, leaving many dependents on informal or unsuitable options.

Absence of Inclusive Transport Options

Most communities reported a lack of transport services adapted to the needs of vulnerable populations. Ambulances, patient-dedicated vehicles, and disability-friendly transport options were described as scarce or unreliable.

A participant from Katavi Region explained:



“Motorcycles are not safe for patients or pregnant women; we need vehicles.” — FGD Participant, Katavi Region

In Lindi Region, another participant highlighted the institutional gap:

“There is no government emergency transport here; we rely on private vehicles.” — FGD Participant, Lindi Region

The absence of inclusive and adapted transport services increases risk for vulnerable groups, especially during medical emergencies. Dependence on unsafe or costly private options further deepens inequality and limits equitable access to care.

6.3.5.3 Priority or assistance received by vulnerable members when using transport services

This subsection examines whether vulnerable household members receive priority or assistance when using transport services, based on survey responses. Such support is important for safe and equitable access.

Table 45: Priority or Assistance Received by Vulnerable Members When Using Transport Services

District	Always (%)	Sometimes (%)	Rarely (%)	Never (%)	Not applicable (%)	Total (%)
Kiteto	7.7	0	0	30.8	0	14.7
Liwale	38.5	33.3	0	23.1	0	26.5
Mlimba	0	0	33.3	0	50	5.9
Mpimbwe	15.4	0	66.7	7.7	0	14.7
Serengeti	38.5	66.7	0	38.5	50	38.2
Total	100	100	100	100	100	100

The findings in table 45 show that support for vulnerable groups is inconsistent across districts. Regular assistance is more common in Liwale and Serengeti (38.5% always), indicating some level of support. However, many households report rare or no assistance, especially in Mpimbwe (66.7% rarely) and Kiteto (30.8% never). In Serengeti, responses are mixed, with both high support and high lack of support reported, showing uneven experiences. A notable share, particularly in Mlimba and Serengeti, report not applicable, suggesting limited use of such transport services. Overall, the results indicate that priority and assistance for vulnerable users are not consistently provided, leading to unequal access and varied experiences across areas.

Limited Consideration in Transport Provision



Participants reported that vulnerable individuals rarely receive priority or special assistance when using available transport services. Operators were described as prioritizing route viability and profitability, particularly during the rainy season when road conditions worsen.

A participant from Morogoro Region explained:

“Drivers refuse to carry pregnant women because roads are bad and they fear breakdowns.” — FGD Participant, Morogoro Region

Market-driven transport provision, in the absence of supportive regulation or targeted safeguards, can result in the exclusion of vulnerable users. During periods of poor road accessibility, commercial risk considerations often outweigh social protection needs.

6.3.5.4 Perceived safety of transport options for vulnerable members

This subsection examines how safe vulnerable household members feel when using available transport options, based on survey responses. Perceived safety affects willingness to travel and access services.

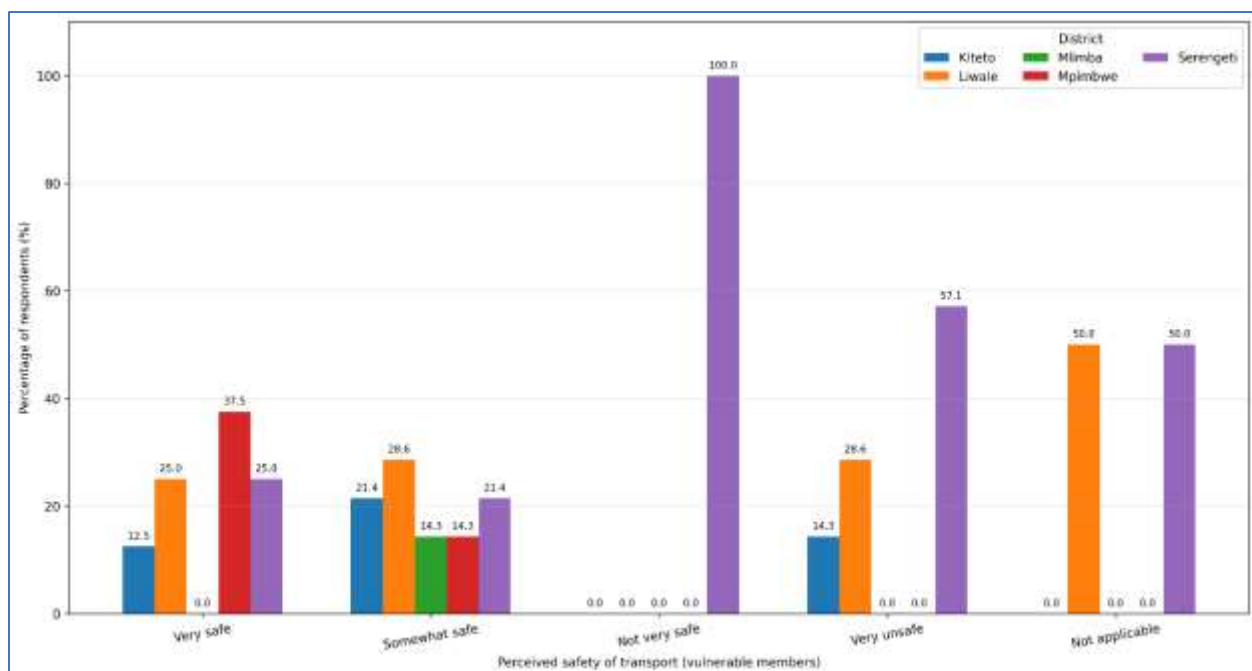


Figure 39: Perceived Safety of Transport Options for Vulnerable Members

The findings in figure 39 show that perceptions of safety are mixed across districts. Higher levels of safety are reported in Mpimbwe (37.5% very safe) and Liwale, where many feel somewhat or very safe. However, concerns are evident in several areas. Serengeti stands out, with a large share reporting not very safe (100.0%) and very unsafe (57.1%), indicating serious safety concerns. In Kiteto and Liwale, some respondents also report feeling very unsafe, though at lower levels. A notable share of responses, especially in Liwale and Serengeti, are not applicable, suggesting limited use of transport by vulnerable individuals.



Overall, the results indicate that while some vulnerable groups feel safe, a significant proportion perceive transport as unsafe, particularly in Serengeti, which may limit mobility and access to essential services.

High Perceived and Actual Risk

Transport options were widely perceived as unsafe for vulnerable groups. Overcrowded motorcycles, poor road surfaces, and the absence of safety infrastructure were frequently associated with accidents and fear of travel.

A participant from Katavi Region explained:

“Pregnant women give birth on the way because motorcycles cannot move fast.” — FGD Participant, Katavi Region

Similarly, participants from Morogoro Region described the dangers posed by road conditions:

“Deep holes and muddy roads are dangerous for patients.” — FGD Participant, Morogoro Region

Unsafe transport conditions therefore present direct health and safety risks, particularly for pregnant women, elderly persons, and individuals requiring urgent medical attention. These risks contribute to preventable injuries, maternal complications, and, in some cases, fatalities.

6.3.5.5 Healthcare Access and Transport Constraints

This subsection examines how the availability and accessibility of land transport services influence households’ ability to access healthcare. The analysis uses household survey responses to determine whether transport barriers prevented respondents or their family members from accessing healthcare services within the last 12 months. Transport-related factors such as road type, road condition, year-round accessibility, availability of public transport, and travel time to health facilities were included as explanatory variables to assess their influence on healthcare access.

Table 46: Ordered Logistic Regression Results – Effect of Transport Conditions on Healthcare Access

Variables	Coefficient	Std. Error	t-value	p-value	95% Confidence Interval	Significance
Main type of road connecting village to nearest town/service center	-0.396	0.324	-1.22	0.222	-1.031 – 0.239	



Variables	Coefficient	Std. Error	t-value	p-value	95% Confidence Interval	Significance
Overall condition of the main road near household	-0.361	0.186	-1.94	0.052	-0.725 – 0.004	*
Year-round accessibility of village roads	-0.377	0.153	-2.47	0.014	-0.676 – -0.077	**
Availability of public transport service in the village	-0.025	0.105	-0.23	0.815	-0.230 – 0.181	
Cut point (intercept)	-3.345	1	–	–	-5.304 – -1.385	

Table 46.1: Model Statistics

Indicator	Value
Mean dependent variable	1.513
Standard deviation	0.501
Pseudo R ²	0.067
Number of observations	277
Chi-square	25.673
Prob > chi ²	0
Akaike Information Criterion (AIC)	368.153
Bayesian Information Criterion (BIC)	386.274

Significance levels: * $p < 0.01$, ** $p < 0.05$, * $p < 0.10$**

The regression results in table 46 and 46.1 indicates that several transport-related factors influence the likelihood that households fail to access healthcare due to transport constraints. Among the explanatory variables, year-round accessibility of village roads shows a statistically significant relationship with healthcare access ($p = 0.014$). The negative coefficient suggests that improved year-round road accessibility reduces the probability that households experience transport-related barriers to healthcare. This finding highlights the



importance of maintaining roads that remain usable across seasons, particularly during rainy periods when many rural roads become impassable. The overall condition of the main road near the household is also marginally significant ($p = 0.052$). This result indicates that better road conditions are associated with a lower likelihood of transport preventing access to healthcare. Poorly maintained roads increase travel difficulty, slow vehicle movement, and discourage transport providers from operating in certain areas, thereby affecting healthcare access. In contrast, the main type of road surface and the availability of public transport services do not show statistically significant relationships with healthcare access in this model. This suggests that the physical usability of roads and their seasonal reliability may play a more important role than road classification or the nominal presence of transport services. Overall, the model is statistically significant (Chi-square = 25.673, $p < 0.001$), indicating that the included transport variables collectively contribute to explaining variations in healthcare access outcomes. However, the pseudo- R^2 value of 0.067 suggests that while transport infrastructure plays an important role, other factors such as household income, distance to health facilities, and availability of emergency transport may also influence healthcare access in rural communities.

Converging Evidence of Road–Health Linkages

Although quantitative regression analysis is presented separately, qualitative narratives consistently point to a strong association between poor road characteristics such as mud, steep gradients, inadequate drainage, and damaged bridges and delays in accessing healthcare services.

A community representative from Mara Region observed:

“Pregnant women may take several hours to reach a health facility due to poor roads.” — Community Representative, Mara Region

The qualitative evidence reinforces the conclusion that road quality is a critical determinant of timely health access. Deficient infrastructure increases travel time, limits transport availability, and heightens health risks, particularly in maternal and emergency situations.

6.3.5.6 Economic Opportunities and Transport Accessibility

This subsection examines how the availability and accessibility of land transport services influence household economic opportunities. The analysis focuses on whether transport conditions affect households’ ability to generate income through improved market access, reduced travel barriers, and lower transport costs. The dependent variable captures respondents’ perceptions of how transport availability affects household income, while key transport-related factors such as road type, road condition, availability of public transport, travel time to markets, and seasonal fare changes are included as explanatory variables.

Table 47: Ordered Logistic Regression Results – Effect of Transport Conditions on Household Income Opportunities



Variables	Coefficient	Std. Error	t-value	p-value	95% Confidence Interval	Significance
Main type of road connecting village to nearest town/service center	0.273	0.292	0.93	0.351	-0.300 – 0.846	
Overall condition of the main road near household	0.08	0.165	0.49	0.628	-0.243 – 0.403	
Availability of public transport service in the village	-0.027	0.097	-0.27	0.783	-0.217 – 0.164	
Travel time to the nearest major market	-0.098	0.131	-0.75	0.453	-0.355 – 0.158	
Transport fares increase during rainy season or bad weather	-0.688	0.269	-2.56	0.01	-1.215 – -0.161	**
Cut point 1	-3.099	0.981	–	–	-5.022 – -1.176	
Cut point 2	-1.024	0.95	–	–	-2.886 – 0.837	
Cut point 3	1.864	0.96	–	–	-0.017 – 3.746	

Table 47.1 Model Statistics

Indicator	Value
Mean dependent variable	2.819
Standard deviation	0.72
Pseudo R ²	0.015
Number of observations	277
Chi-square	8.749



Prob > χ^2	0.12
Akaike Information Criterion (AIC)	595.291
Bayesian Information Criterion (BIC)	624.283

Significance levels: * $p < 0.01$, ** $p < 0.05$, * $p < 0.10$**

The ordered logistic regression results in table 47 and 47.1 examines the relationship between transport accessibility and household income outcomes. Among the explanatory variables, seasonal increases in transport fares during rainy periods show a statistically significant relationship with household income outcomes ($p = 0.010$). The negative coefficient indicates that when transport fares rise during adverse weather conditions, households are more likely to experience reduced income opportunities. This finding reflects the economic burden imposed by higher transport costs, which increase transaction costs for farmers, traders, and small-scale entrepreneurs seeking to access markets. Other transport-related variables, including road type, road condition, availability of public transport services, and travel time to the nearest major market, do not show statistically significant effects in this model. This suggests that while these factors may influence economic activity, their direct statistical relationship with household income outcomes may be weaker compared to the impact of transport costs.

Overall, the model explains a modest proportion of variation in household income outcomes, as indicated by the relatively low pseudo- R^2 value (0.015). The overall model significance is also limited (Prob > $\chi^2 = 0.120$), indicating that additional factors beyond transport infrastructure such as agricultural productivity, market prices, and household resources likely influence income outcomes in rural communities. Despite these limitations, the results highlight the importance of transport affordability, particularly during seasonal disruptions. Rising transport costs can reduce households' ability to participate in market activities and may undermine income-generating opportunities, especially for rural households that depend on regular market access.

6.3.5.7 Education Access and Transport Constraints

This subsection examines how the availability and accessibility of land transport services influence education access within rural households. The analysis focuses on whether transport-related challenges contribute to missed schooling and other essential activities. The dependent variable captures whether any household member missed school, work, or medical care due to transport problems in the previous 12 months. Transport infrastructure characteristics and travel time to school were included as explanatory variables to assess their influence on educational access.

Table 48: Ordered Logistic Regression Results – Effect of Transport Conditions on Education Access



Variables	Coefficient	Std. Error	t-value	p-value	95% Confidence Interval	Significance
Main type of road connecting village to nearest town/service center	-0.345	0.474	-0.73	0.467	-1.275 – 0.585	
Overall condition of the main road near household	-0.023	0.248	-0.09	0.927	-0.509 – 0.463	
Year-round accessibility of village roads	0.143	0.295	0.48	0.628	-0.435 – 0.720	
Availability of public transport service in the village	0.143	0.156	0.92	0.36	-0.163 – 0.449	
Travel time for children to reach school (one way)	-0.522	0.208	-2.5	0.012	-0.930 – -0.113	**
Cut point (intercept)	-1.608	1.442	–	–	-4.434 – 1.219	

Table 48.1: Model Statistics

Indicator	Value
Mean dependent variable	1.55
Standard deviation	0.5
Pseudo R ²	0.066
Number of observations	111
Chi-square	10.081
Prob > chi ²	0.073
Akaike Information Criterion (AIC)	154.706
Bayesian Information Criterion (BIC)	170.963



Significance levels: * $p < 0.01$, ** $p < 0.05$, * $p < 0.10$**

The regression results in table 48 and 48.1 examines how transport infrastructure and accessibility influence the likelihood that households miss school or other essential services due to transport barriers. Among the explanatory variables, travel time for children to reach school is the only factor showing a statistically significant relationship with education access ($p = 0.012$). The negative coefficient indicates that longer travel times increase the likelihood that students miss school due to transport constraints. This finding highlights the importance of proximity and travel duration in determining consistent school attendance in rural communities. In contrast, other transport-related variables including road type, road condition, year-round accessibility, and availability of public transport services do not show statistically significant relationships in this model. This suggests that, while infrastructure quality may influence general mobility, the actual distance and time required to reach school may play a more direct role in determining whether students miss educational opportunities. The overall model is marginally significant (Chi-square = 10.081; $p = 0.073$), indicating that transport factors collectively contribute to explaining variation in missed school attendance due to transport barriers. The pseudo- R^2 value of 0.066 suggests that transport accessibility explains a moderate share of the observed variation, while other factors such as household socio-economic conditions, school availability, and seasonal labor demands may also influence educational participation. Overall, the findings emphasize that travel time and accessibility to schools remain critical determinants of education continuity, particularly in rural areas where long travel distances and limited transport options increase the risk of absenteeism.

6.3.5.8 Social Connectivity and Transport Accessibility

This subsection examines how the availability and accessibility of land transport services influence social connectivity within rural communities. The analysis focuses on whether transport constraints limit participation in community events such as meetings, funerals, and ceremonies. The dependent variable measures whether people miss community events due to lack of transport, while key transport-related factors such as road type, road condition, availability of public transport services, transport reliability, and frequency of visits to neighboring villages were included as explanatory variables.

Table 49: Ordered Logistic Regression Results – Effect of Transport Conditions on Social Connectivity

Variables	Coefficient	Std. Error	t-value	p-value	95% Confidence Interval	Significance
Main type of road connecting village to nearest town/service center	-0.425	0.309	-1.37	0.169	-1.032 – 0.181	
Overall condition of the main road near household	-0.12	0.17	-0.71	0.48	-0.452 – 0.213	



Variables	Coefficient	Std. Error	t-value	p-value	95% Confidence Interval	Significance
Availability of public transport service in the village	0.241	0.102	2.36	0.018	0.041 – 0.441	**
Frequency of transport being unavailable when needed	-0.269	0.163	-1.65	0.098	-0.588 – 0.050	*
Frequency of visits to neighboring villages or towns	0.142	0.11	1.28	0.2	-0.075 – 0.358	
Cut point (intercept)	-1.173	0.975	–	–	-3.085 – 0.738	

Table 49.1: Model Statistics

Indicator	Value
Mean dependent variable	1.545
Standard deviation	0.499
Pseudo R ²	0.031
Number of observations	277
Chi-square	11.93
Prob > chi ²	0.036
Akaike Information Criterion (AIC)	381.814
Bayesian Information Criterion (BIC)	403.559

Significance levels: * $p < 0.01$, ** $p < 0.05$, * $p < 0.10$**

The regression results in table 49 and 49.1 indicate that certain transport-related factors influence the likelihood that people miss community events due to transport constraints. Among the explanatory variables, availability of public transport services in the village shows a statistically significant relationship with social connectivity ($p = 0.018$). This suggests that the presence of public transport services plays an important role



in enabling residents to participate in community activities. Where transport services are available, the probability of missing social events due to transport barriers tends to decrease. The frequency with which transport is unavailable when needed also shows a marginally significant relationship ($p = 0.098$). The negative coefficient suggests that unreliable transport services may increase the likelihood that residents miss social gatherings, highlighting the importance of service reliability in maintaining community interaction. Other variables, including road type, road condition, and frequency of visits to neighboring villages or towns, do not show statistically significant effects in this model. This indicates that while road infrastructure remains important for general mobility, the availability and reliability of transport services may play a more direct role in enabling social participation. Overall, the model is statistically significant (Chi-square = 11.930; $p = 0.036$), indicating that transport-related factors collectively influence social connectivity outcomes. However, the relatively low pseudo- R^2 value (0.031) suggests that other factors such as cultural practices, household priorities, and social obligations may also shape participation in community events. Despite this, the findings emphasize that improving transport availability and reliability can enhance social interaction and strengthen community cohesion in rural areas.

6.4 Stakeholders and field recommendations

6.4.1 Identification of the Most Urgent Improvements for Rural Transport Services

This subsection summarizes stakeholders' views on the most urgent improvements needed for rural transport services, based on survey responses. These priorities reflect key constraints identified across communities.

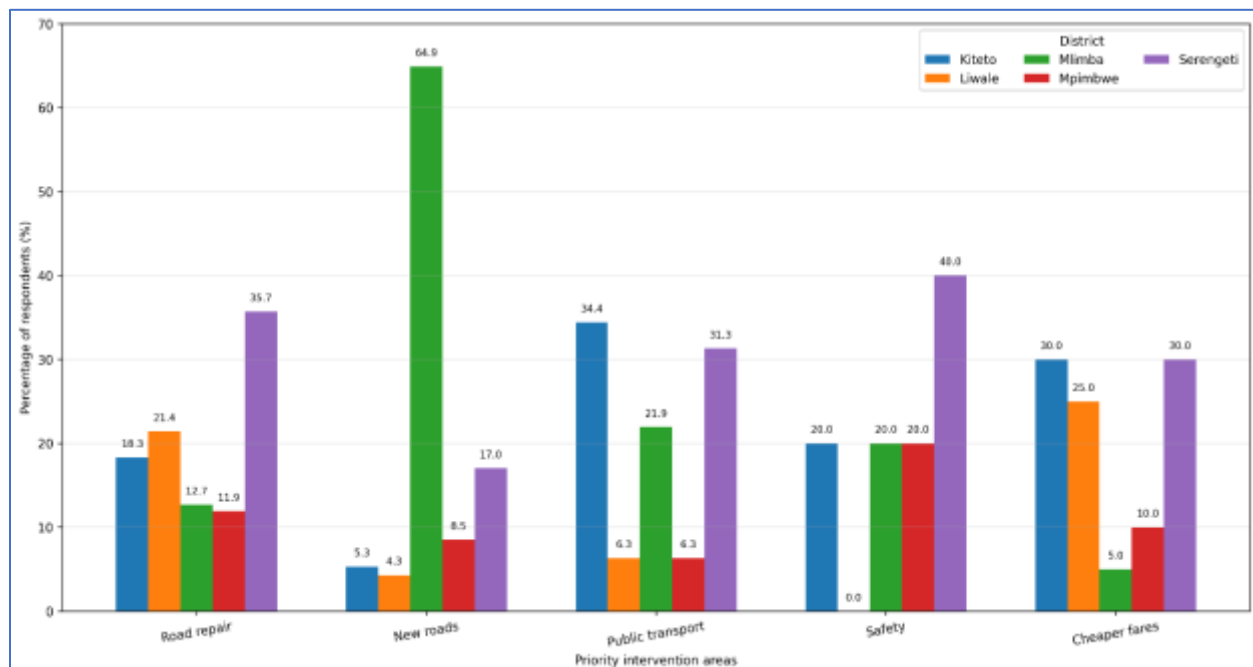


Figure 40: Most Urgent Transport Needs Identified by Stakeholders

The findings in figure 40 show that priorities vary across districts but road infrastructure remains central. New road construction is the main priority in Mlimba (64.9%), indicating major gaps in connectivity. Road repair is



most emphasized in Serengeti (35.7%) and Liwale (21.4%), reflecting poor existing road conditions. Service-related needs are also important. Public transport services are highlighted in Kiteto (34.4%) and Serengeti (31.3%), while cheaper fares are noted in Kiteto and Serengeti (30.0% each). Safety improvements are particularly emphasized in Serengeti and Mpimbwe (20.0%–40.0%), showing concerns about road risks. Overall, the results indicate that stakeholders prioritize both infrastructure improvement (repair and construction) and service-related needs, with strong variation depending on local conditions.

Roads First, Then Bridges, Then Reliable Transport

Across focus group discussions and key informant interviews, stakeholders consistently described rural transport improvement as a sequence: first ensure roads are passable, then strengthen crossing points (bridges, culverts, drainage), and only thereafter expand reliable transport services. High fares, limited vehicles, and emergency delays were widely viewed as consequences of weak infrastructure rather than standalone problems. Participants from Morogoro Region emphasized the need to upgrade main corridors to more durable standards:

“We request help to construct asphalt roads. During the rainy season, water floods the roads and vehicles get stuck.” — Community Representative, Morogoro Region

District-level officials similarly linked service disruptions to drainage and culvert gaps:

“Major gaps include roads without culverts, flooding, and impassable roads in the rainy season.” — Interview respondent, Morogoro Region

In Manyara Region, transport authority representatives highlighted bridges and culverts as practical solutions to recurring washouts and climate-related damage:

“We have been constructing bridges and culverts to reduce these challenges.” — Interview respondent, Manyara Region

Several themes consistently emerged: infrastructure as the root cause of service gaps, climate-driven disconnection, and the need for durability and drainage. Stakeholders converged on what can be described as a systems-level solution roads engineered for water management and resilience, rather than short-term patching.

6.4.2 Leadership responsibility for improving transport services

This subsection summarizes community views on who should take the lead in improving transport, based on survey responses. These views reflect expectations on roles and accountability.

Table 50: Stakeholders’ Views on Who Should Lead Transport Improvements



District	Central govt (%)	Local govt (%)	NGOs (%)	Community groups (%)	Private sector (%)	Total (%)
Kiteto	23.8	7.6	0	0	0	16.6
Liwale	20	4.8	0	0	50	13.7
Mlimba	18.8	46.7	66.7	100	0	31.1
Mpimbwe	10.6	10.5	0	0	0	10.1
Serengeti	26.9	30.5	33.3	0	50	28.5
Total	100	100	100	100	100	100

The findings in table 50 show that responsibility is shared across different actors, though emphasis varies by district. Central government is strongly recognized, particularly in Serengeti (26.9%) and Kiteto (23.8%), indicating expectations for national-level leadership. Local government plays a key role in Mlimba (46.7%) and Serengeti (30.5%), showing the importance of decentralized action. Other actors are also mentioned. NGOs and community groups are especially highlighted in Mlimba, while private sector involvement is notable in Liwale and Serengeti (50.0%). Overall, the results suggest that while government both central and local remains central, stakeholders also recognize roles for private sector and other actors, depending on local context.

Central Government Expected to Lead, Local Authorities to Implement

Participants consistently placed primary responsibility for rural transport improvement on government particularly central government while recognizing agencies and local councils as implementing bodies. Community contributions were discussed mainly as supportive measures rather than substitutes for public investment.

A participant from Katavi Region expressed this clearly:

“The government has the main responsibility it is not easy for individuals to fund large-scale transport projects.” — FGD Participant, Katavi Region

In Lindi Region, a community representative linked infrastructure gaps to limited preparedness and follow-through:

“The main reason is government preparedness; constructing culverts and bridges would solve many issues.” — Community Representative, Lindi Region

Similarly, a representative from Manyara Region highlighted the role of financial allocation:

“The availability of funds affects maintenance.” — Community Representative, Manyara Region



Stakeholder narratives consistently frame transport infrastructure as a public good that requires public leadership. Key themes include state obligation, adequate budgeting and preparedness, clearly defined institutional roles, and expectations of accountability in implementation and maintenance.

6.4.3 Community willingness to contribute to road maintenance

This subsection examines whether households are willing to contribute to road maintenance efforts, based on survey responses. Community participation is important for sustaining rural road improvements.

Table 51: Community Willingness to Contribute to Road Maintenance

District	Yes (%)	No (%)	Maybe (%)	Total (%)
Kiteto	16.3	18.8	14.8	16.6
Liwale	15.4	12.5	3.7	13.7
Mlimba	35.2	14.6	29.6	31.1
Mpimbwe	2.5	29.2	33.3	10.1
Serengeti	30.7	25	18.5	28.5
Total	100	100	100	100

The findings in table 51 show that willingness to contribute varies across districts. Strong willingness is observed in Mlimba (35.2%) and Serengeti (30.7%), indicating higher readiness for community involvement. Kiteto and Liwale also show moderate willingness, though with a noticeable share of respondents unwilling to contribute. In Mpimbwe, willingness is relatively low (2.5%), while a larger share report uncertainty (33.3%) or unwillingness (29.2%), suggesting hesitation or unclear arrangements. A significant number of respondents, particularly in Mlimba and Mpimbwe, indicated that participation depends on conditions, highlighting the importance of clear organization, fairness, and support. Overall, the results suggest that while many communities are open to contributing, effective engagement will depend on structured approaches and local context.

Willingness Exists, But Only Under Clear Leadership and Technical Support

Communities frequently expressed willingness to contribute labor such as clearing drains, placing stones, and conducting minor repairs particularly when rainy-season damage blocks movement. However, respondents also emphasized clear limits: community labor cannot substitute for engineered works, machinery, or formal budget allocations.

In Lindi Region, women described their willingness as dependent on structured leadership and oversight:

“We are willing to contribute labor if senior leaders guide and supervise this effort.” — FGD Participant, Lindi Region



In Mara Region, community representatives noted that local maintenance efforts are constrained by limited technical knowledge:

“Maintenance is weak because most people lack education on infrastructure maintenance.” — Community Representative, Mara Region

Similarly, a representative from Katavi Region stressed the importance of financial support:

“Financial support is crucial; community efforts alone are insufficient.” — Community Representative, Katavi Region

The qualitative evidence points to what can be described as a participation ceiling. Community labor functions as a coping mechanism, but engineering capacity and financial resources remain binding constraints. While communities are prepared to contribute, effective outcomes depend on structured leadership, technical guidance, and sustained public investment.

6.4.4 Preferred transport type to best serve the community

This subsection examines the type of transport communities consider most suitable for their needs, based on survey responses. Preferences reflect existing gaps, road conditions, and demand for reliable services.

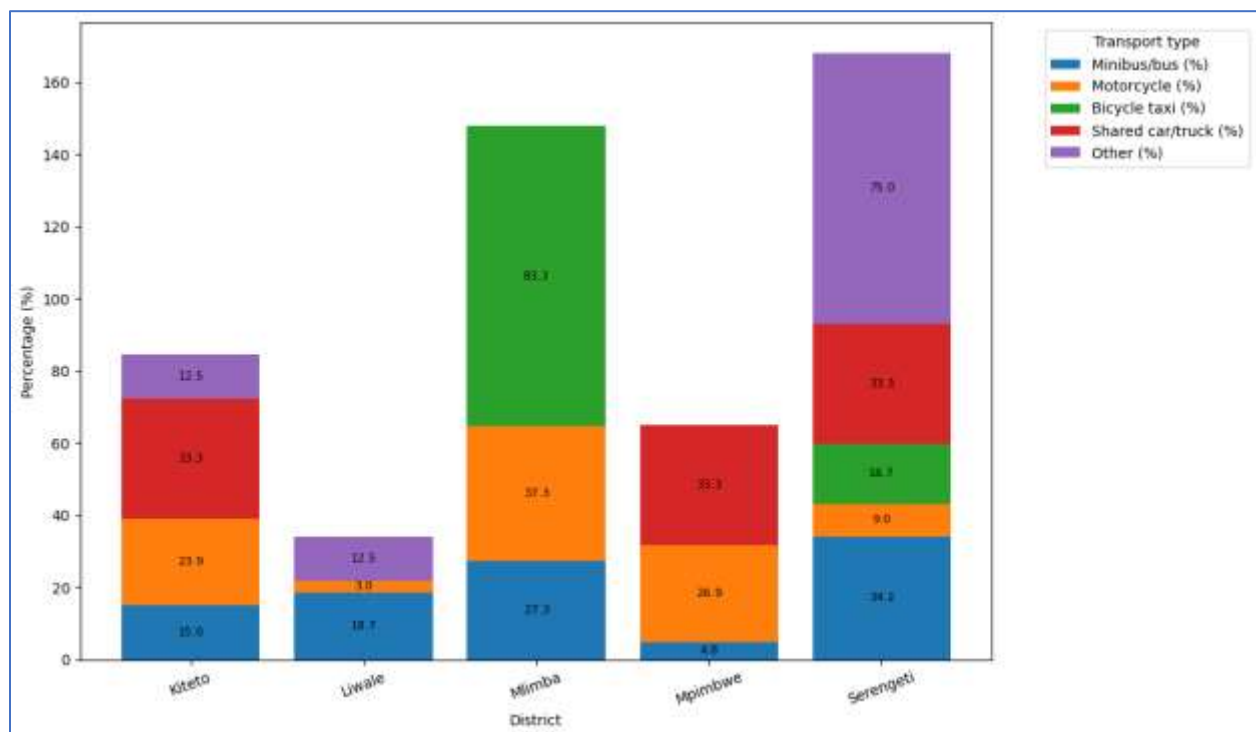


Figure 41: Preferred Transport Type for the Community

The findings in figure 41 show that preferences vary across districts, reflecting differences in local conditions and needs. Minibuses or buses are strongly preferred in Serengeti (34.2%) and Mlimba (27.3%), indicating demand for more structured and higher-capacity transport services. At the same time, motorcycle taxis are



highly valued in Mlimba (37.3%) and Mpimbwe (26.9%), reflecting their ability to operate on poor or less accessible roads. Shared cars or trucks are important in Kiteto, Mpimbwe, and Serengeti (around 33.3%), suggesting a need for flexible transport options. Some districts also show interest in alternative options, including bicycle taxis in Mlimba and other transport types in Serengeti. Overall, the results indicate that communities prefer a mix of transport options, combining reliable public transport with flexible modes suited to varying road conditions.

Shift From Motorcycles to Safer Vehicles, Especially for Emergencies

Although motorcycles and motor tricycles dominate everyday rural mobility, participants consistently expressed a preference for expanding vehicle-based services such as minibuses, small buses, and ambulances particularly for emergencies and vulnerable users. Motorcycles were widely viewed as unsafe for pregnant women, patients, elderly persons, and individuals with disabilities. A community representative from Morogoro Region emphasized the need for faster and more reliable vehicle services:

“I suggest more vehicles and small buses for fast transport.” — Community Representative, Morogoro Region

In Katavi Region, participants linked vehicle preference to safety and dignity:

“We prefer vehicles rather than motorcycles motorcycles are not safe for patients, pregnant women, or elders.” — FGD Participant, Katavi Region

In Lindi Region, participants representing persons with disabilities highlighted the need for structured transport systems:

“We need transport stations to assist people with disabilities.” — FGD Participant (Person with Disability), Lindi Region

Transport preferences are therefore closely tied to risk reduction and equity. Expanding safer, more inclusive vehicle-based options is viewed not only as a mobility improvement, but as a necessary step toward protecting vulnerable populations and ensuring dignified access to essential services.

6.4.5 Incentives encouraging community participation in transport activities

6.4.5 Incentives Encouraging Community Participation in Transport Activities

This subsection examines which incentives would motivate community members to participate in transport-related activities such as road maintenance, based on survey responses. Understanding these preferences is important for designing effective and inclusive engagement strategies.

Table 52: Incentives Encouraging Community Participation in Transport Activities



District	Food-for-work (%)	Cash-for-work (%)	Equipment/tools (%)	Recognition roles (%)	Training (%)	Total (%)
Kiteto	7.4	14.3	7.3	42.9	36.6	16.6
Liwale	11.1	14.3	4.9	0	24.4	13.7
Mlimba	7.4	36	56.1	14.3	4.9	31.1
Mpimbwe	37	5.6	9.8	0	12.2	10.1
Serengeti	37	29.8	22	42.9	22	28.5
Total	100	100	100	100	100	100

The findings in table 52 show that preferred incentives differ across districts, reflecting local priorities and conditions. Cash-for-work is strongly emphasized in Mlimba (36.0%) and Serengeti (29.8%), indicating that financial incentives remain important in motivating participation. However, equipment and tools are the leading preference in Mlimba (56.1%), suggesting a strong need for practical resources to support road work. Recognition or leadership roles are highly valued in Kiteto and Serengeti (42.9%), pointing to the importance of social incentives and community status in some areas. In contrast, food-for-work is particularly important in Mpimbwe and Serengeti (37.0%), showing that basic support can still be a key motivator in certain contexts. Training is also relevant, especially in Kiteto (36.6%) and Liwale (24.4%), indicating interest in building skills alongside participation. Overall, the results suggest that no single incentive is sufficient on its own. A combination of financial support, tools, training, and recognition is likely to be most effective in encouraging sustained community participation in transport activities.

Employment, Local Ownership, and Fair Systems as Motivation

Participants framed incentives for transport improvement less in terms of direct financial compensation and more around practical, shared benefits: youth employment, reliable access, fair fares, and visible accountability. Communities expressed greater willingness to support initiatives when they see tangible improvements in mobility and transparent management of resources.

A youth participant from Katavi Region linked transport development to employment and social stability:

“If youth are given employment opportunities through transport services, they will be productively engaged.” — FGD Participant, Katavi Region

In Mara Region, community representatives emphasized the importance of predictable fare systems alongside infrastructure upgrades:



“Fares should be regulated because they fluctuate due to bad roads.” — Community Representative, Mara Region

Participants from Katavi Region also highlighted accountability as a key motivator:

“Funds or equipment should not be misused we need real accountability.” — FGD Participant, Katavi Region

The qualitative evidence suggests that incentives cluster around three themes: economic inclusion (particularly youth livelihoods), trust and accountability in governance, and predictability in fares and service access. Community participation strengthens when improvements are visible, benefits are fairly distributed, and institutional processes are transparent.

7. Discussion

This study set out to assess the availability and accessibility of land transport services in rural areas of Mainland Tanzania and to examine their socio-economic implications. The findings clearly demonstrate that rural transport challenges remain structural, persistent, and deeply interconnected with broader development outcomes. Despite ongoing policy reforms and institutional efforts, transport infrastructure quality and service availability continue to fall short of meeting rural mobility needs.

7.1 Dominance of Low-Standard Roads and Seasonal Inaccessibility

The findings confirm that rural connectivity in the study areas is overwhelmingly dependent on earth and low-quality gravel roads, with more than four-fifths of households relying on dirt roads as their main access routes. These roads are highly vulnerable to weather conditions and provide limited year-round usability. Over 80 percent of households reported that roads are either usable only during the dry season, rarely accessible, or completely impassable at certain times of the year. This reinforces earlier national and international evidence that rural road networks in Tanzania remain fragile and climate-sensitive, undermining consistent access to services and markets (URT, 2003; World Bank, 2012).

The qualitative evidence further illustrates that seasonal isolation is not incidental but predictable. Flooding, erosion, and the absence of drainage and durable structures repeatedly disrupt connectivity, particularly during the rainy season. These findings align with prior assessments that identify weak drainage and limited preventive maintenance as major contributors to rapid road deterioration in rural Tanzania (LATRA, 2020; URT, 2021). The study therefore supports the argument that improving road durability and climate resilience is more critical than expanding nominal road coverage alone.

7.2 Transport Service Availability Shaped by Road Conditions

Beyond physical infrastructure, the study shows that transport service availability is directly shaped by road condition and profitability rather than by demand alone. Nearly half of surveyed villages lack any form of regular public transport, while existing services operate irregularly and are often suspended during the rainy season. Motorcycles dominate rural mobility, reflecting their ability to operate on poor roads, but this



dominance also signals the exclusion of safer and higher-capacity Transport means. Transport service providers consistently reported avoiding certain areas, canceling trips, or abandoning routes due to unsafe or unprofitable road conditions. This finding supports earlier literature indicating that market-driven transport provision in low-density rural areas struggles to function without adequate infrastructure support (URT, 2003; World Bank, 2006). While LATRA regulates fares and service standards, the study indicates that regulatory frameworks alone cannot ensure service availability where infrastructure conditions make operations commercially and physically unviable (LATRA, 2020).

7.3 Affordability, Vulnerability, and Unequal Transport Burdens

Affordability emerges as a major constraint to rural mobility. Transport fares increase significantly during the rainy season, driven by higher operating costs, vehicle damage, and risk. More than three-quarters of households reported seasonal fare increases, while transport providers overwhelmingly perceived rural transport as unaffordable for most residents. This finding is consistent with earlier evidence that transport costs in rural Tanzania often consume a disproportionate share of household income (URT, 2001).

The burden of poor transport access falls disproportionately on vulnerable groups. Pregnant women, elderly persons, persons with disabilities, and students were repeatedly identified as facing the greatest transport difficulties. The near absence of adapted or inclusive transport services means that these groups rely on unsafe, informal, or prohibitively expensive options. These results echo global and national studies showing that transport systems that are not designed with equity in mind reinforce social exclusion and deepen vulnerability (United Nations, 2015; World Bank, 2012).

7.4 Impacts on Livelihoods, Education, and Health

The study provides strong evidence that inadequate transport directly undermines rural livelihoods. Most households reported reduced income due to transport constraints, primarily through restricted market access, delayed delivery of goods, and increased transaction costs. Poor roads enable market exploitation, spoilage of perishable goods, and distress sales, reinforcing the link between transport quality and rural poverty highlighted in earlier studies (World Bank, 2006; AfDB, 2017).

Education access is similarly affected. Long travel distances, extended travel times, and seasonal inaccessibility contribute to lateness, absenteeism, and school dropout. Nearly half of households reported that children missed school due to transport problems, and one-third reported school changes or dropout linked to transport challenges. These findings align with broader evidence that transport barriers significantly affect human capital development in rural contexts (URT, 2021; United Nations, 2015).

Health and emergency access emerge as the most critical impact area. Transport delays frequently prevent timely access to healthcare, with severe consequences for maternal and emergency cases. Regression results further confirm that poor road condition, rather than road type alone, is significantly associated with health-related delays. This reinforces existing literature linking rural road quality to health outcomes and avoidable mortality (World Bank, 2012; United Nations, 2015).



7.5 Governance, Community Participation, and Systemic Constraints

Stakeholders consistently identified road infrastructure improvement as the most urgent intervention, with strong expectations that central and local government should lead. While communities expressed high willingness to contribute to road maintenance, qualitative evidence shows clear limits to what community labor can achieve without technical support, funding, and durable engineering solutions. This supports earlier findings that community participation is most effective when embedded within well-resourced and accountable institutional frameworks (URT, 2021; LATRA, 2020).

Overall, the findings suggest that rural transport challenges are systemic rather than isolated. Weak infrastructure, limited-service availability, high costs, and social exclusion reinforce one another, creating a cycle of constrained mobility and underdevelopment. Addressing these challenges requires integrated investment in durable road infrastructure, targeted regulatory and financial mechanisms to support rural transport services, and explicit attention to equity and climate resilience.

8. Strategic Recommendations

This section outlines strategic and actionable recommendations to strengthen the availability, accessibility, affordability, and safety of rural land transport services in Mainland Tanzania. The recommendations are derived directly from the study findings and reflect realistic regulatory, institutional, and operational conditions in the country. They are structured to distinguish actions that fall within LATRA's direct mandate from those that require collaboration with other actors, while maintaining LATRA's leadership and coordination role.

A. Strategic Recommendations to Be Addressed Directly by LATRA

No.	Recommendation	Timeframe	Strategic Justification	Rationale
1	Develop and issue differentiated rural transport service frameworks based on road typologies (earth, gravel, seasonal roads)	Short–Medium Term	Rural transport services are highly shaped by road conditions, with over 84% of roads being earth/gravel and largely seasonal	A uniform regulatory approach is ineffective; differentiated frameworks will enable realistic licensing, service standards, and enforcement tailored to rural realities
2	Formalize and regulate dominant informal transport modes (bodaboda and bajaji) through simplified rural licensing regimes	Short Term	Informal modes account for over 67%–80% of rural mobility and operate with limited oversight	Formalization improves safety, service reliability, accountability, and data capture while preserving flexibility of these modes



No.	Recommendation	Timeframe	Strategic Justification	Rationale
3	Introduce seasonal fare regulation guidelines (dry vs rainy season bands)	Short Term	Transport fares increase sharply during rains due to risk and road conditions, making services unaffordable for vulnerable groups	Structured fare bands balance operator sustainability with consumer protection, reducing exploitation during peak vulnerability periods
4	Establish a Rural Transport Service Obligation (RTSO) regulatory mechanism	Medium Term	Nearly 46% of rural communities lack reliable transport services	RTSO can define minimum service levels (frequency, coverage) and create a regulatory basis for incentivized service provision in underserved areas
5	Promote appropriate rural vehicle typologies through regulatory guidance and targeted licensing incentives (Include required instruction)	Short–Medium Term	Transport services are constrained by poor road conditions and operator reluctance during rainy seasons	There is a need to recommend appropriate types of transport for rural areas, considering the nature of roads and the reluctance of vehicle owners to operate during the rainy season. It was suggested that vehicles such as daladala (e.g., “Chai Maharage” type) could be introduced. Additionally, there is a proposal to promote more resilient vehicles such as Land Cruisers (e.g., Mbulu–Manyara routes), as well as the use of bajaji, which are preferred by passengers due to shorter waiting times. LATRA may also consider providing incentives (within legal and policy frameworks) to encourage operators to invest in such vehicles.



No.	Recommendation	Timeframe	Strategic Justification	Rationale
6	Establish a rural transport data and monitoring system at ward level	Medium Term	There is limited real-time data on rural service availability, frequency, and performance	Continuous data enables evidence-based regulation, route planning, and performance monitoring
7	Strengthen rural passenger protection mechanisms (complaints, safety enforcement, standard setting)	Short Term	Rural users face safety risks, overcharging, and lack of recourse mechanisms	Enhances accountability, builds trust, and improves service quality
8	Introduce rural-focused regulatory flexibility (adaptive licensing, route clustering, shared services)	Medium Term	Low demand density makes conventional transport models commercially unviable	Flexible regulation enables innovative service models suited to rural realities

B. Strategic Recommendations to Be Addressed Jointly by LATRA and Other Stakeholders

No.	Recommendation	Lead / Key Partners	Timeframe	Strategic Justification	Rationale	Implications for LATRA
1	Prioritize climate-resilient rural road improvements (drainage, culverts, spot improvements)	TARURA, LGAs	Medium–Long Term	81.6% of roads are seasonally inaccessible, causing isolation	Improving road resilience directly increases transport availability and reduces seasonal disruption	Enables more stable transport regulation and service continuity
2	Introduce targeted rural transport subsidy or incentive schemes for operators	LATRA, MoWT, LGAs, Development Partners	Medium Term	Operators avoid rural routes due to low profitability and high risk	Incentives can stimulate service provision in underserved	LATRA defines eligibility, compliance, and



No	Recommendation	Lead / Key Partners	Timeframe	Strategic Justification	Rationale	Implications for LATRA
					and remote areas	performance standards
3	Develop integrated rural transport service models (multi-modal hubs linking motorcycles, bajaji, minibuses)	LATRA, LGAs, Private Sector	Medium Term	Fragmented and informal transport systems limit efficiency and coverage	Integrated systems improve connectivity, reduce travel time, and optimize existing modes	LATRA regulates integration standards and licensing structures
4	Establish emergency and community transport schemes (ambulance networks, community vehicles)	MoH, LGAs, NGOs	Short–Medium Term	Nearly 49% of households failed to access healthcare due to transport constraints	Dedicated emergency transport reduces mortality and improves health outcomes	LATRA supports regulatory framework and safety standards
5	Promote inclusive transport services targeting vulnerable groups (PWDs, elderly, pregnant women)	LATRA, LGAs, Social Services	Medium Term	Vulnerable groups face the highest barriers in cost, access, and safety	Inclusive design improves equity and participation in economic and social life	LATRA incorporates inclusion requirements into licensing and standards
6	Strengthen coordination between LATRA, TARURA, and LGAs through formal rural transport coordination platforms	LATRA, TARURA, LGAs	Short Term	Weak coordination leads to mismatch between road improvements and service provision	Joint planning ensures infrastructure and services are aligned	LATRA gains influence in infrastructure-service integration



No	Recommendation	Lead / Key Partners	Timeframe	Strategic Justification	Rationale	Implications for LATRA
7	Support development of rural transport cooperatives and operator associations	LATRA, LGAs, Financial Institutions	Medium Term	Informal operators lack organization, financing, and bargaining power	Cooperatives improve service reliability, access to finance, and compliance	LATRA regulates and strengthens structured operator networks
8	Facilitate access to financing mechanisms for resilient rural transport vehicles	LATRA, Banks, Development Partners	Medium–Long Term	High upfront costs limit investment in appropriate vehicles	Financing unlocks transition to durable, road-appropriate fleets	LATRA defines eligible vehicle categories and compliance standards

9. Future Studies Recommended by Tawi Consult to LATRA

Tawi Consult recommends that LATRA undertake the following priority studies to deepen understanding, address critical evidence gaps, and guide more effective interventions for improving rural land transport services in Mainland Tanzania.

(a) Feasibility Study on Appropriate Rural Transport Vehicle Typologies

Objective: To identify and evaluate the most suitable, cost-effective, and resilient vehicle types for different rural road conditions and geographic contexts.

Justification: The study findings show that transport services are highly constrained by poor road conditions and seasonal inaccessibility, leading to operator reluctance and service gaps.

Key Areas of Analysis:

- Performance of vehicles (daladala, 4WD vehicles, bajaji, motorcycles) across road types
- Cost-benefit analysis of vehicle investment vs operational returns
- Passenger preferences and safety considerations
- Seasonal operability and durability



Expected Outcome: Evidence-based guidelines for promoting vehicle types that improve service reliability and reduce seasonal disruption.

(b) Study on Sustainable Financing and Incentive Models for Rural Transport Services

Objective: To design viable financial and regulatory incentive mechanisms that encourage operators to serve low-demand and high-risk rural routes.

Justification: The report highlights that rural transport markets are constrained by low profitability, high operational costs, and seasonal risks.

Key Areas of Analysis:

- Subsidy models (output-based aid, route-based incentives)
- Public-private partnership (PPP) models
- Credit and leasing schemes for rural operators
- Comparative analysis of international rural transport financing models

Expected Outcome: A framework for incentivizing service provision in underserved areas while ensuring financial sustainability.

(c) Longitudinal Study on Seasonal Accessibility and Transport Reliability

Objective: To track how transport availability, costs, and service patterns change across seasons and over time.

Justification: Seasonal inaccessibility is identified as a systemic issue, with many roads becoming impassable during rains.

Key Areas of Analysis:

- Seasonal variations in transport supply and pricing
- Impact of rainfall on road usability and service frequency
- Coping strategies used by rural communities
- Long-term trends in accessibility

Expected Outcome: Improved planning tools for seasonal service regulation and infrastructure prioritization.

(d) Study on Rural Transport Service Integration Models

Objective: To explore how different transport modes (bodaboda, bajaji, minibuses, buses) can be integrated into efficient, multi-modal rural transport systems.



Justification: The current system is fragmented, with heavy reliance on informal and disconnected transport modes.

Key Areas of Analysis:

- Feeder-main route integration models
- Hub-and-spoke transport systems
- Role of digital platforms in coordinating services
- Case studies of integrated rural transport systems

Expected Outcome: A model for coordinated, efficient rural mobility systems that reduce travel time and costs.

(e) Study on Affordability and Equity in Rural Transport Services

Objective: To assess how transport costs affect different population groups and identify mechanisms to improve affordability.

Justification: Transport costs are reported as a major barrier, especially for vulnerable groups such as women, elderly persons, and people with disabilities.

Key Areas of Analysis:

- Transport expenditure as a share of household income
- Gender and vulnerability dimensions of transport access
- Fare regulation effectiveness
- Social protection mechanisms (e.g., targeted subsidies)

Expected Outcome: Policy options to ensure equitable and inclusive access to transport services.

(f) Study on the Impact of Rural Transport on Economic Productivity and Market Access

Objective: To quantify the relationship between transport access and rural economic outcomes, particularly agriculture and trade.

Justification: The report shows that poor transport significantly reduces income and market participation.

Key Areas of Analysis:

- Transport constraints and farm-gate pricing
- Post-harvest losses linked to transport delays



- Market access and price differentials
- Impact on small enterprises and rural employment

Expected Outcome: Evidence to support investment prioritization in transport as a driver of economic growth.

(g) Study on Rural Transport Safety and Risk Factors

Objective: To assess safety risks associated with dominant rural transport modes and propose mitigation strategies.

Justification: Increased reliance on motorcycles and poor road conditions exposes users to high safety risks.

Key Areas of Analysis:

- Accident patterns and causes in rural areas
- Safety standards for informal transport modes
- Infrastructure-related risks (e.g., lack of signage, poor road conditions)
- Behavioral and enforcement factors

Expected Outcome: Targeted safety interventions and regulatory improvements.

(h) Study on Digital Solutions and Innovation in Rural Transport Services

Objective: To explore how technology can improve coordination, efficiency, and accessibility of rural transport services.

Justification: The current system lacks coordination and real-time information, limiting efficiency.

Key Areas of Analysis:

- Mobile-based booking and dispatch systems
- Digital fare management
- Data collection and monitoring tools
- Integration with existing informal transport networks

Expected Outcome: Innovative, scalable solutions to modernize rural transport systems.

(i) Institutional and Regulatory Effectiveness Study for Rural Transport



Objective: To evaluate how existing regulatory frameworks perform in rural contexts and identify areas for reform.

Justification: The report highlights that regulatory approaches are not fully adapted to rural realities.

Key Areas of Analysis:

- Effectiveness of current licensing and enforcement mechanisms
- Barriers to compliance for rural operators
- Institutional coordination gaps
- Comparative regulatory approaches in similar contexts

Expected Outcome: A refined, context-sensitive regulatory framework for rural transport.

(j) Study on Community-Based Rural Transport Models

Objective:

To assess the viability of community-led transport initiatives in improving service availability.

Justification:

Communities often rely on informal coping mechanisms due to lack of formal services.

Key Areas of Analysis:

- Community-managed transport schemes
- Local ownership and sustainability models
- Role of cooperatives and associations
- Integration with formal regulatory systems

Expected Outcome: Scalable community-driven solutions for improving access in remote areas.



10. Conclusion

This study set out to assess the availability and accessibility of land transport services in rural areas of Mainland Tanzania and to examine their implications for livelihoods, access to social services, and social inclusion. The findings provide clear and consistent evidence that rural transport challenges remain systemic, structural, and deeply intertwined with broader development outcomes. Despite notable policy reforms and institutional efforts, rural transport systems continue to fall short of meeting the everyday mobility needs of a large proportion of the rural population.

The assessment confirms that rural connectivity is still dominated by low-standard earth and gravel roads that are highly vulnerable to seasonal disruption. Poor road condition, weak drainage, and limited maintenance render many routes impassable during the rainy season, leading to predictable isolation of villages. These infrastructure constraints directly shape the availability, reliability, and cost of transport services. Where roads deteriorate, transport operators withdraw or limit services, fares rise sharply, and mobility becomes uncertain and uneven. As a result, transport access in rural areas is not only limited but also unstable.

The study further demonstrates that transport challenges have far-reaching socio-economic consequences. Restricted mobility undermines market access and household incomes, disrupts education through lateness, absenteeism, and dropout, and delays or prevents access to health and emergency services. The impacts are most severe for vulnerable groups, including pregnant women, elderly persons, persons with disabilities, and students, who face heightened risks, higher costs, and fewer safe transport options. In this context, transport is not merely a sectoral issue but a foundational determinant of equity, human development, and rural resilience.

Importantly, the findings highlight that many transport challenges are not primarily regulatory in nature but are rooted in infrastructure quality, service viability, and affordability. Nevertheless, the role of regulation remains critical. Effective, context-sensitive regulation can protect users, improve service reliability, and support the sustainability of rural transport markets, particularly when aligned with infrastructure planning and local realities. The study underscores the need for LATRA to continue evolving its regulatory approach to reflect the distinctive characteristics of rural transport systems, including informality, seasonality, and low-demand environments.

The strategic recommendations presented in this report provide a practical and phased pathway for strengthening rural land transport services. They emphasize the importance of targeted regulatory actions, stronger coordination between LATRA and infrastructure and service-delivery institutions, and sustained investment in durable, climate-resilient rural roads. Equally, they highlight the value of community participation, inclusive service design, and evidence-based decision-making as essential elements of long-term success.

In conclusion, improving rural land transport in Tanzania requires a coordinated, system-wide response that recognizes transport as a public good and a catalyst for inclusive development. By combining responsive regulation, strategic partnerships, and sustained infrastructure investment, Tanzania can progressively



reduce rural isolation, enhance access to essential services, and unlock the full socio-economic potential of its rural communities. This study provides a robust evidence base to support that effort and to guide future policy, regulatory, and investment decisions aimed at achieving equitable and sustainable rural mobility.

11. References

1. African Development Bank (AfDB). (2023). *African Economic Outlook: Infrastructure and Transport*. Abidjan: African Development Bank.
2. Asher, S., & Novosad, P. (2020). Rural roads and local economic development. *American Economic Review*, 110(3), 797–823.
3. Geurs, K. T., & van Wee, B. (2021). Accessibility evaluation of transport systems: Concepts and methods. *Journal of Transport Geography*, 94, 103107.
4. Institute for Transportation and Development Policy (ITDP). (2022). *Inclusive Transport and Mobility Report*. New York: ITDP.
5. International Transport Forum (ITF). (2021). *Transport Connectivity in Rural Areas*. Paris: OECD Publishing.
6. Land Transport Regulatory Authority (LATRA). (2020). *Five-Year Strategic Plan 2020/21–2024/25*. Dar es Salaam: LATRA.
7. Lucas, K., Mattioli, G., Verlinghieri, E., & Guzman, A. (2021). Transport poverty and social exclusion: A systematic review. *Transport Reviews*, 41(3), 353–374.
8. National Bureau of Statistics (NBS). (2022). *2022 Population and Housing Census: National Report*. Dodoma: Government of Tanzania.
9. National Bureau of Statistics (NBS). (2022). *Tanzania in Figures 2022*. Dodoma: Ministry of Finance and Planning.
10. Nguyen, H., & Nguyen, T. (2021). Transport and rural development in Vietnam. *Transport Policy*, 101, 1–10.
11. Organisation for Economic Co-operation and Development (OECD). (2021). *Rural Transport and Accessibility Policy Framework*. Paris: OECD Publishing.
12. Porter, G., Hampshire, K., Abane, A., Tanle, A., Esia-Donkoh, K., Obilie Amoako-Sakyi, R., & Owusu, S. (2021). Mobility, transport and rural livelihoods in Sub-Saharan Africa. *Journal of Transport Geography*, 94, 103113.
13. Rahman, M., Hossain, M., & Ahmed, S. (2022). Informal transport systems in developing countries: Challenges and opportunities. *Case Studies on Transport Policy*, 10(2), 1020–1028.



14. Tanzania Rural and Urban Roads Agency (TARURA). (2022). *Rural Roads Status Report*. Dodoma: TARURA.
15. United Nations Economic Commission for Africa (UNECA). (2024). *Infrastructure and Inclusive Growth in Africa*. Addis Ababa: UNECA.
16. United Nations Environment Programme (UNEP). (2024). *Climate Resilient Infrastructure Report*. Nairobi: UNEP.
17. United Nations Educational, Scientific and Cultural Organization (UNESCO). (2023). *Education Access and Transport Barriers*. Paris: UNESCO.
18. United Republic of Tanzania (URT). (2021). *Third Five-Year Development Plan (FYDP III) 2021/22–2025/26*. Dodoma: Ministry of Finance and Planning.
19. World Bank. (2022). *Rural Mobility and Development Report*. Washington, DC: World Bank.
20. World Bank. (2023). *Sub-Saharan Africa Transport Review*. Washington, DC: World Bank.
21. World Bank. (2025). *Better Roads, Better Off? Evidence from Rural Road Upgrading in Tanzania*. Washington, DC: World Bank.
22. World Bank. (2025). *Agriculture, Markets, and Connectivity*. Washington, DC: World Bank.
23. World Health Organization (WHO). (2022). *Transport and Health Access*. Geneva: WHO.