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# The Influence of Road Transport Infrastructure on Tourism Growth in Tanzania: A Case of Ruaha National Park

**Ligoha Samwel Zefania**

*Faculty of Logistics and Business Studies, National Institute of Transport, P. O Box 705, Dar es Salaam-Tanzania*

Samuelligoha05@gmail.com

***Abstract***— *This study assesses the influence of road transport infrastructure on tourism growth in Tanzania, focusing on Ruaha National Park. The main objectives were to assess the effects of road quality, accessibility, and networks on tourism growth. Adopting a positivist philosophy, a deductive approach, and a quantitative design, the research surveyed 353 tour operator companies, yielding 313 valid responses. Data were analyzed using descriptive and inferential statistics in SPSS. The findings indicate that road quality has a positive and statistically significant effect on tourism growth, demonstrating that improved road conditions enhance tourist access, satisfaction, and revenue generation. In contrast, road accessibility exhibited a negative but statistically insignificant relationship, implying that accessibility alone does not necessarily drive growth, possibly due to reliance on alternative transport modes and seasonal variations. However, road networks had a negative and statistically significant effect, suggesting that poorly integrated or misaligned networks can hinder tourist flows to Ruaha. Overall, the regression model was significant though it showed modest explanatory power. The study concludes that road quality is the most important determinant of tourism growth, while accessibility and networks require further contextual examination. Key recommendations include increased government investment in road maintenance and upgrading, stronger collaboration between Tanzania National Parks (TANAPA) and transport agencies to prioritize critical road sections, and greater involvement of tour operators in infrastructure feedback. It further calls for sustainable, strategically integrated road networks and future comparative research between northern and southern tourism circuits to inform balanced tourism policies.*

**Keywords**— Road transport infrastructure, tourism growth, road quality, road accessibility, Ruaha National Park

## I. INTRODUCTION

Road transport infrastructure plays a very important role in tourism growth because it affects how easily people can reach tourist attractions and the kind of experience they have. Tourism and transport work hand in hand without good transport systems, even places with great potential are not fully used (Jangra et al., 2023). In Tanzania, tourism contributes a lot to the economy through GDP, foreign exchange, and jobs (UNWTO, 2021). However, remote areas like Ruaha National Park still face challenges because of poor road access (Abdulkadr et al., 2022). Good road networks make it easier for tourists to travel, lower transport costs, and increase the attractiveness of destinations. Therefore, improving roads is not just about transport it is also about supporting tourism, creating economic opportunities, and promoting regional development (World Bank, 2020). Around the world, countries that invest in transport infrastructure have seen growth in tourist numbers. For example, in Southeast Asia, building road networks opened up remote beaches and cultural sites, leading to more visitors (Kim & Park, 2022). In Africa, many countries still face the problem of poor road conditions, which makes it harder for tourists to visit important sites and limits the economic benefits of tourism (Onokala & Olajide, 2020; Hassan et al., 2020).

In Tanzania, the Northern Tourism Circuit, which includes parks like Serengeti and Ngorongoro, has benefited from better road systems and attracts most visitors. On the other hand, the Southern Circuit, including Ruaha National Park, has been left behind (Smith & Jones, 2021). Data show that Ruaha receives only 0.8% of visitors compared to Ngorongoro (13.3%) and Serengeti (12.2%) (NBS, 2023). Poor road conditions increase travel time, discourage tourists, and reduce income from tourism. This also affects local communities that depend on tourists for business and jobs (World Bank, 2020). The main stakeholders affected are tourists, who face difficulties in accessing sites; local communities, who lose economic opportunities; and the government, which struggles to reach its tourism growth goals.

Because of these challenges, this study aims to examine how road quality, accessibility, and networks affect tourism growth in Tanzania, focusing on Ruaha National Park. The goal is to give practical recommendations that will improve roads, attract more tourists, and support sustainable development in the tourism sector.

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## II. LITERATURE REVIEW

### Theoretical Review

### Central Place Theory

The Central Place Theory (CPT) was first developed by Christaller (1933) and later expanded by King (1985). It explains how goods and services are spread across areas and shows how central places, such as towns, cities, or tourist hubs, serve the surrounding regions. The theory highlights that accessibility, transport networks, and travel costs are the main factors that determine how attractive and efficient these central places are (Berry & Parr, 1988). In tourism, CPT helps explain how road transport influences tourist flows. When road quality, accessibility, and networks improve, destinations such as Ruaha National Park become more attractive and tourism grows.

A key strength of CPT is its strong focus on accessibility and networks. It shows the importance of transport links in connecting central places with their surrounding areas (Christaller, 1933). This makes it especially useful in studies that look at road transport and tourism. The framework is also effective in explaining competition between destinations, such as Tanzania's well-developed northern circuit and the less accessible southern circuit (Parr, 2002). Research has also applied CPT to tourism, showing that central destinations become more appealing when they have good infrastructure (Zhou, 2019).

Despite these strengths, CPT also has weaknesses. It assumes space is uniform, which ignores real conditions like terrain, ecological limits, and political boundaries (Parr, 2002). This makes it hard to apply in places like Ruaha National Park, where the environment affects accessibility. The theory is also static, assuming stable patterns of interaction, while tourism is dynamic and shaped by changes in technology, preferences, and global trends (Neal, 2012). In addition, it focuses too much on distance and cost, while overlooking other factors such as marketing, culture, and safety (Butler, 1980).

Even with these limitations, CPT fits this study better than other theories. The Tourism Area Life Cycle model focuses on stages of destination growth but does not directly link infrastructure to tourism (Butler, 1980). Growth Pole Theory emphasizes industrial hubs as drivers of development but pays little attention to transport in tourism (Perroux, 1950). By contrast, CPT directly connects infrastructure, accessibility, and networks with destination attractiveness (Berry & Parr, 1988).

The connection between CPT and this study's variables is clear. Road quality reduces travel time and costs, making destinations more attractive (Christaller, 1933). Road accessibility shows how easily central places can be reached (Parr, 2002). Road networks highlight the importance of integration and connectivity (Berry & Parr, 1988). Finally, tourism growth is the result when accessibility and infrastructure improve, since destinations like Ruaha attract more visitors, generate more revenue, and support regional development (Zhou, 2019).

### Empirical Review

### Road quality and Tourism Growth in Tanzania

Road quality is very important for tourism growth because it affects how easy and safe it is to travel, as well as travel time. Good roads make travel more comfortable and increase the number of tourists (Hącia, 2019). In Tanzania, better roads to major sites like the Serengeti and Ngorongoro have increased both local and international visitors (Mamirkulova et al., 2020). In East Africa, tourists often decide where to go based on road conditions, and poor roads can discourage travel to remote places (Tian et al., 2022). Studies in other countries also show that road quality matters for tourism (Zhang et al., 2022; Dayoub et al., 2024), but rural areas in Tanzania, including national parks, still face problems. Research shows that improving roads helps tourism in key areas, but rural roads, such as in Ngorongoro, remain a challenge (Zhao & Min Li, 2018). Surveys with tourism operators show that road quality affects travel choices and the number of visitors (Khan & Hou, 2021). Other studies using government data and statistical analysis confirm that better roads lead to more tourism (Baloch et al., 2023). The Tanzania Rural and Urban Roads Agency (TARURA) has worked on upgrading roads to improve access to sites like Ngorongoro and Serengeti, which has increased tourism revenue (Kalvelage et al., 2021). However, rural areas still have poor roads, which limits tourism benefits for those communities (Mazrekaj, 2020).

### Road Accessibility and Tourism Growth in Tanzania

Road accessibility is very important for tourism growth because it affects how easily tourists can reach their destinations. Improved road access creates better connections between major tourist sites, encouraging more frequent visits (Xiao-Bing Feng, 2023). In Tanzania, places like the Serengeti and Ngorongoro Crater have seen increased tourist flows due to better road access, showing a positive link between accessibility and tourism growth (Salam et al., 2018). Accessibility improvements can also open remote areas to tourism, helping diversify destinations and reducing pressure on popular sites. However, regions like Mkomazi National Park and

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Mahale Mountains remain underdeveloped due to limited access (Kyara et al., 2022). Research in East Africa using surveys, interviews, and secondary data confirms that road accessibility influences tourist travel and satisfaction, and poor roads or seasonal closures can disrupt travel plans (Horng-Jinh Chang, 2012; Yusriadi et al., 2024). The availability of transport services along accessible roads is also crucial. Even if roads are improved, a lack of public or private transport can prevent tourists from reaching remote destinations, such as traveling from Dar es Salaam to distant national parks (Kholis et al., 2023; Li et al., 2024). Globally, road accessibility is recognized as a key factor in tourism growth. In India, better road connections to Himalayan sites increased tourist arrivals (Ibanescu et al., 2023), and in Kenya, road improvements to Maasai Mara and Amboseli National Parks boosted visitor numbers, especially from international markets (Buchari et al., 2024).

**Road Networks and Tourism Growth in Tanzania**

Road networks are important for moving tourists between cities, attractions, and transport hubs. Efficient networks make travel easier, increase accessibility, and improve the appeal of tourist destinations, especially for areas that were previously hard to reach (Băndoi et al., 2020). In Tanzania, improvements in roads leading to national parks have enhanced tourist access (TANROADS, 2019). Road networks also help tourists move smoothly between multiple attractions, which improves their overall travel experience (Tan & Ismail, 2020). While the role of road networks in tourism growth is well recognized, there is limited research on how regional networks help diversify tourism within a country (Sotiriadis & Shiwei Shen, 2017). Most studies, such as Huang et al. (2022), focus on connections between cities and major parks but pay less attention to intra-regional networks. Constructing new roads alone does not guarantee tourism growth if they are not maintained properly (Chen et al., 2021). Well-developed road networks not only increase visitor numbers but also help spread tourism benefits more evenly across the country. Improvements in road networks can create jobs and business opportunities for local communities in peripheral areas (Ivankova et al., 2021).

**Conceptual Framework**

The conceptual framework for this study shows the relationship between the independent and dependent variables in examining how road transport infrastructure affects tourism growth in Ruaha National Park. The independent variables are road quality, road accessibility, and road networks, which are key factors influencing the efficiency and effectiveness of travel to the park. Road quality refers to the condition, maintenance, and durability of roads; road accessibility is the ease with which tourists can reach the park; and road networks describe how well roads connect with other transportation routes, allowing smoother travel. The dependent variable is tourism growth, measured through indicators such as the number of visitors, length of stay, and overall revenue generated from the park.

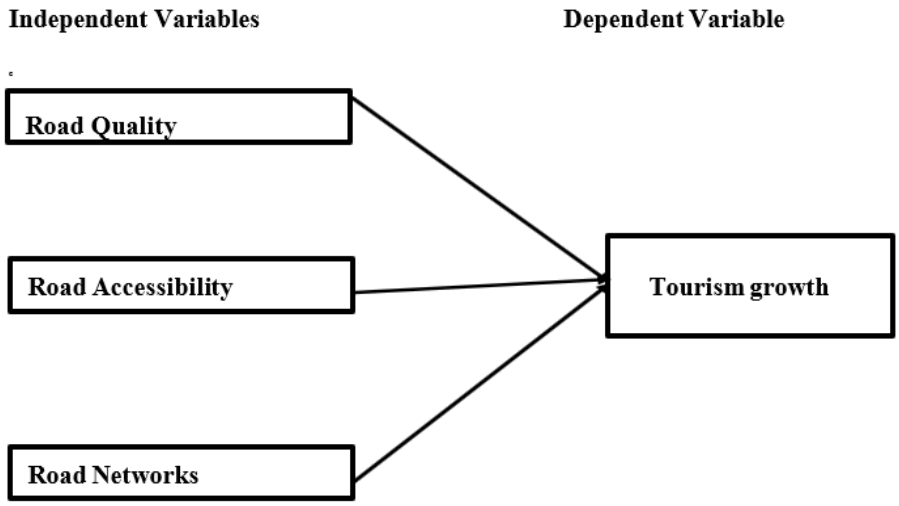


Figure 1: Conceptual framework
Source: Modified from (Kalvelage et al., 2021) and (Mamirkulova et al., 2020)

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## III.METHOD

This study was guided by a positivism research philosophy, which emphasizes objective measurement, observable phenomena, and statistical analysis. This approach ensured reliability and validity through the use of structured surveys and quantitative data to examine the impact of road quality, accessibility, and road networks on tourism growth. A deductive research approach was applied, focusing on testing theories and concepts from the literature using numerical data. This combination enabled the study to systematically assess the influence of road transport infrastructure on tourism in Ruaha National Park and generate empirical evidence for decision-making in infrastructure planning (Yin, 2003; Creswell, 2009).

A quantitative research design was employed to investigate the role of road transport infrastructure in enhancing tourism. This design allowed detailed assessment of the current conditions of roads and their effects on tourism growth. The study was conducted at Ruaha National Park, located in southern Tanzania, which is accessible primarily by road and attracts both local and international tourists. Focusing on this park provided practical insights into the relationship between road infrastructure and tourism, ensuring alignment with the research problem (Louis et al., 2007).

The population consisted of 2,978 registered tour operator companies in Tanzania, selected because they are directly affected by road infrastructure and facilitate tourist access to the park (TANAPA, 2024). Using Yamane's formula (1967) and a 5% margin of error, a sample of 353 operators was chosen. Simple random sampling ensured each operator had an equal chance of selection, producing an unbiased and representative sample. Out of 353 questionnaires, 313 were returned, giving an 88.7% response rate, which strengthened the reliability of the findings (Creswell, 2009; Dunn, 2009).

Data were collected using structured questionnaires and supplemented with secondary sources, including government reports and research articles, to provide historical context and validate primary data. Quantitative data were cleaned, coded, and analyzed using SPSS, with descriptive statistics summarizing key variables and inferential statistics, such as correlation and regression, examining relationships between road infrastructure and tourism growth. Pilot testing ensured validity, while reliability was confirmed using Cronbach's Alpha. Ethical considerations were strictly followed, including informed consent, confidentiality, the right to withdraw, and approvals from relevant authorities (Singh, 2006; Kumar, 2011).

## IV. RESULT AND DISCUSSION

### Results

### Road quality and Tourism Growth in Tanzania

The findings indicate that poor road conditions significantly affect tourism operations at Ruaha National Park. Respondents reported frequent vehicle breakdowns due to potholes, with a mean of 1.55 and a standard deviation of 0.678, highlighting recurring mechanical issues and travel delays. Regular road maintenance was perceived to improve travel comfort, with a mean of 1.74 and a standard deviation of 0.866, indicating strong agreement among tour operators. Experiences of road-related incidents, such as accidents or obstructions, recorded a mean of 1.72 and a standard deviation of 0.943, emphasizing road safety as a major concern. Vehicle damage due to road conditions had a mean of 1.67 and a standard deviation of 1.159, reflecting some variation in experiences. Overall, the results demonstrate that road quality strongly influences operational costs, safety, and tourist satisfaction, underscoring the need for targeted investments in road improvement and regular maintenance to enhance accessibility and support sustainable tourism at Ruaha National Park.

Table 1: Perceptions on Road Quality and Its Impact on Tourism Travel

| Statements | Mean | Standard Deviation |
|---|---|---|
| Presence of potholes increases breakdowns on the way to the park. | 1.55 | 0.678 |
| Regular maintenance of roads increases travel comfortability for tourists visiting the park. | 1.74 | 0.866 |
| Have you been involved or witnessed any incidents due to poor road quality on the route to the park? | 1.72 | 0.943 |
| Have you experienced any vehicle damage attributed to road conditions on your way to Ruaha National Park? | 1.67 | 1.159 |

**Source**: Field Data (2025)

1.00 – 1.79 = Strongly Disagree, 1.80 – 2.59 = Disagree, 2.60 – 3.39 = Neutral, 3.40 – 4.19 = Agree, 4.20 – 5.00 = Strongly Agree

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**Road Accessibility and Tourism Growth in Tanzania**

The findings indicate that tour operators face notable access challenges to Ruaha National Park, particularly during certain seasons, with a mean of 1.66 and a standard deviation of 0.880, suggesting that factors such as flooding, poor drainage, or road blockages limit accessibility and may cause delays or cancellations, affecting tourist satisfaction. Improved road transport services were recognized as enhancing tourist numbers, reflected by a mean of 1.88 and a standard deviation of 0.854, highlighting the importance of car hire, shuttle services, and public transport in facilitating tourist movement. The presence of alternative routes also received strong agreement, with a mean of 1.73 and a standard deviation of 0.795, indicating that multiple routes provide flexibility, reduce travel time, and improve reliability for tour operators. However, responses to the ease of accessing the park using primary transportation modes were mixed, with a higher mean of 3.54 and a standard deviation of 1.130, reflecting differences in vehicle type, operator location, and road familiarity. Overall, the results show that while transport services and alternative routes improve accessibility, seasonal disruptions and vehicle limitations continue to challenge consistent tourist access. These findings underscore the need for targeted investments in road infrastructure, seasonal maintenance, and improved signage to enhance year-round accessibility and support sustainable tourism at Ruaha National Park.

Table 2: Perceptions on Road Accessibility and Its Impact on Tourism Travel

| Statements | Mean | Standard Deviation |
|---|---|---|
| Do you face any difficulties in terms of road access during certain times to Ruaha National Park? | 1.66 | 0.880 |
| The availability of road transport services has led to an increased number of tourists visiting Ruaha National Park. | 1.88 | 0.854 |
| The presence of alternative routes has improved access to Ruaha National Park. | 1.73 | 0.795 |
| It is easy for you to access Ruaha National Park using your primary mode of transportation. | 3.54 | 1.130 |

**Source**: Field data (2025)

1.00 – 1.79 = Strongly Disagree, 1.80 – 2.59 = Disagree, 2.60 – 3.39 = Neutral, 3.40 – 4.19 = Agree, 4.20 – 5.00 = Strongly Agree

**Road Networks and Tourism Growth in Tanzania**

The findings on road networks to Ruaha National Park reveal mixed perceptions among tour operators. The availability of multiple routes received a mean of 2.49 and a standard deviation of 1.509, indicating a relatively neutral response with high variability, suggesting that some operators recognize alternative routes while others find options limited. The statement regarding the ease of locating road networks recorded a mean of 2.01 and a standard deviation of 0.599, reflecting general agreement that routes to the park are fairly visible and accessible. However, the integration of park access roads with major highways yielded a higher mean of 3.20 and a standard deviation of 1.129, suggesting moderate disagreement or uncertainty, and highlighting perceived deficiencies in connectivity that may increase travel times or complicate route planning. Additionally, the perception that improved road networks have increased tourist arrivals received a mean of 2.93 and a standard deviation of 1.004, indicating moderate agreement and suggesting that while road improvements contribute to tourism growth, other factors such as marketing or accommodation expansion may also play a role. Overall, the results indicate that although road networks to the park are generally visible and accessible, there are concerns regarding route integration and sufficiency. Enhancing network planning, better connecting park roads with national highways, and providing clearer signage could improve accessibility and support sustainable tourism growth at Ruaha National Park.

Table 3: Perceptions on Road Networks and Its Impact on Tourism Growth

| Statements | Mean | Standard Deviation |
|---|---|---|
| Are there multiple routes available for you to reach Ruaha National Park? | 2.49 | 1.509 |
| It is accessible to find road networks that lead to the park. | 2.01 | 0.599 |
| Are the roads to the park well integrated with other major routes (e.g., highways, main roads)? | 3.20 | 1.129 |

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| | | |
|---|---|---|
| Improved road networks have increased the number of tourist arrivals at Ruaha National Park. | 2.93 | 1.004 |

**Source:** Field Data (2025)

**Model summary**

The regression results show a weak but positive relationship between road infrastructure and tourism growth at Ruaha National Park (R = 0.180). The $R^2$ value of 0.032 indicates that only 3.2% of the variation in tourism growth can be explained by road quality, road accessibility, and road networks together, while the Adjusted $R^2$ of 0.023 provides a more accurate estimate for the general population. Road quality affects tourism by improving travel safety, comfort, and vehicle reliability, making it easier for tourists to visit the park. Road accessibility influences how easily tourists can reach the park, reduce delays and enhance the visitor experience. Road networks support tourism by connecting the park to major routes, allowing smoother travel and better integration with other destinations. The Standard Error of the Estimate of 0.45057 shows the average difference between the predicted and actual tourism growth values. The model is statistically significant (F = 3.443, p = 0.017), indicating that although these factors explain a small part of the variation in tourism growth, road quality, accessibility, and networks collectively have a meaningful impact on tourism development at Ruaha National Park.

Table 4: Model summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .180[a] | .032 | .023 | .45057 | .032 | 3.443 | 3 | 309 | .017 |
| a. Predictors: (Constant), road networks, Road Quality, Road Accessibility | | | | | | | | | |
| b. Dependent Variable: Tourism Growth | | | | | | | | | |

Source: Field Data (2025)

**Analysis of variance (ANOVA)**

The regression sum of squares is 2.097, while the residual sum of squares is 62.732, leading to a total sum of squares of 64.829. The model yields an F-statistic of 3.443 with a significance level of 0.017, indicating that the regression model is statistically significant at the 5% level ($p < 0.05$). This suggests that the combination of the three road transport infrastructure factors collectively has a meaningful impact on tourism growth. The degrees of freedom (df) are 3 for regression (corresponding to the three predictors) and 309 for residuals (based on the sample size), totaling 312. The mean square for regression is 0.699, while that for the residual is 0.203, highlighting that the model explains more variation than would be expected by chance. Therefore, the ANOVA results provide sufficient evidence that road infrastructure significantly contributes to the observed variations in tourism growth in the study area.

Table 5: Analysis of variance (ANOVA)

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 2.097 | 3 | .699 | 3.443 | .017[b] |
| | Residual | 62.732 | 309 | .203 | | |
| | Total | 64.829 | 312 | | | |
| a. Dependent Variable: Tourism Growth | | | | | | |
| b. Predictors: (Constant), road networks, Road Quality, Road Accessibility | | | | | | |

**Source:** Field Data (2025)

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**Regression Coefficients**

The analysis shows that road quality positively and significantly influences tourism growth at Ruaha National Park (B = 0.122, β = 0.126, p = 0.025), indicating that improvements in road conditions, signage, or maintenance moderately enhance tourist satisfaction and access. Road accessibility, however, has a negative but non-significant effect (B = -0.025, β = -0.025, p = 0.653), suggesting that ease of reaching the park does not meaningfully impact tourism growth in this context. Road networks exhibit a negative and significant effect (B = -0.098, β = -0.126, p = 0.025), implying that poorly planned or congested networks may deter tourists or redirect traffic to other destinations. Overall, the findings indicate that enhancing road quality should be the priority for tourism development, while road networks require careful planning, and accessibility alone is not a significant driver of growth.

Table 6: Coefficients

| **Model** | | **Unstandardized Coefficients** | | **Standardized Coefficients** | **t** | **Sig.** |
|---|---|---|---|---|---|---|
| | | **B** | **Std. Error** | **Beta** | | |
| 1 | (Constant) | 1.683 | .195 | | 8.635 | .000 |
| | Road Quality | .122 | .054 | .126 | 2.249 | .025 |
| | Road Accessibility | -.025 | .056 | -.025 | -.450 | .653 |
| | road networks | -.098 | .044 | -.126 | -2.250 | .025 |
| a. Dependent Variable: Tourism Growth | | | | | | |

Source: Field Data (2025)

**Discussions**

**The Influence of Road Quality on Tourism Growth**

The study demonstrates that road quality is a significant determinant of tourism growth at Ruaha National Park. Descriptive findings show moderate perceptions of road conditions, with statements such as “The road is free from potholes and cracks” and “The road surface allows for smooth travel” receiving mean scores of 3.23 and 3.41, indicating mixed experiences among tourists and service providers due to factors such as rough surfaces, dust, and seasonal inaccessibility. Inferential analysis confirms that road quality positively and significantly influences tourism growth, with a beta coefficient (β) of 0.122 and a p-value of 0.025, suggesting that improvements in road condition and maintenance enhance visitor numbers, length of stay, and overall satisfaction. Theoretically, these findings align with Central Place Theory (CPT), which emphasizes that accessibility and transport networks to central places, such as tourist destinations, increase visitation; well-maintained roads reduce travel costs and psychological barriers, enhancing destination competitiveness. Empirical evidence from regional studies supports this conclusion, including Nyamweya and Kihoro (2019), who found road quality directly affects tourist satisfaction and local business development, and Mutinda and Mayaka (2021), which linked improved infrastructure in Kenyan national parks to higher tourist arrivals, particularly domestic travelers. Therefore, despite moderate perceptions among stakeholders, the study underscores that enhancing road surface, durability, and maintenance especially during rainy seasons can significantly strengthen Ruaha National Park’s accessibility, attractiveness, and contribution to tourism growth, reinforcing both theoretical predictions and regional empirical evidence.

**The Influence of Road Accessibility on Tourism Growth**

Descriptive statistics revealed mixed perceptions, with a mean score of 3.54 for the statement “It is easy for you to access Ruaha National Park using your primary mode of transportation,” indicating moderate agreement, while the statement “Do you face any difficulties in terms of road access during certain times?” scored much lower (mean = 1.66), highlighting seasonal or temporal barriers that affect travel ease. Despite its conceptual importance, inferential analysis indicated that road accessibility had a negative but statistically insignificant effect on tourism growth (β = -0.025, p = 0.653), suggesting that perceived variations in accessibility do not meaningfully predict changes in tourism activity. This may be due to tourists and operators relying on alternative entry points or modes of transport, or because access challenges are often seasonal rather than persistent, reducing their overall impact. Theoretically, this result nuances Central Place Theory (CPT), which emphasizes accessibility as central to attracting visitors; in the case of Ruaha, accessibility limitations may be

offset by alternative routes or transport options, while other factors, such as road quality and networks, exert stronger influence on tourism growth. Supporting literature aligns with these findings, as studies by Msuya et al. (2018) and Temu and Mutakyahwa (2020) show that accessibility in remote areas interacts with other infrastructure and service-related factors, and that tourists often adapt through seasonal planning or specialized transport. Therefore, while road accessibility remains important, its direct influence on tourism growth at Ruaha is limited, indicating that strategies should integrate improvements in road quality, networks, and multimodal transport to fully enhance tourism development.

### The Influence of Road Networks on Tourism Growth

Descriptive results in this study indicated moderate perceptions of networks, with a mean score of 3.20 for the statement "Are the roads to the park well integrated with other major routes (e.g., highways, main roads)?" suggesting that while some respondents find the networks adequate, others perceive them as lacking. Regression analysis, however, revealed that road networks had a negative and statistically significant effect on tourism growth, with a beta coefficient of -0.098 and a p-value of 0.025, indicating that increased networks, as perceived by respondents, are associated with a slight decrease in tourism growth at Ruaha National Park. This may be due to insufficient quality, capacity, or efficiency of the road linkages, leading to congestion, travel delays, or safety concerns, or because certain network routes divert traffic away from Ruaha to competing destinations, reducing the park's relative appeal. According to Central Place Theory (CPT), well-planned networks should enhance accessibility and support the growth of central places, yet inefficient or poorly integrated networks can fail to achieve these benefits and even create unintended consequences such as environmental stress or uneven tourist distribution. Supporting studies reinforce this interpretation: Banda and Mutua (2020) found that East African parks connected to urban centers often experience network bottlenecks or deteriorating infrastructure, while Kimani and Wambua (2019) observed that inadequate maintenance and planning can reduce the positive impacts of networks on tourism flows. These findings highlight that effective road networks require not only physical connections but also adequate quality, capacity, and alignment with travel patterns to positively influence tourism growth.

## VI. Conclusions

The study concludes that road transport infrastructure significantly influences tourism growth at Ruaha National Park, with road quality emerging as the most critical factor, as well-maintained and safe roads enhance tourist visits and travel experiences. Road accessibility, although conceptually important, showed no significant effect on tourism growth, suggesting that alternative transport modes, seasonal conditions, or multiple access routes may mitigate accessibility limitations. Conversely, road networks exhibited a negative impact, highlighting challenges in planning, traffic management, and route competition, emphasizing that poorly designed or managed networks can hinder tourism flows. Overall, the findings underscore the need for integrated transport infrastructure development that prioritizes road quality, strategic networks, and complementary services to sustain and grow tourism. Recommendations include increased government investment in road upgrades, collaboration between TANAPA and transport agencies for maintenance and awareness, tour operator investment in suitable vehicles and coordinated services, and active participation from local communities and private stakeholders in monitoring and supporting sustainable infrastructure. Future research should compare northern and southern Tanzanian national parks to examine regional differences in road infrastructure and tourism growth, offering insights for balanced national tourism development.

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