

**LINKING INFRASTRUCTURE TO LIVELIHOODS: ASSESSING THE INFLUENCE OF
INFRASTRUCTURE DEVELOPMENT ON SOCIO-ECONOMIC SECURITY IN TAITA TAVETA
COUNTY, KENYA**

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ABSTRACT

This study investigated the influence of mega infrastructural development projects on socio-economic security in Taita Taveta County, Kenya, with a focus on road, rail, and housing sectors. Employing a descriptive cross-sectional design, the research combined quantitative and qualitative methods to collect data from 414 respondents across Voi, Taveta, Mwatate, and Wundanyi sub-counties. The findings reveal that road and housing infrastructure have had a positive and statistically significant impact on socio-economic security by enhancing access to essential services, creating employment opportunities, and improving overall household welfare. In contrast, the Standard Gauge Railway (SGR) project exhibited limited socio-economic benefits due to weak integration with local economic systems and minimal community engagement during planning and implementation. The study concludes that while infrastructure is a key enabler of development, its socio-economic impact depends on equitable distribution, functionality, and local relevance. It recommends that future projects be guided by inclusive planning, targeted outreach to underserved areas, and alignment with local livelihoods to ensure sustainable and inclusive socio-economic gains.

Keywords: Infrastructure development, Socio-economic security, Mega projects, Taita Taveta County, Kenya

INTRODUCTION

Infrastructure serves as the backbone of economic transformation and social development, enabling access to essential services, markets, and opportunities. Achieving sustainable development therefore requires a balanced approach that not only promotes economic growth but also ensures equitable distribution of resources and opportunities across all socio-economic groups (Foster et al., 2023). Within this framework, economic and social security emerge as fundamental components that guarantee individuals and communities stable income sources and essential services. Economic security entails access to employment, adequate income, and critical resources, thereby enhancing resilience to economic shocks (Karpenko et al., 2021), while social security encompasses welfare programs, healthcare, and education services that reduce vulnerabilities and promote social inclusion (Ivanov, 2019). The synergy between these dimensions is essential in addressing inequality and ensuring that economic progress translates into improved living standards across the population (Oyelana et al., 2022).

Socio-economic security, therefore, represents a comprehensive framework that integrates both economic and social elements to promote development, equity, and stability. It involves the assurance of sustainable livelihoods, accessible quality services, and institutional mechanisms capable of mitigating socio-economic risks (Foster et al., 2023). Investments in socio-economic security contribute significantly to poverty reduction, human capital enhancement, and increased productivity, thus driving long-term and inclusive development outcomes (Zvorych & Zvorych, 2021).

Emerging scholarly literature has expanded the discourse on socio-economic security by examining its multidimensional nature and real-world impacts. For example, Darin-Mattsson et al. (2017) analyzed how various indicators of socio-economic status influence health outcomes in older age, underscoring the importance of integrated measures to address long-standing disparities. Similarly, Walker et al. (2023) explored the intersection between food insecurity, neighborhood food environments, and health inequalities, revealing that poor access to nutritious, affordable food significantly affects vulnerable communities—particularly those from disadvantaged socio-economic and ethnic backgrounds.

At the global level, socio-economic security is increasingly recognized as a policy priority by institutions such as the United Nations and the World Bank, which advocate for inclusive development frameworks. Human Development Index (HDI) data highlights stark disparities, with high-income countries scoring above 0.850 while low-income nations remain below 0.550 (UNDP, 2023). A key determinant of these disparities is infrastructural development. In developed economies, robust transport, energy, and communication networks underpin access to opportunity and welfare (World Bank, 2022), while infrastructural deficits in low- and middle-income countries contribute to persistent deprivation, with over 1 billion people lacking access to safe water and reliable electricity (International Energy Agency, 2021).

In Sub-Saharan Africa, socio-economic insecurity remains widespread, marked by high unemployment, income inequality, and limited access to essential services. The region's average HDI stood at 0.547 in 2022, reflecting deep-rooted vulnerabilities (UNDP, 2023). Although urban centers in the region have witnessed moderate infrastructural progress, rural areas remain largely underserved. According to the African Development Bank (AfDB), only 40% of the population in Sub-Saharan Africa has access to electricity, and a mere 25% of the road network is paved (AfDB, 2021; 2024). Initiatives such as the LAPSSSET Corridor and the Grand Ethiopian Renaissance Dam (GERD) aim to address these gaps, but progress is hampered by financial, logistical, and governance challenges.

Kenya, as a leading economy in East Africa, has undertaken significant infrastructural investments under its Vision 2030 agenda to enhance socio-economic security. The country's HDI rose to 0.601 in 2022, driven by improvements in education, health, and income levels (KNBS, 2023). Major projects such as the Standard Gauge Railway (SGR), the Nairobi Expressway, and last-mile electrification programs have supported growth and expanded access to services. However, despite these efforts, socio-economic disparities persist,

particularly in rural areas where poverty remains high and access to essential amenities is limited. The "Big Four Agenda," which included universal healthcare and affordable housing, sought to reduce these disparities, yet structural challenges in delivery and distribution persist (KNBS, 2023).

While infrastructural development remains critical to Kenya's socio-economic aspirations, uneven access, quality, and sustainability of projects have limited their transformative potential. In counties like Taita Taveta, significant infrastructure investments under Vision 2030 have not translated into uniformly improved livelihoods. Part of the SGR passes through the County accounting for over 30% of its total length in Kenya (Kenya Railways Corporation, 2022). However, persistent issues such as youth unemployment, poor access to healthcare and education, and income instability especially in rural sub-counties undermine the goals of inclusive development (KNBS, 2023). Additionally, concerns over land displacement, environmental degradation, and limited community involvement in project planning have raised questions about the long-term sustainability and equity of mega projects (Taita Taveta CIDP, 2023–2027).

Although transport and housing infrastructure have contributed to some positive development outcomes, communities in Taita Taveta continue to face challenges related to service affordability, infrastructure reach, and institutional capacity. The absence of a well-defined policy framework for inclusive infrastructure planning exacerbates regional inequalities and weakens the long-term developmental impact of these investments (AfDB, 2022). Conceptually, most existing studies emphasize macro-level indicators such as GDP or employment rates, often overlooking critical elements of socio-economic security such as equitable access, social cohesion, and community-level welfare (World Bank, 2021; Foster & Briceno-Garmendia, 2022). Contextually, research has often focused on urbanized or national-level dynamics, neglecting the nuanced experiences of rural counties like Taita Taveta, which have distinct infrastructural and socio-economic characteristics (Kimani & Mwangi, 2021; Njoroge et al., 2023). Methodologically, prior studies have leaned on secondary data or high-level case studies, lacking localized empirical insights into how mega infrastructural projects affect household and community-level socio-economic outcomes (Ouma & Achieng, 2019; Mburu & Karanja, 2022). This study therefore addresses these conceptual, contextual, and methodological gaps by providing a focused empirical analysis of how mega infrastructure projects specifically in rail, road, and housing have influenced socio-economic security in Taita Taveta County. Through mixed methods, the research aims to unpack the complex relationship between physical infrastructure and human welfare at the local level, offering insights for inclusive infrastructure policy and planning.

LITERATURE REVIEW

Existing literature on infrastructural development has largely concentrated on its contributions to economic growth, trade facilitation, and business expansion, often overlooking the broader implications for socio-economic security. Theoretical frameworks such as Growth Pole Theory and Infrastructure-Led Development (Perroux, 1955; Calderón & Servén, 2010) underscore infrastructure's role in economic transformation but fall short of comprehensively addressing its effects on livelihood stability, social welfare, and equitable access to opportunities. Research on housing infrastructure, for instance, tends to focus on urbanization and affordability, with limited exploration of how large-scale housing projects influence long-term socio-economic stability, especially in rural and peri-urban settings (Wang, Wu, & Choguill, 2021). Umana et al. (2024) evaluated government policies promoting social housing in developing countries but emphasized policy design and efficiency more than their localized socio-economic impacts. Similarly, Windapo et al. (2021) examined the use of sustainable technologies in low-income housing but did not assess their influence on income distribution or social resilience. This study addresses that conceptual gap by examining mega projects in rail, road, and housing not only as catalysts for economic activity but also as determinants of socio-economic security through their effects on employment, income stability, and access to basic services.

Infrastructural development research has been extensively conducted in urban contexts and developed economies, yet there is a dearth of evidence on its impact in semi-urban and rural regions such as Taita Taveta County. The unique structural and governance challenges in these areas—ranging from unequal resource allocation to inadequate institutional support—require context-specific analysis (Muvawala, Sebukeera, & Ssebulime, 2021). Studies from countries like China, South Africa, and Nigeria have explored infrastructure’s contribution to national economic development, but their findings are not always transferable to Kenya’s localized realities (Lesutis, 2022; Khanani et al., 2021). While the Standard Gauge Railway (SGR), road expansion projects, and affordable housing programs have featured prominently in Kenya’s national development discourse, there remains limited empirical assessment of their outcomes at the county level—particularly in less urbanized areas like Taita Taveta (Limakamar, 2017). Additionally, while scholars like Hromádka et al. (2020) have analyzed the socio-economic benefits of railway projects, their focus on European contexts renders their insights less applicable to Kenya’s infrastructural and institutional landscape. Plotnikov et al. (2019) similarly examined transport infrastructure and economic security in Russia but did not account for the policy and governance constraints typical in African settings. This study thus contributes to bridging the contextual gap by assessing how mega infrastructure projects influence socio-economic outcomes in a semi-urban Kenyan county.

A methodological limitation common to much of the prior research is the reliance on macro-level statistical models, qualitative overviews, or secondary data, often emphasizing national economic indicators while neglecting community-level socio-economic outcomes (Pamucar et al., 2022). Though such studies offer broad policy insights, they frequently fail to capture micro-level dynamics such as household welfare, employment variability, and access to critical services. Few studies have utilized mixed-methods approaches to understand infrastructure's impact from both a quantitative and qualitative perspective (Bai & Weng, 2023). Moreover, generic economic growth models may overlook nuanced aspects of socio-economic security such as income volatility, service inequality, and social cohesion (Kiai, 2020; Muriithi & Mwenda, 2021). To fill this methodological gap, the current study adopts an integrated approach, combining structured household surveys, key informant interviews, and document analysis. This enables a more comprehensive and evidence-based assessment of how mega infrastructural investments shape socio-economic security in Taita Taveta County.

The conceptual framework provides a structured depiction of the connection between infrastructural development and socio-economic security. It serves as a guiding model that illustrates how different types of infrastructure investments (mega rail, road, and housing projects) contribute to socio-economic security by influencing key economic and social indicators such as employment, income levels, business growth, and access to essential services.

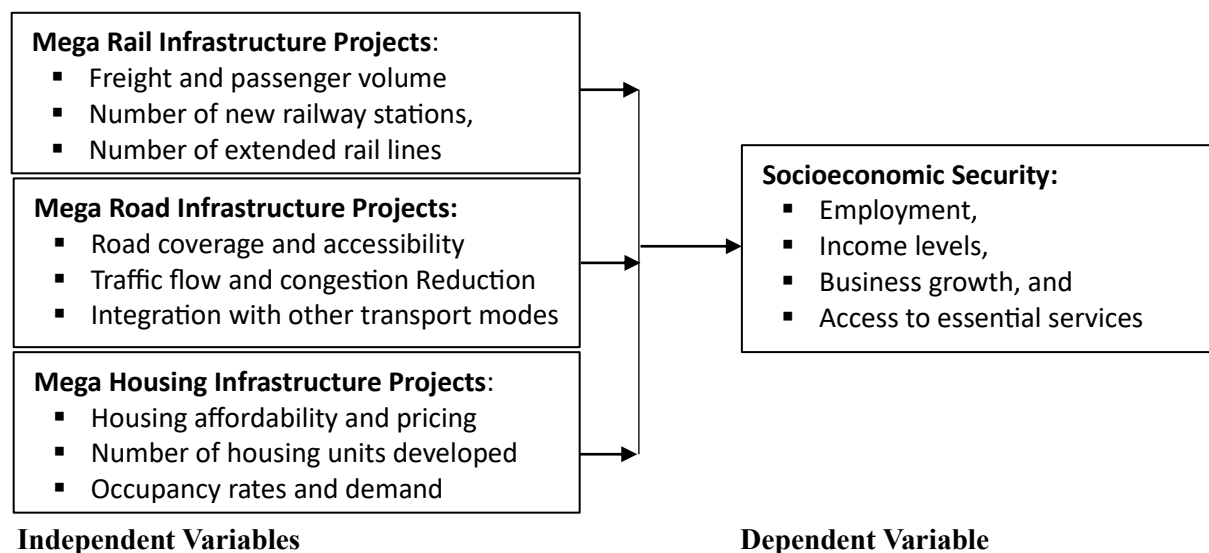


Figure 1: Conceptual Framework

METHODOLOGY

This study adopted a descriptive cross-sectional research design to examine the influence of mega infrastructural development on socio-economic security in Taita Taveta County. Data were collected from Voi, Taveta, Mwatate, and Wundanyi sub-counties, which reflect a blend of urban, peri-urban, and rural contexts. The target population consisted of 372,000 community members affected by infrastructure projects, from which a representative sample of 400 was drawn using Yamane's (1967) formula at a 95% confidence level. Stratified random sampling ensured proportional representation across sub-counties, while purposive sampling was used to select 14 key stakeholders, including government officials, engineers, business owners, and representatives from NGOs and infrastructure agencies.

Multiple instruments were employed for data collection. Structured questionnaires provided quantitative data on household demographics, infrastructure access, and socio-economic indicators. Qualitative data were gathered through key informant interviews (KIIs), four focus group discussions (FGDs), and direct field observations. Secondary data from government agencies and project reports were used to support primary findings. All tools were reviewed and pre-tested for validity and reliability. The questionnaire was also subjected to test-retest reliability checks (Kothari, 2014).

Quantitative data were analyzed using SPSS, applying descriptive statistics and multiple regression analysis to evaluate the relationship between infrastructure types (rail, road, housing) and socio-economic security. The regression model used was:

$$SES = \beta_0 + \beta_1(\text{Rail}) + \beta_2(\text{Road}) + \beta_3(\text{Housing}) + \epsilon,$$

Where SES represents socio-economic security, and β coefficients represent the influence of each infrastructure variable.

Qualitative data were thematically analyzed to identify patterns and stakeholder perceptions, with triangulation used to reinforce the credibility of findings. Ethical approvals were obtained from NACOSTI and the County Government, and all participants gave informed consent. Confidentiality, cultural sensitivity, and research integrity were maintained throughout the process.

FINDINGS

This section presents the results of a multiple linear regression analysis conducted to assess the influence of mega infrastructural development projects on socio-economic security in Taita Taveta County. The analysis focused on three key predictors (mega rail, road, and housing infrastructure) and their respective contributions to improving the county's socio-economic conditions. The results provide empirical insights into how each infrastructure component affects local livelihoods, stability, and access to essential services.

The multiple linear regression analysis was conducted to determine the influence of mega infrastructural development projects on socio-economic security in Taita Taveta County. The findings reveal that the overall model was statistically significant, with an F-statistic of 390.17 and a p-value of 0.000, indicating that the independent variables jointly explained a significant portion of the variation in socio-economic security. The R-squared value of 0.7472 suggests that approximately 74.7% of the variation in socio-economic security in the county is accounted for by the three predictors (mega rail infrastructure, road infrastructure, and housing infrastructure projects). The adjusted R-squared of 0.7453 further confirms the model's goodness-of-fit.

Table 1: Regression Analysis Results

Source	SS	df	MS	Number of obs	=	400
Model	175.435591	3	58.4785304	F(3, 396)	=	390.17
Residual	59.3523087	396	.149879567	Prob > F	=	0.0000
Total	234.7879	399	.588440852	R-squared	=	0.7472
				Adj R-squared	=	0.7453
				Root MSE	=	.38714

SES	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
Rail	.0223487	.0461966	0.48	0.629	-.0684725 .1131699
Road	.2929496	.0559493	5.24	0.000	.1829547 .4029445
Housing	.5584096	.0497869	11.22	0.000	.4605299 .6562893
_cons	.5499463	.1067754	5.15	0.000	.3400287 .7598639

An examination of the individual coefficients shows varied impacts of the infrastructural components on socio-economic security. Mega road infrastructure projects had a positive and statistically significant effect on socio-economic security, with a regression coefficient (β) of 0.2929 and a p-value of 0.000. This finding suggests that improvements in road infrastructure, such as expansion, quality enhancement, and maintenance, significantly contribute to better socio-economic outcomes, including increased access to markets, services, and job opportunities. Similarly, mega housing infrastructure projects demonstrated a strong positive influence on socio-economic security. The regression coefficient (β) was 0.5584, and the p-value was 0.000, indicating that housing developments, particularly those aimed at affordability and reducing informal settlements, play a critical role in enhancing the living conditions, social stability, and economic resilience of communities within Taita Taveta County.

On the other hand, mega rail infrastructure projects did not exhibit a statistically significant effect on socio-economic security. The regression coefficient was 0.0223, with a p-value of 0.629, implying that, despite improvements in mobility and connectivity associated with the rail, its direct contribution to socio-economic security remains limited. This suggests that while the SGR has enhanced accessibility and mobility, its direct contribution to improving socio-economic security indicators such as employment, income levels, and access to essential services is not statistically significant. This finding aligns with the study by Lesutis (2022), which highlighted the uneven socio-economic impact of the SGR in Kenya, benefitting urban middle classes while marginalizing peri-urban and rural populations. This could be attributed to factors such as the temporary nature of employment opportunities during construction and limited integration of the rail services with local economic activities.

This result confirms the Theory of Infrastructure-Led Development (Calderón & Servén, 2010), which posits that transportation infrastructure reduces transaction costs and increases economic productivity. These findings are consistent with Plotnikov *et al.* (2019), who demonstrated that transport infrastructure is critical for regional economic security by facilitating investment and urban growth. In Taita Taveta, improved road networks have expanded mobility, thereby fostered regional trade and facilitated access to essential services. The significant positive effect highlights the role of roads in enabling connectivity for rural populations, a gap noted by Khanani *et al.* (2021) in peri-urban areas.

These quantitative findings are further reinforced by qualitative evidence gathered from KIIs and FGDs conducted in Taita Taveta County. The perspectives shared by local traders, farmers, transport operators, and

community leaders highlight the critical role that mega road network infrastructure projects have played in enhancing socio-economic security. Participants consistently acknowledged that improved road infrastructure has facilitated better access to markets, healthcare, and education services, while also creating employment opportunities and stimulating regional trade. The following excerpts from the qualitative data provide concrete examples that substantiate the observed positive and significant effect of road networks on socio-economic outcomes in the county.

“The roads have helped us reach markets faster, but transport costs are still high.”
(Participant, FGD Voi Sub-County)

This statement highlights the importance of road networks in improving access to markets, even though transport costs remain an issue in some areas. The enhanced speed and efficiency of market access contribute directly to local economic activity and household incomes.

“Improved infrastructure has reduced transport costs and increased access to essential services.” (Business Owner, KII-3)

This comment underscores the multi-dimensional socio-economic benefits of road infrastructure development. It points to reduced barriers to healthcare and education, in line with the Theory of Infrastructure-Led Development, which emphasizes the role of infrastructure in reducing access costs.

“The government should fix rural roads so businesses can grow.” (Participant, FGD Mwatate Sub-County)

This perspective reflects the community’s recognition that rural road networks are essential for local businesses to thrive. The statement reinforces the need to extend the road network's benefits beyond major trade corridors to more remote areas.

“The main roads are better, but feeder roads to villages are in a terrible state, making transportation costly.” (Participant, FGD Wundanyi Sub-County)

This highlights the progress made in road development on major routes but also signals existing disparities in rural connectivity. It demonstrates that while road networks significantly enhance socio-economic security, there are still critical gaps that need addressing to achieve inclusive regional development. Sustainable development theory supports these findings by emphasizing that road projects enhance social inclusion and economic resilience when they are equitably planned and executed. The positive and significant influence observed in Taita Taveta demonstrates that investment in road infrastructure can yield inclusive socio-economic benefits, reinforcing the arguments by Muvawala *et al.* (2021) regarding the long-term economic growth effects of road infrastructure. Furthermore, the resource-based theory (Barney, 1991) suggests that road infrastructure can be a strategic asset contributing to competitive regional advantage. Taita Taveta's road network has likely improved the county’s economic attractiveness by enabling resource mobilization and market access, reinforcing its role as an enabler of regional development and socio-economic security.

Housing developments have contributed meaningfully to improved living standards, enhanced social stability, and increased home ownership rates, thereby promoting socio-economic security. These results support Sustainable Development Theory (Brundtland, 1987), which advocates for inclusive and sustainable urban development as a pathway to socio-economic stability. This finding aligns with Wang *et al.* (2021), who established that public housing projects can promote social integration and economic inclusivity. In Taita Taveta County, affordable housing will reduce informal settlements and improved living conditions, created employment opportunities and stimulated local economic activity. The positive and significant impact also resonates with Umana *et al.* (2024), who emphasized the role of government policies in promoting effective social housing outcomes. In the case of Taita Taveta, proactive government involvement in affordable housing

projects has contributed to increased socio-economic security, validating the role of institutional frameworks in ensuring project success.

These quantitative findings are further corroborated by qualitative evidence obtained through KIIs and FGDs conducted in the county. Respondents widely recognized the contributions of mega housing infrastructure projects to improved housing conditions, reduction of informal settlements, and promotion of community stability. Participants noted that access to affordable housing will not only enhance dignity and social cohesion but also generated employment in the construction sector and related industries. The following excerpts from the qualitative data substantiate the regression results and theoretical interpretations.

“The new houses will help many families move out of informal settlements and live in better conditions.” (Participant, FGD Voi Sub-County)

This statement confirms the reduction in informal settlements and highlights improved living standards, consistent with the principles of sustainable development theory and Wang *et al.* (2021)’s emphasis on social integration.

“Many young people got jobs when the county started building the housing units. Some are still working in maintenance.” (Participant, FGD Mwatate Sub-County)

This quote demonstrates how housing projects have stimulated local employment opportunities, aligning with the observation that such initiatives promote economic inclusivity and stimulate local economies.

“The county government’s housing program will help low-income families own decent homes.” (Government Official, KII-6)

This supports Umana *et al.* (2024)’s findings on the role of government policies in facilitating home ownership and improving socio-economic security, reinforcing the importance of institutional frameworks in project success.

“We have the problems of overcrowding, but now the housing project will help reduce that, and people feel safer.” (Participant, FGD Wundanyi Sub-County)

This statement illustrates the enhanced social stability and improved community safety that result from decent housing conditions, validating the argument that housing infrastructure fosters socio-economic security. Finally, resource-based theory (Barney, 1991) underscores how housing infrastructure can be leveraged as a critical resource for regional competitiveness. Taita Taveta's investment in affordable housing appears to enhance its socio-economic profile, making the region more attractive for investment, workforce retention, and community integration. The positive and significant influence of housing projects reinforces their role as a catalyst for sustained socio-economic development.

CONCLUSIONS AND RECOMMENDATIONS

The findings revealed that mega rail network projects, notably the standard gauge railway, had a positive but non-significant influence on socio-economic security in the county. While the railway project improved regional connectivity, mobility, and trade facilitation, the anticipated broad-based socio-economic benefits have not been fully realized. Employment opportunities generated by the rail infrastructure were temporary and largely limited to the construction phase, with minimal long-term impacts on job creation and income levels for the local population. Additionally, the integration of the SGR into the local economy remains limited, reducing its overall contribution to socio-economic security.

On the other hand, mega road network infrastructural projects demonstrated a positive and significant influence on socio-economic security. The expansion and rehabilitation of major roads improved transportation efficiency, enhanced access to markets, and reduced travel time. These improvements facilitated trade, stimulated business activities, and created employment opportunities in the county. Additionally,

improved road infrastructure enhanced access to social services such as healthcare and education, contributing to the overall well-being and economic stability of communities.

The study further concludes that mega housing projects had a positive and significant effect on socio-economic security. These housing initiatives improved living standards by increasing access to affordable housing and reducing informal settlements. The projects also contributed to social stability and community integration while attracting investment and creating employment opportunities in the construction sector. However, challenges related to affordability for low-income households and gaps in supporting infrastructure such as water, sanitation, and roads were noted.

Based on the findings, the study recommends that county and national government agencies should develop targeted socio-economic empowerment programmes aimed at improving household livelihoods, particularly in rural and marginalized areas. These interventions should focus on enhancing access to employment opportunities, promoting skills development, and facilitating access to affordable social services such as healthcare, education, and clean water. Further, there is a need to strengthen social protection mechanisms and poverty alleviation initiatives to cushion vulnerable populations against economic shocks and structural inequalities that continue to undermine socio-economic security.

Further, the study suggests that future infrastructural projects should be designed and implemented in a more inclusive, participatory, and equitable manner. It is imperative for the County Government of Taita Taveta, in collaboration with development partners, to ensure balanced distribution of infrastructural investments across all sub-counties, with special focus on remote and underserved regions. Additionally, there should be deliberate efforts to involve local communities in planning, decision-making, and monitoring of infrastructural projects to enhance ownership, sustainability, and responsiveness to community needs. Effective maintenance of existing infrastructure should also be prioritized to maximize the long-term socio-economic benefits of the investments made.

Based on the findings, there is need to strengthen the role of infrastructural investments as catalysts for inclusive and sustainable development in the county. The County Government of Taita Taveta, in collaboration with national agencies such as the Kenya National Highways Authority (KeNHA) and the Kenya Urban Roads Authority (KURA), should prioritize the expansion, upgrading, and maintenance of the county's road networks. Given the demonstrated significant and positive relationship between mega road infrastructure and socio-economic security, there is an urgent need to accelerate investment in road connectivity, especially in remote and underserved regions of the county. Expanding rural and feeder road networks will connect smallholder farmers, traders, and residents to major economic hubs such as Voi, Taveta, and Wundanyi, thereby facilitating equitable access to economic opportunities and essential services.

The county should also develop an integrated transport master plan that coordinates mega road network development with other sectors such as trade, health, and education. Furthermore, robust road maintenance programs should be institutionalized, with a focus on proactive and preventive maintenance practices to ensure the longevity and functionality of the road infrastructure. Public-Private Partnerships (PPPs) should be explored as a mechanism to mobilize additional resources, enhance innovation, and promote local economic participation by involving local contractors and labor.

In regard to mega housing infrastructure projects, the County Government of Taita Taveta, working closely with the State Department for Housing and Urban Development, should scale up the development of affordable housing initiatives to address the growing demand for quality housing. The significant positive relationship between mega housing projects and socio-economic security highlights the need for increased public and private sector collaboration in delivering housing developments that are affordable, accessible, and inclusive. The county should consider implementing subsidized housing schemes, tenant purchase programs, and low-interest mortgage facilities to enable low- and middle-income households to access home ownership.

Additionally, it is recommended that housing developments be designed as integrated human settlements that include essential social amenities such as schools, healthcare facilities, recreational areas, and reliable water and sanitation services. This integrated approach will promote social cohesion, enhance community well-being, and support sustainable urban development. The promotion of mixed-use housing developments that combine residential, commercial, and light industrial spaces should also be considered to stimulate local economic activity and job creation.

Lastly, the County Government of Taita Taveta should strengthen institutional capacity in infrastructure governance to optimize the delivery and impact of mega projects. This includes training county officials and project managers in best practices for project planning, procurement, contract management, and monitoring and evaluation. Diversifying resource mobilization strategies, such as exploring municipal bonds, infrastructure levies, and green financing mechanisms, will help supplement traditional funding sources. Finally, establishing comprehensive monitoring and evaluation frameworks is essential to assess the long-term socio-economic impacts of mega road and housing projects and to facilitate data-driven policy decisions.

REFERENCES

- Adan, S. M. (2022). *Assessing the economic security impacts of COVID-19 pandemic: Key responses and challenges in Kenya* (Master's thesis, University of Nairobi).
- African Development Bank (AfDB). (2021). *African economic outlook 2021: From debt resolution to growth: The road ahead for Africa*. Retrieved from <https://www.afdb.org>
- African Development Bank (AfDB). (2022). *Africa's Infrastructure: Investing for Growth and Poverty Reduction*. AfDB Publications.
- County Government of Taita Taveta. (2023). *Taita Taveta County Integrated Development Plan (2023-2027)*.
- Darin-Mattsson, A., Fors, S., & Kåreholt, I. (2017). Different indicators of socioeconomic status and their relative importance as determinants of health in old age. *International Journal for Equity in Health*, 16(1), 173. <https://equityhealthj.biomedcentral.com/articles/10.1186/s12939-017-0670-3>
- Energy and Petroleum Regulatory Authority (EPRA). (2023). *Annual energy sector report 2022/2023*. Retrieved from <https://www.epra.go.ke>
- Foster, V., & Briceno-Garmendia, C. (2022). *Africa's Infrastructure: A Time for Transformation*. World Bank Publications.
- Foster, V., Gorgulu, N., Straub, S., & Vagliasindi, M. (2023). *The impact of infrastructure on development outcomes: A qualitative review of four decades of literature*. The World Bank.
- International Energy Agency (IEA). (2021). *World energy outlook 2021: Addressing energy access challenges*. Retrieved from <https://www.iea.org>
- Ivanov, V. (2019). *The impact of infrastructure projects on social-economic territorial development*. *Advances in Economics, Business and Management Research*, 83, 637-645.
- Karpenko, L., Izha, M., Chunya, I., Maiev, A., & Hunko, K. (2021). *The growth of the country's economic security level based on investment infrastructure development projects*. *Entrepreneurship and Sustainability Issues*, 8(4), 713-729.
- Kenya National Bureau of Statistics. (2023). *Economic survey 2023: Socio-economic indicators in Kenya*. KNBS. Retrieved from <https://www.knbs.or.ke>

- Kiai, R. (2021). Socio-economic determinants in sustainability of urban infrastructure projects: A case of KURA roads projects in Laikipia County, Kenya. *African Journal of Infrastructure Development*, 18(1), 67-82.
- Kimani, J., & Mwangi, P. (2021). *The Role of Infrastructure in Enhancing Economic and Social Development in Kenya*. *International Journal of Development Studies*, 18(4), 45-63.
- Kothari, C. R. (2014). *Research methodology: Methods and techniques* (2nd ed.). New Age International.
- Lesutis, G. (2021). Infrastructural territorialisations: Mega-infrastructures and the (re)making of Kenya. *Political Geography*, 89, 102459. <https://doi.org/10.1016/j.polgeo.2021.102459>
- Mburu, S., & Karanja, D. (2022). *Impact of Mega Infrastructure Projects on Economic Growth and Social Well-being in Kenya*. *Journal of African Economic Development*, 25(3), 78-92.
- Muriithi, K. (2019). Impact of infrastructure projects on socio-economic outcomes in Nairobi County. *Kenya Journal of Development Research*, 10(5), 33-48.
- Njoroge, R., Kamau, T., & Otieno, J. (2023). *Socio-Economic Implications of Mega Infrastructure Projects in Kenya's Peri-Urban Regions*. *African Journal of Policy Studies*, 20(2), 56-71.
- Ouma, G., & Achieng, L. (2019). *Infrastructure and Socio-Economic Security in Kenya: A Case Study of Rural Development Projects*. *East African Journal of Social Sciences*, 14(1), 102-117.
- Oyelana, S., Shrestha, O., Sihotang, M., Marsel, M., & Walsham, S. (2022). *Assessing the socio-economic impact of infrastructure development on local communities: A mixed-methods approach*. *Sosateris*, 11(1), 1-8.
- Taber, K. S. (2018). The use of Cronbach's Alpha when developing and reporting research instruments in science education. *Research in Science Education*, 48(6), 1273–1296. <https://doi.org/10.1007/s11165-016-9602-2>
- United Nations Development Programme (UNDP). (2023). *Human Development Report 2023: Uncertain times, unsettled lives: Shaping our future in a transforming world*. Retrieved from <https://www.undp.org>
- United Nations Development Programme. (2023). *Human development report 2023: The future of socio-economic security*. Retrieved from <https://www.undp.org>
- United Nations Development Programme. (2024). *Socio-economic resilience is critical to advancing sustainable peace and security in East Africa*. <https://www.undp.org/africa/press-releases/socio-economic-resilience-critical-advancing-sustainable-peace-and-security-east-africa>
- United Nations. (2022). *Sustainable infrastructure for development report*. Retrieved from <https://www.un.org>
- Walker, R. J., Williams, J. S., & Egede, L. E. (2023). Food insecurity, neighborhood food environment, and health disparities. *The American Journal of Clinical Nutrition*, 117(1), 1–2. <https://academic.oup.com/ajcn/article/117/1/1/6693371>
- World Bank. (2021). *Infrastructure for Development: Unlocking Economic Growth and Reducing Inequality*. Washington, DC: World Bank Publications.
- World Bank. (2021). *Socioeconomic impacts of COVID-19 in Kenya on households: Rapid response phone survey results*. The World Bank. Retrieved from <https://openknowledge.worldbank.org/entities/publication/aeb67f59-3f36-54c9-af1b-827fcd6d59ac>
- World Bank. (2022). *World development report 2022: Infrastructure for development*. Retrieved from <https://www.worldbank.org>

World Economic Forum. (2022). *Infrastructure and development competitiveness report*. Retrieved from <https://www.weforum.org>

Zvarych, I., & Zvarych, O. (2021). *Formation of infrastructural factors of economic development of the region*. *Baltic Journal of Economic Studies*, 7(1), 115-126.