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THE INFLUENCE OF CHANGING LAND USE PATTERNS ON SOCIAL WELL-BEING: A CASE STUDY OF THE MAASAI COMMUNITY IN KITENGELA MUNICIPALITY, KENYA

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ABSTRACT

The transformation of traditional pastoral lands through urbanization presents a critical challenge for the Maasai community in Kitengela Municipality, with profound implications for their social well-being. While previous studies have documented broad changes in land use patterns, there remains a significant gap in understanding how these changes specifically affect the social well-being of the Maasai community. The purpose of this study was to determine the influence of changing land use on the social well-being of the Maasai community in Kitengela Municipality, Kajiado County. The study was informed by the Ecological Modernization Theory, which suggests that continued economic growth and technological advancements can coexist with environmental conservation and sustainability. The study employed a descriptive research design with a target population of 234,000 Maasai community members and 15 Administrative Leaders in Kitengela Municipality. Using stratified random sampling, a sample size of 384 participants was selected. Data was collected using structured questionnaires with closed-ended questions on a five-point Likert scale, following necessary approvals and informed consent procedures. Data analysis employed descriptive statistics and regression analysis using SPSS. The study found a strong positive correlation between changing land use and social well-being ($r = 0.718$, $p = 0.000$), with 94% of participants reporting significant changes in traditional land use patterns. The regression analysis revealed that changing land use significantly predicted social well-being ($\beta = 0.214$, $p = 0.000$), explaining 51.6% of the variance. The study concluded that changing land use patterns significantly influence the social well-being of the Maasai community, with effectively managed changes leading to substantial enhancement in overall community well-being. The study recommended that urban planners and policymakers prioritize balanced land use management through participatory planning processes that integrate traditional pastoral practices with modern urban needs while establishing regular assessment mechanisms to monitor land use impacts on community well-being.

Keywords: *Changing Land Use Patterns, Social Well-being, Maasai Community, Kitengela Municipality, Kenya*

BACKGROUND OF THE STUDY

The transformation of land use patterns has emerged as a critical challenge for the Maasai community, with significant implications for their economic security and cultural identity. Traditional Maasai livelihoods have been fundamentally based on communal rangelands for livestock grazing, providing essential resources through milk, meat, hides, and trade activities (Gai, 2020; Raycraft, 2022). However, extensive research has documented significant changes in these traditional land use patterns, with Mwangi et al. (2017) highlighting the widespread conversion of former grazing areas into large and small-scale farms. The scale and impact of these land use changes are particularly severe in the Kajiado region. Studies indicate that more than 70% of the Kajiado rangelands have been converted since the 1960s, significantly reducing available dry season grazing reserves (Mugambi, 2022). This transformation has led to increased pressure on remaining grasslands, resulting in overgrazing and pasture degradation, which in turn has negatively affected livestock conditions and household incomes derived from livestock products (Michalk et al., 2019). The loss of grazing lands to agriculture, infrastructure development, and urban expansion has severely impacted pastoral mobility and livestock production among Maasai households (Ameso et al., 2018; Gai, 2020).

In peri-urban areas near major cities like Nairobi, the situation is particularly acute. Land has become increasingly privatized and subdivided into smaller plots that are unsuitable for grazing (Kore, 2019). This transformation has catalyzed several negative outcomes, including unplanned development, expansion of poverty in informal settlements, and increased pressure on infrastructure such as water, housing, and sanitation facilities (Koyamo, 2022). The impact is particularly severe on vulnerable community members, with Feldt et al. (2020) noting that income inequality is especially high in these areas, where those lacking education or assets struggle to transition from eroding pastoral lifestyles. The broader effects of these land use changes extend beyond immediate economic impacts. According to Achola (2021), escalating changes in land use patterns have threatened traditional pastoral socioeconomic organization, precipitating both livelihood stress and cultural changes. The situation is further complicated by increased human-wildlife conflicts in Maasai communities near conservation areas, where the loss of dry season grazing lands has led to substantial economic costs associated with livestock predation (Nyerembe, 2020). Local research by Odongo and Donghui (2021) emphasizes that the growth of urban areas, particularly Nairobi, has had substantial impacts on nearby rural regions, affecting both land utilization patterns and population dynamics. These changes extend beyond mere physical proximity, fundamentally altering the social wellbeing structure of these regions.

Statement of the problem

The transformation of traditional pastoral lands through urbanization presents a critical challenge for the Maasai community in Kitengela Municipality, with profound implications for their socioeconomic well-being. While previous studies have documented broad changes in land use patterns, such as Mwangi et al.'s (2017) analysis of grazing area conversion and Mugambi's (2022) finding that over 70% of Kajiado rangelands have been transformed since the 1960s, there remains a significant gap in understanding how these changes specifically affect the social well-being of the Maasai community in Kitengela Municipality. Research by Ameso et al. (2018) and Gai (2020) has highlighted the impact of lost grazing lands on pastoral mobility and livestock production,

while Michalk et al. (2019) documented the effects of overgrazing and pasture degradation on household incomes. However, these studies have primarily focused on the economic aspects of land use change without comprehensively examining its broader implications for community social well-being, including impacts on social cohesion, cultural preservation, and community resilience within Kitengela's unique peri-urban context.

Current research gaps are particularly evident in understanding the complex relationship between changing land use patterns and social well-being indicators in rapidly urbanizing areas. While Kore (2019) and Koyamo (2022) have documented the increasing privatization and subdivision of land near urban centers, and Feldt et al. (2020) have noted the resulting income inequalities, there remains insufficient empirical evidence about how these land use transitions specifically affect the social fabric of the Maasai community in Kitengela Municipality. Furthermore, although Odongo and Donghui (2021) have established that Nairobi's growth substantially impacts nearby rural regions, and Nyerembe (2020) has highlighted increased human-wildlife conflicts due to land use changes, there is a critical need for quantitative analysis that measures the direct relationship between changing land use patterns and specific social well-being indicators. This knowledge gap limits the development of effective policies and interventions that could help the Maasai community adapt to changing land use patterns while maintaining their social well-being and cultural integrity.

Objective of the study

To determine the influence of changing land use on the social well-being of the Maasai community in Kitengela Municipality, Kajiado County.

Research Question

To what extent does changing land use impact the social well-being of the Maasai community in Kitengela Municipality, Kajiado County?

LITERATURE REVIEW

This section presents the literature review that includes theoretical review which examines the Ecological Modernization Theory, empirical review that synthesizes previous research studies on land use changes and social well-being, and the conceptual framework that illustrates the relationship between changing land use patterns and social well-being of the Maasai community in Kitengela Municipality.

Theoretical Framework

The Ecological Modernization Theory provides a crucial theoretical foundation for understanding the complex relationship between land use changes and social well-being in the context of urbanization's impact on the Maasai community. Developed by Joseph Huber in the 1980s and further advanced by scholars (Mol & Spaargaren, 2000; Buttel, 2000), this theory seeks to reconcile economic development with environmental protection, offering valuable insights into how urbanization-driven land use changes affect traditional communities like the Maasai in Kitengela Municipality. At its core, the theory posits that continued economic growth and technological advancements can coexist with environmental conservation and sustainability (Mol

& Spaargaren, 2000). This theoretical perspective is particularly relevant to understanding the Maasai community's situation, as it suggests that as societies become more affluent and technologically advanced, they develop an increased awareness of environmental issues and a greater capacity to address them (York et al., 2010). The theory proposes that environmental protection can be achieved through technological innovations, policy reforms, and changing societal values (York & Rosa, 2003).

The theory's key assumptions provide a framework for analyzing land use changes in Kitengela Municipality. First, it assumes the potential for both economic development and ecological preservation to be mutually reinforcing rather than contradictory goals (Mol & Spaargaren, 2000; York & Rosa, 2003). Second, it emphasizes the role of technological innovations in reducing environmental impacts (Mol & Spaargaren, 2000; Huber, 2008). Third, it highlights the importance of policy reforms, including environmental regulations, economic incentives, and public-private partnerships, in driving sustainable practices (Mol & Spaargaren, 2000; York & Rosa, 2003). Finally, it recognizes the significance of changing societal attitudes towards more environmentally-friendly practices (Mol & Spaargaren, 2000; Buttel, 2000). While the theory offers hope that environmental preservation and economic progress can coexist (Buttel, 2020) and provides a framework for achieving sustainable development through technological advancements and policy reforms (York & Rosa, 2003), it has faced criticism. Critics argue that it underestimates the structural barriers and power dynamics that can hinder sustainable transformations, particularly in developing countries (Buttel, 2020). Additionally, the theory has been criticized for its technocentric approach and for overlooking potential rebound effects of increased consumption enabled by efficiency gains (Fisher & Freudenburg, 2001).

In the context of Kitengela Municipality, the Ecological Modernization Theory suggests that urbanization and associated changes in land use can be managed through technological innovations, policy reforms, and changing societal attitudes towards more sustainable practices. This theoretical framework provides a lens through which to examine how land use changes can potentially be managed to minimize negative impacts on both the environment and traditional livelihoods, thereby influencing the socioeconomic well-being of the Maasai community. The theory's emphasis on balancing development with environmental protection offers valuable insights for developing solutions that can help preserve the Maasai's traditional land use practices while adapting to urban development pressures.

Empirical Literature Review

Cristo et al. (2022) examine community social status and land-use changes along the carajás railroad in the eastern Amazon. The research looked at environmental factors by analyzing Google Earth photos qualitatively and socioeconomic factors by examining 17 variables. The research found that rural areas in Maranhão had lower poverty rates and greater earnings compared to metropolitan populations. The overall sustainability of the state was found to be worse, nonetheless, due to poor socioeconomic indicators and notable shifts in land cover. Study also found that communities near the railway had greater socio-environmental condition variation. Communities at risk, such as those with limited resources, substandard housing, or residing in places experiencing substantial land cover changes, can be better prepared for disasters by

analyzing data from satellite images and socioeconomic surveys, according to the study. Policymakers, managers, and others should prioritize addressing community-level shortcomings, particularly in priority neighbourhoods, according to the study's findings. Researchers in eastern Amazonia tracked the socioeconomic and land-use changes along the Carajás railroad. Thus, the research was carried out in a distinct geographical and cultural setting, which creates a contextual gap, which may not accurately reflect the situation of the Maasai community in Kitengela Municipality.

Appelt et al. (2022) conducted a systematic review to evaluate the social and economic effects, as well as the possible benefits, costs, and synergies, of changing agricultural land usage in Southeast Asia. One hundred twenty-six instances of land use change in agriculture were examined in the research. Income (SDG 1, 100 cases) and employment (SDG 8, 11 cases) had overwhelmingly positive outcomes, whereas health (SDG 3, 9 instances) had variable results. However, economic equality (SDG 10, 14 occurrences), gender equality (SDG 5, 13 cases), and food security (SDG 2, 44 cases) had the worst outcomes. Income, food security, and employment, together with economic equality and income, may have both positive and negative effects, according to the findings. Due to its exclusive emphasis on changes in agricultural land use, the research introduces a conceptual gap, which may not fully capture the dynamics of urbanization and its effects on the social well-being of the Maasai community.

Smith et al. (2019) examine the impact of land usage intensification (LUI) on inequality and human well-being. Several interdisciplinary, multiscale social-ecological methodologies were used in the research. The research discovered that while inequality remained same, wellbeing increased as smallholder commercial and subsistence agriculture became more intensive. The research also found no general correlation between the intensification of unsustainable charcoal production and inequality or well-being. Further, when communities had easily accessible marketplaces, the research discovered that increases in the well-being of the poorest families were only seen when commercial crop production increased. According to the study's findings, localized environmental trade-offs may be short-term offset by the socioeconomic gains of agricultural growth and intensification. Since the research took place in a distinct cultural and geographical setting, it creates a contextual gap, which may not accurately reflect the dynamics of the Maasai community in Kitengela Municipality.

Research by Handavu et al. (2019) looked at how social and economic factors affected land-use and land-cover patterns in Zambia's Copperbelt miombo forests. Researchers used focus groups and household questionnaires to gather information from 372 homes and 30 people living within a 5-kilometer radius of the forest reserves. There were substantial socioeconomic predictors of forest product usage, including gender, age, education, income, family size, and resident status. Findings also indicated that changes in family size accounted for the relationship between population growth and agricultural development, which in turn explained variations in land-use and land-cover. Plus, the research showed that locals rely heavily on forest goods. Numerous socioeconomic variables showed a strong correlation with the utilization of certain forest products, including but not limited to: charcoal, building poles, firewood, wild fruits, honey, wild vegetables, thatching grass, cattle feed, bush meat, and broomstick materials. Since the research took place in

a distinct cultural and geographical environment, it creates a contextual gap, which may not accurately represent the unique dynamics of the Maasai community in Kitengela Municipality. Mootian (2021) conducted a study to determine how land use and land cover have been impacted by social wellbeing activities in Narok North Sub-County, Kenya. Targeting a population of 59,996 homes, descriptive research methodology was employed. The researchers used stratified and systematic random selection methods to choose 100 homes for the study. The research discovered that whereas settlement and agriculture areas rose from 25.2% in 1986 to over 40.6% in 2019, there were notable changes in wooded areas, which decreased from 45% in 1986 to 23% in 2019. The research also determined that political instability, urbanization, poverty, pastoralist lifestyles, religious systems, and lax rules and regulations were among the factors contributing alterations in the distribution of land. The research also discovered a strong correlation between shifts in surface and subsurface land cover as well as social and economic landscape. The research looked at how changes in land cover and usage were affected by socioeconomic activity in Kenya's Narok North Sub-County. Thus, the research failed to address the Maasai community's social well-being or the unique circumstances of Kitengela Municipality, which creates a conceptual gap.

CONCEPTUAL FRAMEWORK

The conceptual framework illustrates the relationship between changing land use patterns and social well-being of the Maasai community in Kitengela Municipality.

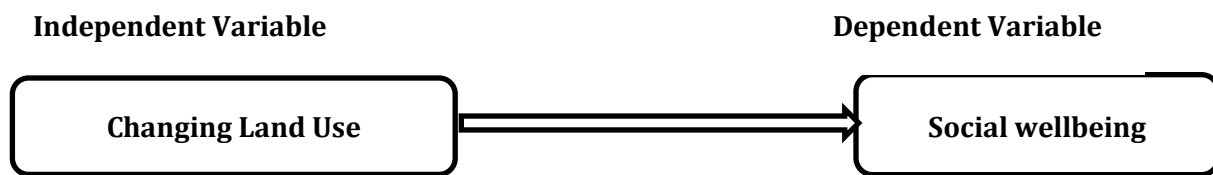


Figure 1: Conceptual Framework

RESEARCH METHODOLOGY

This study employed a descriptive research design to examine the influence of land use changes on the Maasai community's social well-being in Kitengela Municipality. The design was chosen for its ability to provide a detailed characterization of the current situation without manipulating variables (Levin, 2006; Kumar, 2019), and its effectiveness in identifying patterns and relationships between land use changes and social well-being indicators (Shields & Rangarajan, 2013). The target population comprised 234,000 Maasai community members residing within Kitengela Municipality (KNBS, 2019), along with 15 Administrative Leaders including chiefs and community leaders from six areas: Kitengela Town, Isinya, Oloosirkon, Kisaju, Acacia, and Noonkopir. Using stratified random sampling (Ngulube, 2005; Cochran, 1977), the population was divided into strata based on age, gender, socioeconomic status, and length of residence, with Fisher's formula yielding a sample size of 384 participants (Fisher, 1922). This was proportionally distributed across the six areas, with Kitengela Town receiving the largest allocation (131 participants) due to its higher population density. Data collection utilized structured questionnaires



with closed-ended questions on a five-point Likert scale, designed to gather quantitative data on land use changes and social well-being indicators. A pilot study involving 40 participants (10% of the sample size) was conducted following recommendations by Connelly (2008) and Hertzog (2008) to test and refine the research instruments. The data collection procedure began with obtaining necessary approvals from local authorities and community leaders, followed by administering questionnaires to randomly selected participants who provided informed consent. Data analysis employed descriptive statistics and regression analysis using SPSS, with the regression model $Y = B_0 + B_1X_1 + \epsilon$ specifically focusing on the relationship between land use changes (X_1) and social well-being (Y), where B_0 represents the constant and ϵ the error term. The systematic nature of this methodology ensured reliable and valid findings while maintaining ethical standards through informed consent, voluntary participation, confidentiality, privacy, and anonymity measures.

FINDINGS AND DISCUSSION

The study achieved an exceptionally high response rate of 96% (368 out of 384 questionnaires), demonstrating strong community engagement and enhancing the reliability of findings. The demographic composition revealed a predominantly male representation at 72% (264 respondents) compared to 28% female (104 respondents), reflecting the traditional patriarchal structure of Maasai society and its influence on community decision-making processes. Age distribution showed a concentration in the middle-aged bracket, with 48% (177) of respondents aged 41-50 years, followed by 28% (103) aged 31-40 years, 15% (54) above 51 years, and 9% (34) between 20-30 years, indicating a sample population with substantial life experience and community involvement. Regarding residency duration, half of the respondents (50% or 183) had lived in Kitengela Municipality for 5-10 years, while 31% (115) had resided there for over 11 years, and 19% (70) for less than 5 years, suggesting that most participants had significant exposure to the area's urbanization process. The educational profile revealed a relatively well-educated sample, with vocational/technical training and undergraduate degrees each representing 29% (108 and 105 respondents respectively), followed by equal proportions (13% each) of secondary education and postgraduate degrees (48 and 46 respondents), while primary education accounted for 9% (34) and those with no formal education comprised 7% (27), indicating that 71% of respondents had education beyond the secondary level, potentially influencing their perceptions and experiences of urbanization impacts on land use changes and social well-being.

DESCRIPTIVE STATISTICS FOR CHANGING LAND USE

This subsection examines the respondents' views on how land use has changed in their community due to urbanization. It covers aspects such as urban development, grazing land availability, changes in traditional land usage patterns, and effect of these changes on Maasai community.

Table 1: Descriptive Statistics for Changing Land Use

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. D
Area of urban development has increased in our community.	18%	38%	6%	22%	17%	2.81	1.40
The amount of available grazing land has decreased.	6%	5%	2%	71%	17%	3.87	0.95
The degree of change in traditional land use patterns has been significant.	2%	0%	4%	82%	12%	4.00	0.62
The conversion of land from pastoralism to urban development has negatively impacted my community.	1%	1%	14%	56%	29%	4.11	0.71
The loss of grazing lands has affected the traditional livelihood activities of the Maasai community.	1%	0%	12%	26%	61%	4.46	0.78
The Maasai community has faced challenges in adapting to the changes in land use.	5%	1%	12%	20%	62%	4.34	1.06
Average						3.932	0.919

Table 1 shows majority (94%) of participants agreed that degree of change in traditional land use patterns has been significant, with mean of 4.00 and SD of 0.62. This table also indicates that a majority (88%) agreed that the amount of available grazing land has decreased, with mean of 3.87 and SD of 0.95. In addition, significant majority (87%) agreed that the loss of grazing lands has affected the traditional livelihood activities of the Maasai community, with mean of 4.46 and SD of 0.78. Table also reveals that a majority (85%) agreed the conversion of land from pastoralism



to urban development has negatively impacted their community, with mean of 4.11 and SD of 0.71. Further, a majority (82%) agreed that the Maasai community has faced challenges in adapting to the changes in land use, with mean of 4.34 and SD of 1.06. However, only a minority (39%) agreed that the area of urban development has increased in their community, with mean of 2.81 and SD of 1.40. Overall mean for changing land use is 3.932 with SD of 0.919. This mean score, close to 4 on a 5-point scale, implies that respondents generally agree that significant changes have occurred in land use due to urbanization. SD of 0.919 shows moderate level of consistency in responses.

Correlation Analysis

The correlation analysis examined the relationship between changing land use and social well-being of the Maasai community in Kitengela Municipality.

Table 1: Correlation between Land Use Changes and Social Well-being

Variable	Social Well-being	Changing Land Use
Social Well-being	1.000	
Changing Land Use	0.718**	1.000
p-value	0.000	

** Correlation is significant at the 0.01 level (2-tailed)

The correlation analysis reveals a strong positive relationship between changing land use and social well-being ($r = 0.718$, $p = 0.000$). This robust correlation coefficient suggests that land use transformations significantly influence the community's social well-being, aligning with Smith et al.'s (2019) findings that land use intensification affects community well-being outcomes, though their study specifically noted improvements with agricultural intensification. The strong positive correlation indicates that as land use patterns change due to urbanization, there are corresponding significant changes in the social well-being of the Maasai community.

Regression Analysis

The regression analysis determined the predictive relationship between changing land use and social well-being.

Table 2: Regression Model Summary

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	0.499	0.117		4.281	0.000
Changing Land Use	0.16	0.024	0.214	6.611	0.000

The regression analysis reveals that changing land use is a significant predictor of social well-being in the Maasai community. The regression coefficient ($B = 0.160$, $p = 0.000$) demonstrates that for every one-unit increase in land use change, there is a corresponding 0.160-unit increase in social well-being, holding other factors constant. The standardized beta coefficient ($\beta = 0.214$) indicates the relative strength of the relationship, while the t-value of 6.611 confirms the statistical significance of the relationship. These findings align with Smith et al.'s (2019) research, suggesting that land use changes significantly influence community well-being when managed effectively.



Conclusion

The study concludes that changing land use patterns significantly influence the social well-being of the Maasai community in Kitengela Municipality. The findings demonstrate that land use transitions play a pivotal role in shaping community outcomes, with effectively managed changes leading to substantial enhancement in overall community well-being. This relationship indicates that while land use transformation presents challenges to traditional pastoral practices, when properly managed with consideration for both urban development needs and traditional practices, it can contribute positively to community social well-being.

Recommendations

The study recommends that urban planners and policymakers prioritize balanced land use management in Kitengela Municipality through participatory planning processes that actively involve the Maasai community. This should include developing sustainable urban development strategies that integrate traditional pastoral practices with modern urban needs, while establishing regular assessment mechanisms to monitor land use impacts on community well-being. Implementation of buffer zones between urban development and traditional pastoral lands, coupled with comprehensive land use policies that protect areas of cultural significance, will help maintain a balance between modernization and traditional practices.

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