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EFFECT OF LAND USE CONVERSION ON SOCIAL DEVELOPMENT AND MOBILITY IN KANO METROPOLIS, NIGERIA

BY

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Abstract

This study on the effect of land use conversion on social development in Kano State, Nigeria, used a cross-sectional design. Data were sourced through a structured questionnaire. The target population consists of the total number of registered houses in Kano State, as per the Ministry of Land in Kano State, which is 74,878, and 398 was used as the sample size. The study used descriptive tools include frequency and percentage, while inferential techniques; multiple regression was employed. The result showed that economic activities connected to the road (0.557) is positive and statistically significant at 1% level. Access to road transport in marketing agricultural produce (0.20) had a positive coefficient and was statistically significant at 5% level. Flow of business activities in the settlement (0.45) is positive and significant at was 5% level, etc. It was recommended that increasing employment boosts livelihoods and improves the social fabric of a community, and policymakers should take note of this in decision-making. The periodic markets, which occur on specific days in a week or month, play a crucial role in social development; therefore, the stakeholders should endeavour to increase the number of periodic markets for the improvement of social development.

Keywords: Land use conversion, social development, Mobility

1.0 Introduction

Globally, land is used for different purposes. It is not limited to residential, but religious, commercial farming, companies among other purpose (Gbenga & Lukman, 2022) Also the proportion of land allocated to various use in different parts of the world vary tremendously depending on the level of development, compliance with the planning regulations and the purpose to which the land is to be put (United Nations Environment Programme

Annual Report, 2010). Increase need or demand for land led to increases in land use. According to Harewan et al (2023), the incidence of land conversion is caused by the fluctuating demand for land to meet the demands of the people. The use of restricted land is optimised based on the type and features of the land used by the community. Optimisation may also be described as the process of attaining a state that offers the maximum or minimum value of a function, which explains that the element of population requirements can be one of the drivers of land demand since land demand can impact the socio-cultural and economic aspects of society. It is possible to say that the utilisation of other purpose areas (OPA) serves to sustain life support systems in a given region. The outcomes of land use, which are often measured by economic and development indices, reveal the contribution of land use. Strategies for development that help economic growth affect how land, labour, capital, and technology are used to make things. Utilising these production criteria has consequences for land conversion (Akinbabijo, 2019).

2.0 Land Conversion

According to Harewan et al (2023), Land conversion, also known as "land use change," is a shift in the function of a part or all of the land area from its original use (as designed) to another function that has an influence on the environment and on the land's potential. This influence can be positive or negative. Regardless of the land's physical suitability for various land uses, land needs provide social, economic, and environmental ramifications of land use change (Abdurashid & Muhammadbek, 2020).

2.1 Development and Social Development

Development is defined as the general improve in the standard of living of the majority of population of a country. While social development it is a process which results in changes in social institutions that improve the productive capacity of societies fulfil its objectives. It shows the qualitative change in the ways societies Mold itself and carry out their progressive attitudes and behaviour of the citizens. There is a close relation among environments, ways of living and technology (Barbier, 2021). It is a complexity of social changes and focuses of citizens and the environment. Social development indicator lists also include information about the environment. Richard Estes, a co-developer of Hong Kong's social report in 2000, noted that the report included a sub-index on environmental quality with ratings of solid waste recycling, beaches, public open space and fresh water consumption.

2.3 Empirical review

Gbenga and Lukman (2022), investigated the impact of residential land use change on intra urban road network in Akure, Nigeria. Four major intra-urban roads in the city centre were considered in this research, and a total of 150 houses and residents within 200m distance from the roads, which amounted to 5% of the buildings within the study area, were sampled. Information, relating to road network, condition of road, level of land use conversion, among others, was gotten with Geographic Information System (GIS), questionnaire, personal observation and interviews were used. Data was analysed using both descriptive and inferential techniques. Based on the findings, the study revealed that most residential land use along intra urban roads in the city centre had been converted to commercial land use either totally or partially. The study affirmed that, residential land use change has both physical and socio-economic impacts on road network development and the environment. It recommended that, proper land use planning, establishment of a commercial centre to cater for the city's commercial needs and the preparation and implementation of a transportation master plan will reduce the

problems observed. This will ensure adequate intra-urban road management as well as sustainable urban development in Nigeria.

Isola-Muyideen, (2025) study was conducted in Ibadan Municipality of Oyo State, Nigeria, with the aim of analyzing the various impacts of residential-commercial land use conversion within the City. Both primary and secondary sources of data were employed. Basically, a well-constructed questionnaire was administered to the occupants of the buildings along fourteen (14) selected roads in the study area. These selected roads entail three categories of roads (Trunk A, B, and C) that has experienced a high level of residential-commercial land use conversion in the five Local Government Areas of Ibadan Municipality. The study revealed that an increase in the conversion of residential land use to commercial land use has more positive economic impacts on the people than social and cultural impacts. This study concluded that residential-commercial land use conversion is an unavoidable, significant product of urban growth. Hence, the decision makers on land use development matters should involve 'mixed land use' in land use categories when planning for cities and towns.

Afolabi et al (2025) study focuses on Residents' Socioeconomic Characteristics and the Pattern of Residential Mobility in Osogbo, Nigeria. Using both primary and secondary data. Primary data obtained from households in Osogbo and Olorunda Local Government Areas LGAs. Information obtained from INEC showed that there were 26 electoral wards in the study area. A stratified random sampling technique was employed to select 9 electoral wards that were sampled. After adopting this procedure, a questionnaire was administered to four hundred and ninety-nine (499) households in the study area. Secondary data obtained were the maps of the study area. Data were analysed using binomial logistic regression and factor analysis. Findings show that most residents (87.1%) have moved at least once within Osogbo. While 12.9% of the sampled population have not moved. 7%, 4.9% and 1% of this are from the core, transition and suburban zones of Osogbo, respectively. The study concluded that special consideration must be given to the socioeconomic characteristics and the pattern of residential mobility of residents, overall housing quality, neighbourhood conditions and attributes, among others, which varied along the different residential areas of Osogbo.

Owoeye and Ogunleye (2015) in their analysis of structure and pattern of the changes and the causative factors of residential land use around the Ekiti State University (EKSU), Ado-Ekiti, it was discovered that there is one special characteristic of the changes where most of the actors are academicians of who majority are students tenants with few staffs of the institution living among the host community which seems to be a motivating factor that speeds up the rate of development and changing land use pattern around the university community.

Ogunbode et al (2025) research explores the patterns and drivers of land use changes over the past four decades and evaluates their effects on environmental quality and urban livelihoods. A combination of remote sensing and survey methods was employed. Landsat images from 1982 to 2023 were analysed using supervised classification techniques to map changes in land cover categories such as built-up areas, vegetation, farmland, bare land, and water bodies. Additionally, a survey was conducted with 550 residents, selected through simple random sampling, to identify the key drivers of urban expansion from the residents' perspectives. Descriptive analysis revealed that most respondents had lived in Iwo for over 30 years, with many engaged in farming, trading, and civil service. Factor analysis was used to identify significant variables driving urban growth. The results indicate a substantial

increase in built-up areas, from 9.30 km2 in 1982 to 30.69 km2 in 2023, alongside a significant decrease in vegetation cover. Farmland area showed an increasing trend, while bare land decreased. This study highlights the importance of sustainable urban planning to balance growth with environmental preservation and social equity. The implementation of green infrastructure, effective waste management, and comprehensive urban planning policies is crucial to enhancing resilience and quality of life in Iwo.

2.4 Theory of Transformation of Society

According to Vasin (2023), theories characterising the dynamics of the development of society can be classified according to the principle of limiting the dynamic process by certain frames. Some theories explain specific changes or transitions (transformations) from one form to another (the catastrophe theory, the theory of economic pathology, the theory of transition economy, the cycle theory, etc.). Other theories describe the socio-economic dynamics in a continuous flow with stagnation and transformation, with smooth growth and decline, etc. (the evolutionary theory, the institutional theory, and synergetic and civilisation approaches). The conducted theoretical analyses of various theories of socio-economic dynamics form the basis for understanding the features of the transformation of socio-economic systems. At the same time, it is often impossible to explain such dynamics via a single theory. Complex and informal broad views and assessments of various cases of dynamics to explain the prerequisites, the course of the process, and an increase in the level of systemic stability are inevitable. It should also be noted that the separation of theories from each other is also erroneous. The boundaries between them are blurred, and the principles are often similar. From this fact, the conclusion follows regarding the expediency of their complementarity, as well as the explanation of one theory at the expense of another.

3.0 Methodology

3.1 Study Area

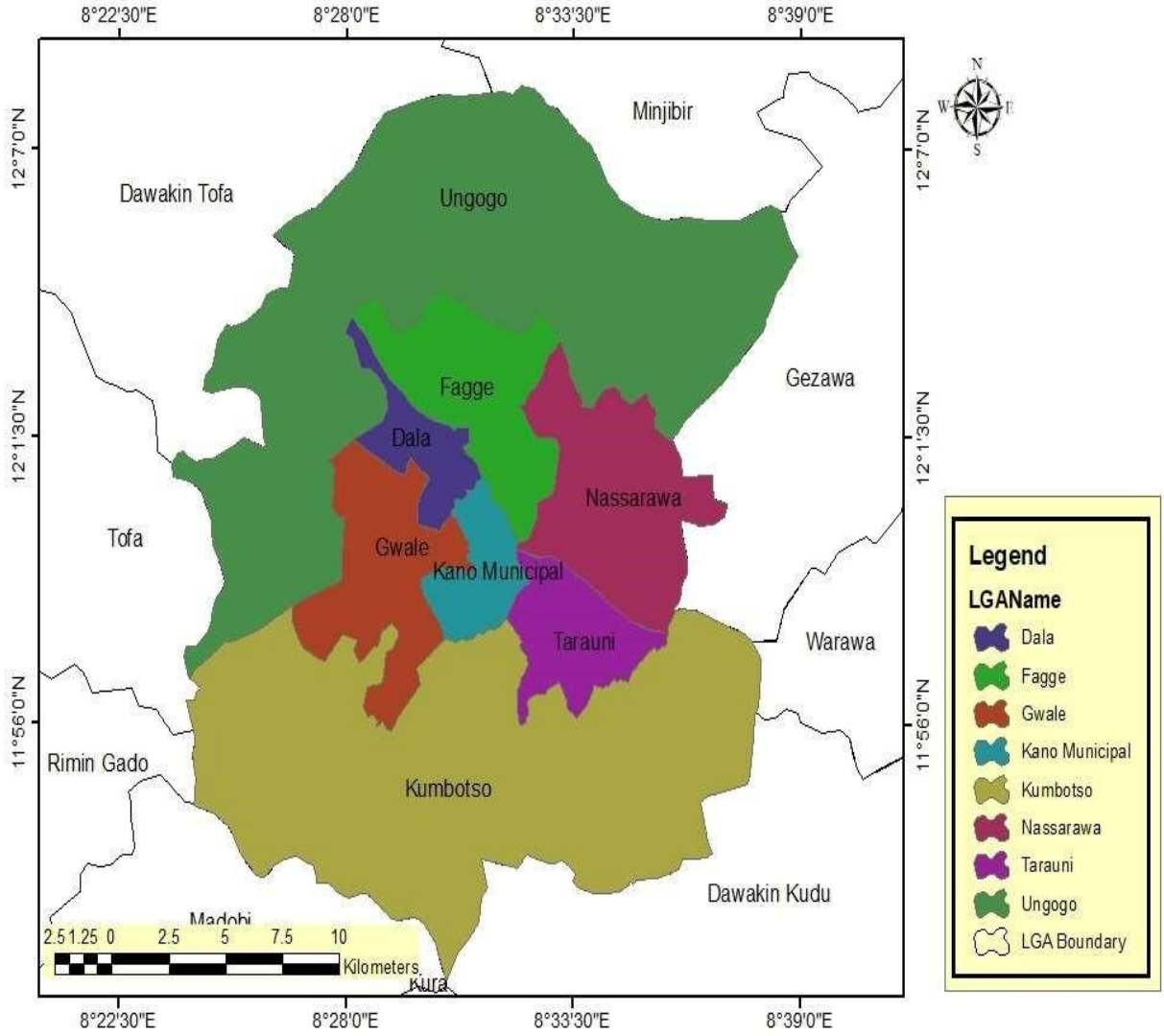
Kano city is the state capital of Kano state, established in 1967. It is the largest city in the northern part of the country and second in the country, located at 10030N and 130N between longitude 7040'and 10035'E, and is 1549feet above sea level. The master plan of 19631983 established the spatial dimension of Kano metropolis. The areas of coverage include urban Kano and the districts of Ungogo and Kumbotso. Today metropolis has expanded beyond that and covers Nassarawa, Municipal, Fagge, Nasarawa, Tarauni and Dala. and Part of Tofa Local Government Area, Dawaki Kudu, Gezawa and Minjibir.

The state has a tropical continental climate, this type of climate has clear wet and dry seasons with more dry than wet months (Mortimore, 1989), which is categorised under in Koffen's climatic classification. The state has an annual rainfall of 880mm, and it is characterised by four months of wet and eight for dry seasons. The state temperature is warm and hot throughout the year. It has been believed that the annual temperature is about 26 °C, and the coolest months range between 21 °C and the hottest months range is estimated at 31 °C. ET is higher than precipitation with 2538mm per annum.

The study area is normally divided into four climatic periods annually: the warm rainy season (June -September), the cool dry season (November-February), the hot dry season (March-May) and the warm dry season (October- November).

According to Ahmad (2020), the study area forms part of the plains of the Hausa land, and it is generally plain with elevation not higher than 600 metres above sea level. The general relief of the study area is between 485 metres

and 570 metres. The area is characterised by basement complex rocks and granite materials. The materials consist of metamorphic and igneous rock types of Precambrian origin. The soil is matured on the plain, but seriously altered due to human settlement. The influence of topography, wind drift materials, and climate is what shaped the aggregate of the soil. The soil is, however, well drained, brown to reddish in colour.



3.2 Research Design

The current study used a cross-sectional survey design to analyse the effects of land use conversion on social development in Kano Metropolitan. The data was collected using a structured interview schedule. Descriptive statistics such as mean, percentage, and frequency were used to analyse the data. Inferential techniques such as correlation and multiple regression were employed

3.2 Population of the study

Based on the above, the target population of this study consists of the total number of registered houses in the study area with the Ministry of Land in Kano state, which is 74,878

3.4 Sampling Procedure and Sample Size

This study used a purposive sampling procedure in selecting eight local governments in the Kano state metropolitan area. These include Municipal, Nassarawa, Fagge, Gwale, Tarauni, Dala, Ungogo, Kumbotso. This could be a result of the intensity of converting residential land to commercial purposes. The sample has been chosen from the total population of 74,878 to represent so as to make a reasonable generalisation to the whole population.

Yamane's (1967) formula was used to determine the sample size of SMEs. The formula is given by n = (N/ (1+N (e)2). Where: n = sample size, N = Population size, and e = margin of error set at 5%. n = N/1+N(e)2 74,878/1+74,878(0.0025). 74,878/188.195, n = 398. n/N * 100. 398/74,878 = 0.53

Summary of sampling frame

Local Government	Sampling Frame	Sample Size (0.53%)
Municipal	2,534	14
Nassarawa	8,634	46
Fagge	12,354	65
Gwale	1,610	9
Tarauni	22,195	118
Dala	17,719	94
Ungogo	5,524	29
Kumbotso	4,308	23
Total	74,878	398

Source: Author completion, 2023

3.5 Data Collection Procedure

The primary method of data was employed. This was achieved using a structured questionnaire. The data on the independent variable, which is on land use conversion, and the dependent variable, which is on social development was collected from the sampled respondents.

3.6 Techniques of Data Analysis

To achieve this objective, the effect of land use conversion on social development was studied using multiple regression. The regression equation is:

$Y1 = a + b1x1 + b2x2 + b3x3 + \ldots bnxn + e$

Where;

Y1 = Economic development

X1 = Land Area

X2 = land value

X3 = land ownership Earning

X4 = land use guide Plan

X5 = Motor Pack

X6 = Access to City Centre

X7 = Road Functions

X8 = Land Use in the Surrounding.

e = error terms

4.0 Results and Discussion

Summary Statistics results

Respondents are classified based on sex, age, marital status, level of education and occupation. Below, we present the demographic distribution of the collected data.

Table 1: Summary Statistics

Characteristics	FRQ	Percentages	Cumulative frequency
Sex			
Male	194	92	91.51
Female	18	8	100.00
Age			
Less than 18	10	5	4.88
18-30	54	26	31.22
31-40	89	43	74.63
41-50	47	23	97.56
51 and above	5	2	100.00
Marital status			
Divorced	3	1	1.42
Married	192	91	91.98
Single	13	6	98.11
Widowed	4	2	100.00
Level of education			
Primary	49	24	23.75
Quarnic	58	27	50.71
Secondary	73	35	85.31
Tertiary	31	15	100.00
Occupation			
Civil Servant	3	1	1.42
Farming	115	55	55.92
Fishing	35	17	72.51
House wife	8	4	76.30
Trading	50	24	100.00
	Mean	Standard deviation	
Household Size	7.369	4.334	

Source: Field Survey, 2024

The result depicts in the above table showed that most of the respondents t92% are males.it implies that socio economics activities was dominated by males and could be as a result of the tradition and cultural heritage where females normally engage more in domestic activities which makes them always stay indoors. Although, they could be more involved in the other activities such as marketing and processing. The finding is in line with Saheed and Obianuju (2021), which found out that majority of the participants were male.

Table 1.0 shows that, age of the respondents depicts that, less than 18 is 5%, 18-30 is 26%, 31-40 is 43%, 41-50 is 23%, and 51 and above

is 2%. The result indicated that they are within the productive age years 31-40. This also showed they were in their active and productive age. It also implied that younger farmers have strong preference for production activities. The age was important in this study since in the study areas age has a correlation with socio economics activities. It also implied that younger respondents have strong preference for production activities. In a similar finding of Muhammed et al. (2021), who also discovered that, the respondents were within the age bracket of 35-45 year.

Table 1.0 shows that, the married respondents are 91%, divorced 1%, Single 6%, Widowed 2%. This shows majority are married. This indicate that the married people would have cheaper labour than the single farmers who would have to pay for such services or do them by themselves. This result is in agreement with the findings of Saheed and Obianuju (2021), which found out that majority of the respondents were married. The level of education of respondents shows that, Primary 24%, religious education 27%, Secondary 35%, Tertiary 15%. The result further revealed that the level of respondent's education was averagely low. This indicate that respondents had few years in school. This is a similar finding of Otuoze, Hunt, and Jefferson (2021), who discovered that, level of education of the participants was averagely low.

Table 1.0 shows that, Occupation of the respondents shows that, Civil Servant 1%, Farming 55%, Fishing 17%, House wife 4%, Trading 24%. It showed that most of the respondents engage in farming and it is one of their major economics activities in the area. This is in line with the Abubakar and Akinola (2020), majority of the respondents were farmers.

Household Size shows that, means is 7.37 and standard deviation is 4.33. This shows that the respondents had large household size, this is not surprise as many of them had more than one wife which is permissible in their culture. However, polygamy nature of the rural farmers plays significant role for having larger household size. This result strengthens the findings of Sylvanus et al, (2020), this shows that the respondents had large household size.

Variable	Coefficient	Standard Error	T-statistics	P-Value
Economic activities connected to road	0.557	0.179	3.11	0.002
Access to road transport	0.204	0.237	0.86	0.039
Flow of business activities in the settlement	0.455	0.299	1.52	0.013
Access to road in reducing transportation cost	0.181	0.236	0.76	0.044
Number of periodic markets	0.441	0.172	2.56	0.011
Employment generation	0.172	0.250	0.69	0.069

Cons	4.237	.428	9.91	0.000
R2	0.599			
A-R2	0.472			
F 6, 205	3.74			
P value	0.002			

Table 2.0 Result for multiple regression on transportation on social development

Source: Field survey, 2024

Effect of land use conversion on social development. Pseudo R2 (0.599), Adj R-squared (0.4724), F (6, 205) 3.74, Prob > F (0.0015), this showed that the estimated model and the set of explanatory variables fit the data. R2 value implied that the independent variable have explained the dependent one by 59%.

Table 2.0 showed that economic activities connected to road (0.57) is positive and statistically significant at 1%. It implies that unit increase in economic activities connected to road would lead to increase in social development by 55%. This shows that having economic activities in the area such as markets, petty trades, okada, and others situated where they are connected to road increase their social development. This is consistent with work of Adeniyi, et. al (2018), showed economic activities connected to road lead to increase in social development.

Access to road transport had positive coefficient (0.20) and was statistically significant at 5% level. This indicates that a unit increase in access to road transport would lead to the increase in social development by 20%. This shows that access to road transport in the settlement help the people in easy marketing their produce. Access to road makes easy flow of goods and services from one place to another, meaning the farmers can easily supply their produce to the desire destination and the agents can as well enter rural areas to purchases which lead to the increase in their social development. This is in line with the finding of Luis and Alejandro (2018), Access to road transport in marketing of output lead to the increase in social development.

The result in Table 2.0 showed that, flow of business activities in the settlement had a positive coefficient (0.45) and was statistically significant at 5% level. This indicates that a unit increase in flow of business activities in the settlement would lead to increase in social development by 45%. This shows that flow of business activities in the settlement makes good available and also increase the number of traders which invariably reduce price of good and services and increase social development. This is in line with the result of Palei (2015), which shows that, flow of business activities leads to increase in social development.

The result in Table 2.0 showed that, access to road in reducing transportation cost had a positive coefficient (0.18) and was statistically significant at 5% level. This indicates that a unit increase in access to road in reducing transportation cost would lead to increase in social development by 18%. This shows that access to road significantly reduces transportation costs and facilitate efficient

movement of goods and services. This improves market access, reduces price of essential goods, and enhances social and economic development. The finding is in line with Adedeji, et al. (2014), showed that, access to road in reducing transportation cost led to increase in social development.

The result in Table 2.0 showed that, number of periodic markets had a positive coefficient (0.44) and was statistically significant at 5% level. This indicates that a unit increase in number of periodic markets would lead to increase in social development by 44%. This shows that periodic markets which occur on specific days in a week or month play a crucial role in social development. These markets enhance community interaction by bringing people together, fostering social development and cooperation. The finding is similar with that of Rahman (2014), number of periodic markets increase in social development.

The result in Table 2.0 showed that Employment generation had a positive coefficient (0.17) and was statistically significant at 10% level. This indicates that a unit increase in Employment generation would lead to increase in social development by 17%. The finding shows that increase employment not only boosts individual livelihoods but also strengthens the overall social fabric of a community. This is in line with Olufemi, et.al. (2013), employment generation increase social development.

5.0 Conclusion and Recommendation

It was concluded that, there is significant Effect of land use conversion on social development in the study area. It was also recommended that, increase employment not only boosts individual livelihoods but also strengthens the overall social fabric of a community, therefore it was recommended that, policy makers should take note of this in decision making. The periodic markets which occur on specific days in a week or month play a crucial role in social development therefore, the stakeholders should endeavour to increase the number of the periodic market for the improvement of social development.

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