



LAND USES CONFLICTS AND SUSTAINABLE DEVELOPMENT: THE CASE OF THE PERI-URBAN AREAS OF JOS

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Abstract

Land use conflict and environmental sustainability are increasingly becoming a source of concern in many countries. Thus, this study examined land use conflicts and sustainable development in the peri-urban areas of Jos with a view to ascertaining the nature and causes of land use conflicts for sustainable development. The sampled populations for the study were the practicing Estate Surveying and Valuation firms as well as property owners/occupants of some selected villages in the peri-urban areas classified based on the local governments into Jos North and Jos South Local Governments respectively. Data was collected through the administration of structured questionnaires and analysed using descriptive statistics, likert scale and Kruskawalis test. The study revealed that changed mix of urban & rural activities; nature of activities carried out on the land and conversion/mixed uses of land were the common forms of land use conflicts in the study areas. The result of the Kruskawalis test conducted on the nature and sources of land use conflicts in the peri-urban areas of Jos showed a p -value of <0.05 . The study further revealed that the major sources of land use conflicts inhibiting sustainable development includes disagreement over fundamental values; increased population and rapid development; lack of clear institutional arrangements amongst others. The study thus concludes that the competing interests in land uses if not properly monitored, managed and controlled may lead to severe land use conflicts and negative environmental impacts which threaten sustainable development of the peri-urban areas.

Key words: *Conflict, Land Use, Land Use Conflict, Peri-Urban Areas, Sustainable Development.*

Introduction

Land is a very fundamental and indispensable resource which is the most basic of all economic resources crucial to a nation's economic and social development (Alawode, 2013). Irrespective of the various classification of land use into residential, commercial, agricultural, engineering, recreational, industrial, transportation amongst others; land use defines the functionality of an area as well as the benefits accruable from complementary land uses. On this note, Adebayo (2009) asserted that land use is influenced by many factors which include socio-economic, physical, environment, technical, infrastructural, government policies, laws amongst others. Thus, land use is a complex entity as it involves competing public and private interest with attendant effects which may result into land use conflicts. For instance, large areas of land often used as pasture or cultivated under forest-fallow systems are now being shifted from smallholder food production to other uses such as residential, commercial, industrial amongst others without recourse to adequate land use balance, land use planning and sustainable development. In the course of this varied land use changes and activities; human livelihoods, economic activities and lives are affected thus influencing the overall growth, development and sustainability of the environment.

In ensuring sustainable environment and avoiding land use conflicts, several Government policies and land use control measures such as zoning; easement; building and site design regulations; comprehensive plans; land preservation or protection programs; developmental rights; agricultural and forest management policies; property tax programs; transportation planning regulations amongst other have been formulated and implemented; however, land use conflict and problems associated with environmental sustainability are increasingly becoming a frequent phenomenon.

Gefu and Kolawole (2002) also noted that land use conflict and environmental sustainability are increasingly becoming a source of concern in many countries where the competition for land use is becoming keener and fiercer, largely due to increasing human and animal populations. Furthermore, Odgaard (2006) noted that land is becoming a more conflict ridden resource because of its

relative scarcity and competition for varied uses in many parts of the continents which has resulted in land issues becoming a major policy in most countries as a result of the social and economic development of land. As a result of these pressures and rapid socio-economic change, land especially in the peri-urban area is becoming scarce and conflicts over land rights are also becoming very noticeable. This view was also corroborated by Achamyeleh (2017) who noted that the growth in urban population and market development have created mounting competition for land in the peri-urban areas.

Similarly, Xiao et al. (2006); Koomen and Stillwell (2007); Ravetz, Fertner and Nielson (2013) also noted that peri-urban areas have continued to experience incessant push and pull tendencies from the cities and the rural areas due to the strategic location, multi-functional territorial nature and activities. Thus, land use changes at the peri-urban area is a complex and dynamic process that involves both natural and human systems influencing land use decisions. However, it is important to note that peri-urban developments are usually casual, sporadic and haphazard and often results in dysfunctional rural-urban systems thus influencing land use conflicts and sustainability of the environment. It is a common scene to witness chaotic land-use patterns, strip commercial development and inadequate facilities in most peri-urban areas due to inadequate planning. Furthermore, some of its land uses and activities (e.g. derelict or grazing land, uneconomic farming lots etc.) can at best be described as wasted opportunities and inefficiencies in both use of resources and the practice of activities as a result of conflicting land uses which thus affects the sustainability of the peri-urban areas.

In the view of Buxton, Tieman, Bekessy, Budge, Mercer, Coote and Morcombe (2006), peri-urban areas are increasingly becoming centers of importance because the regions are the fastest growing in many cities and hold high strategic, spatial, social, economic and environmental significance. This view is also supported by the studies and researches of Mortimore (1993); Dung-Gwom (2001), (2004) and (2007)) amongst others. These studies noted that peri-urban areas pose significant obstacle for resource use management; a potential area of conflicts (social, economic, environmental); increased concerns on the sustainability of peri-urban areas and indeed the delicate balance between rural and urban areas as well as between the various land uses.

The goal of land use according to Barlowe, Adelaja and Babladelis (2013) is to enhance land use place quality which therefore attracts sustainable development. Similarly, Brown and Raymond (2007); Steiner (2008) also noted that the goal of land-use planning is to holistically and sustainably manage land use change in a community or region. However, land use conflict and environmental sustainability are affecting the achievement of same. Hence, such land uses must be properly planned to avoid conflicting land uses and ensure sustainable development. Thus, sustainable development according to the Brundtland (1987) report refers to the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. As related to the principle of sustainable development, the purpose of such land-use planning is to meet current and future societal and ecological needs while keeping conflicts bounded and functional. Therefore, UNESCO (2019) highlighted four (4) major dimensions to sustainable development which include society, environment, culture and economy. These four dimensions are in no doubt are intertwined and basically related to the importance of efficient land use planning and avoidance of land use conflicts.

There are different causes of land use conflicts which include increase in population which results to competing land use thereby creating a negative impact on other neighbouring land uses. Alston, Libecap and Mueller (2000) also noted that conflicting land uses are caused by disagreement over fundamental values; resource scarcity; social power imbalances; lack of clear institutional arrangements including property rights, among others. Furthermore, Von der Dunk, Gret-Regamey, Dalang, and Hersperger (2011) noted that conflicting land uses may also occur as a result of incompatible stakeholder's interests which can escalate into violence. In addition land use conflicts are majorly caused when incompatible land uses are located in proximity to each other. This is usually common at the rural areas and urban fringes as change in the social or physical environment (or both) is the catalyst for land use conflict.

However, irrespective of the various causes of land use conflicts, the importance of sustainability of the community is a matter that readily comes to mind. It must also be noted that land use conflicts may have varied impacts on pattern of housing development, land consumption, environmental sustainability amongst others. The impact of land use conflict on sustainable development is

never in doubt. This position was further corroborated by Von der Dunk, Grêt-Regamey, Dalang, and Hersperger (2011) who observed that land-use conflicts are a concern for landscape planners, especially in peri-urban areas as it affects sustainability of the environment. It was however noted that professionals in the built sector need to understand these conflicts better in order to make optimal decisions on land-use allocations and conflict management. However, such conflicts are complex entities and a review of the causes, consequences and land use conflicts have become important issues regarding sustainability.

In the view of Paoli (2008); Forester (2013) and Griggs et al. (2014), land use conflicts are not necessarily violent or even entirely negative; land use conflicts can be catalysts for improvements in land governance and for creative politics. Even though almost all new urban based developments and changes are concentrated in the peri-urban areas, little has been investigated about land use conflicts on sustainable environment. This therefore forms the prerogative of this study using the peri-urban areas of Jos as a case study.

Literature Review

Concept of Land Use Conflict

Deininger and Castagini (2005) asserted that land use conflicts in many parts of the developing world can be traced to disputes over land ownership and land use. Thus, there are differing definitions of land use conflict. Land use conflicts are competing claims over land that are closely intertwined with broader inter-community struggles or disagreements; have a wide political significance or connotation; are intractable; fall far outside existing legal frameworks; or reflect competing interest of such breadth and depth that they cannot easily be resolved through the existing dispute resolution mechanisms. According to Wehrmann (2005), land use conflict is a social fact in which at least two parties are involved, the roots of which are different interests over the property rights to land: the right to use the land, to manage the land, to generate an income from the land, to exclude others from the land, to transfer it and the right to compensation for it. Land use conflict therefore, can be understood as a misuse, restriction or dispute over property rights to land. Furthermore, Mann and Jeaneaux (2009) noted that land-use conflicts have some inherent characteristics that make them difficult to deal with. Such characteristics are often influenced by forces like globalization, broader societal trends, demographic changes; land

uses decisions amongst others which may substantially differ in varied local institutional contexts.

In another definition, Von der Dunk *et al*, (2011) defined conflicting land uses as situations in which involved parties of constituents have incompatible interests concerning the use of a certain parcel of land. Queensland Farmer's Federation (2013) also defined land use conflicts as situations where incompatible land uses are located in proximity to each other and occurs in rural areas where uses such as residential or resource extraction are located either adjacent to or amongst active farming activity. Similarly, Andre *et. al* (2014) noted that conflicts arise from changes or projects of change, perceived by some actors as contrary to their interests or their wishes. The material expression of changes at the origin of conflicts pertains to several categories:

- i. Construction, deterioration or destruction of property, a landscape or infrastructure;
- ii. Creation of a new production facility or expansion of an activity;
- iii. Emission of external negative effects (diffusion pollution, odors, water drainage);
- iv. Development of a property or piece of land;
- v. Access issues (restriction/exclusion, or opening/easement).

According to Hersperger, Ioja, Steiner and Tudor (2015) land-use conflicts are defined as situations in which involved parties or constituents have incompatible interests concerning the use of some certain parcel of land.

Concept of Peri-Urban Area

United States Agency for International Development (USAID, 1993) described peri-urban areas as areas characterized by uncertain land tenure, inferior infrastructure, low incomes and lack of recognition by formal governments. Ayorinde (1994) in a study of peri-urban areas in Ibadan , Nigeria pointed out that peri-urban areas contain substantial but continuous areas of urban development's mixed with stretches of more extensive and traditional rural areas utilized for agriculture and forestry. In reality, they represent spaces with undefined boundaries (Burrough and Frank, 1996). In the view of Tacoli (1998), peri-urban areas represent very complex territorial spaces from the economic, environmental and social viewpoints, particularly in relation to their proximity

and mutual dependence with cities and rural areas. Valentini (2000) defined peri-urban areas as areas along the urban- rural gradient, inside of which transitions and changes in equilibrium and relationships can be observed.

According to Pasquini and Maconachie (2005) studies on peri-urban areas have been influenced by the optimistic or the pessimistic schools. The optimistic school view peri-urban areas as capable of evolving in a sustainable way promoting urban and rural livelihoods and coping with the pressures and dynamics of population and land use changes. The pessimists however argue otherwise. Using Malthusian gloom and doom analysis, they argue that peri-urban areas lead to progressive degradation of the environment, collapse of institutions and put unnecessary pressure on natural and human resources. In addition to the Malthusian gloom and doom analysis, a basic characteristic of peri-urban areas is that it is an amorphous and mobile site for the interaction of various social, economic and cultural processes and interlinkages between the rural and the urban.

Murgante and Cansas (2007) noted that the concept of “peri-urban” is subject to numerous interpretations by planners who are unable to offer un-ambiguous criteria for the identification and territorial delimitation of these spaces while Nagot (2008) defined the peri-urban area as a district undergoing demographic changes, characterized by the de-concentration of population and jobs from the city to sparsely populated areas.

Literatures on Land Use Conflicts and Sustainable Development

[Aguila \(2008\)](#) carried out a research on peri-urbanization, illegal settlements and environmental impact in Mexico City. The study adopted the methodology of the dynamics and main patterns of urbanization in the Preservation Zone, the description of planning norms, and a precise measurement of illegal settlements and concluded that peri-urban process shows, a marked environmental damage, lack of effectiveness of planning norms and of increasing living standards of the poor, all of which show an ineffective urban governance that does not contribute to sustainability in the Preservation Zone and in the city in general. Similarly, Mann and Jeanneaux (2009) in the study of the approaches for understanding conflicting land uses to improve rural planning and management observed that land-use conflicts reveal the contemporary evolution of rural areas. The study presented two examples of conflicting land uses occurring in

rural settings: conflicts related to the residential environment and to outdoor recreation. The studies identified the importance of mitigating land use conflicts and ensuring environmental sustainability in the peri-urban areas thus necessitating a study in Jos, Nigeria.

In another European study, Koster and Rouwendal (2013) examined the impact of mixed land use on residential property values in contemporary European urban planning policies. Using semi parametric estimation techniques, the study demonstrated that a diverse neighbourhood is positively valued by households. Furthermore, Tudor, Iojă, Hersperger, Pătru and Patru-Stupariu (2013) assessed the attitudes of urban residents with respect to compatibility of residential land use and Cemeteries in Bucharest, Romania. The study adopted the use of cadastral plans with closed-ended and semi-closed questionnaire. Logistic regression was used to determine the relationship between socio-demographic variables and the resident's perceptions of the cemetery location. The results point out important physical and psychological interactions between people and their local environment. Knowledge about these interactions can be used by local authorities to understand urban conflicts and provide useful insights for improving urban sustainability. Also, Appiah, Bugri, Forkuo and Boateng (2014) examined the effects of determinants of peri-urbanization and land use change patterns in peri-urban Ghana peri-urbanization on peri-urban land use change patterns, using a binary logistic regression model, in the Bosomtwe district of the Asante region, Ghana. The research revealed that the main causes of peri-urbanization in the Bosomtwe district were those that are driven by population and infrastructure expansion; the availability of excess land for which reason people are moving towards the district in speculation for land, ostensibly for residential and recreational purposes; and the perceived availability of social amenities that attract people for settlement into the district. Emad (2014) also researched on the chronological approach of the evolution of GIS as a land use planning conflict resolution tool. The research using a multi-actor as the context of land use planning process revealed that land conflicts can be attributed to two main sources; disagreement on facts referred to as "cognitive conflict" and disagreement regarding values referred to as "interest conflict". The research revealed that there is a reciprocal relation between the GIS techniques and the level and type of conflict in the planning process.

Research Methodology

The research design is a survey research and the data was collected via the administration of questionnaires to the target population which comprised of practicing Estate Surveying and Valuation firms within the peri-urban areas of Jos as well as property owners in some selected peri-urban areas of Jos which were classified into Jos North and Jos South respectively. The sample frame of practicing Estate Surveying and Valuation firms within the peri-urban areas of Jos was derived from the online directory of the Nigerian Institution of Estate Surveyors and Valuers (2020) which reveals that there are 46 (forty-six) firms while the sampling frame of property owners in the stated peri-urban areas of Jos was derived from the estimated population of the property owners in the study areas based on the indices of growth rate and the National Housing Population Census of 2006. Thus, for the purpose of this study, the 46 practicing Estate Surveying and Valuation firms in Jos as well as the estimated occupants of some villages which in Jos North (Naraguta, Bida Bidi, Dong) and Jos South (Zaramaganda, Rantya-Gyel, Angwan Doki and Shaka) based on a sample size reduction formula were considered as the sample size. Structured questionnaires were randomly administered on firms to elicit information on land use conflicts and sustainable development in the peri-urban areas of Jos. Questionnaires were sent out to each of the respondent's, thus a total of 46 questionnaires were sent out to the firms of which a total of 42 representing 91.30%; while 1018 out of the 1162 questionnaires distributed to the property owners in Jos North was retrieved representing 87.61% while 1267 out of the 1553 questionnaires distributed to the property owners in Jos South was retrieved representing 81.85% were completed and retrieved which was then used for the analysis. Descriptive statistics, likert scale and Kruskawalis test were employed to analyze the data.

Data Presentation

Table 1: Major Land Use Conflicts amongst Land Uses In the Peri-Urban Areas of Jos

Major Land Use Conflicts In the Peri-Urban Areas of Jos	Estate Surveyors & Valuers			Occupants of Jos North			Occupants of Jos South			Kruskal Wallis Test		
	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank	Chi-Square	Df	Asymp. Sig

Residential & Commercial land use conflict	3.7632	1.05098	4 th	4.5511	.49763	2 nd	4.0592	.67485	8 th	311.213	2	.000**
Residential & industrial Land use conflict	3.1842	1.06175	10 th	3.3988	.80074	14 th	3.7435	.60254	10 th	106.649	2	.000**
Residential & Religious land use conflict	2.9737	.85383	13 th	4.2004	.81355	5 th	4.6298	.53870	2 nd	269.525	2	.000**
Residential & public land use conflicts	3.0789	.99679	11 th	4.1503	.47763	7 th	3.4870	.64979	11 th	603.149	2	.000**
Residential & other land use such as cemeteries, prisons etc land use conflict	3.7368	.97770	5 th	3.8487	1.06278	11 th	4.1444	.54248	5 th	27.253	2	.000**
Residential & agricultural land use conflict	4.3947	.75479	2 nd	4.7495	.43351	1 st	4.6582	.47448	1 st	28.724	2	.000**
Industrial & commercial land use conflict	3.3947	1.00107	7 th	2.4528	1.16075	15 th	3.8295	.56011	9 th	831.830	2	.000**
Industrial & agricultural land use conflicts	3.0000	.86992	12 th	3.9980	1.18413	8 th	4.1152	.57404	6 th	52.833	2	.000**
Industrial & agricultural land use conflict	3.3158	.73907	9 th	3.8988	.94415	10 th	4.3725	.54073	3 rd	182.682	2	.000**

Commercial & public land use conflicts	3.5526	.82846	6 th	4.1513	.72645	6 th	3.3165	.66632	14 th	575.344	2	.000**
Recreation & industrial land use conflict	2.5789	1.00355	15 th	3.6994	.64112	12 th	3.4594	.69109	12 th	86.729	2	.000**
Commercial & agricultural land use conflicts	3.3684	1.07606	8 th	4.5000	.59206	3 rd	3.4041	1.24588	13 th	502.322	2	.000**
Recreational & agricultural land use conflicts	2.9211	.85049	14 th	4.2505	.53687	4 th	2.7774	.96020	15 th	1172.442	2	.000**
Agricultural & public land use conflicts	4.1579	.59395	3 rd	3.9018	.69989	9 th	4.2534	.76952	4 th	127.971	2	.000**
Other nature of land use conflicts	4.5263	.60345	1 st	3.6012	.86109	13 th	4.0608	.98340	7 th	168.664	2	.000**

Source: field survey, 2020

The study examined the major land use conflicts in the peri-urban areas of Jos. The various land use conflicts considered were based on physical identifications of such land use conflicts based on the reconnaissance and pilot survey initially carried out in the areas to ascertain the nature and types of land use conflicts in the study areas. As revealed in table 1, majority of the respondents Estate Surveying and Valuation firms opined to the availability of other land use conflicts which was ranked 1st with a mean score of 4.5263 implying that most of the land use conflicts in the area may not be directly related to land use conflicts between uses alone. Residential and agricultural land use conflicts; agricultural and public land use conflicts were ranked 2nd and 3rd respectively with mean scores of 4.3947 and 4.1579. The occupants of Jos North and Jos South also opined to conflicts arising between residential and agricultural land uses as the major land use conflicts in the areas with mean scores of 4.7495 and

4.6582 which was ranked 1st respectively. Residential and commercial land use conflicts was ranked 2nd with a mean score of 4.5511 by the occupants of Jos North while residential and religious land use conflict was ranked 2nd by the occupants of Jos South. The research further revealed that the residential and agricultural land use conflicts were as a result of the large conversions and change of use of agricultural land to residential land uses. The residential and commercial land use conflicts were related to the multiple occupations of properties while residential and religious land use conflicts were related to the sighting of religious centers amidst residential properties thus creating an unhealthy and friendly environment. Kruskawalis test of difference showed that there are significant differences in the opinion of the respondents based on the major land use conflicts in the peri-urban areas of Jos having a significant value of less than 0.05.

Table 2: Nature and Source of Land Use Conflicts In the Peri-Urban Areas of Jos

Nature and Source of Land Use Conflicts In the Peri-Urban Areas of Jos	Estate Surveyors & Valuers			Occupants of Jos North			Occupants of Jos South			Kruskal Wallis Test		
	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank	Chi-Square	Df	Asymp. Sig
Ownership of land disputes due to lack of land registration	3.9474	1.11373	15 th	4.1994	.67874	10 th	3.8856	1.00567	17 th	43.466	2	.000**
Multiple sales/allocations of land	4.0526	.61281	11 th	3.9008	.76872	16 th	3.8564	.68489	18 th	6.065	2	.048*
Land evictions	3.2895	.69391	20 th	3.8507	.65424	17 th	3.8556	.59259	19 th	22.746	2	.000**
Effective planning permission	4.1053	.64889	10 th	4.4008	.49030	5 th	4.3157	.62195	5 th	11.448	2	.003**

Disputes over the payment for using/buying land	3.9211	.94101	16 th _h	3.2986	.78156	19 th _h	4.0600	.71513	13 th _h	450.483	2	.000**
Illegal/improper uses of land	4.5789	.50036	4 th	4.0982	.88923	13 th _h	4.3441	.71431	4 th	45.480	2	.000**
Unauthorized sales of common or collectively owned property	4.1579	.75431	7 th	3.9037	1.13346	15 th _h	4.2289	.68129	9 th	22.112	2	.000**
Residential & commercial landlord-and-tenant disputes	3.4737	.89252	19 th _h	3.0010	.89520	20 th	4.0568	.58138	14 th _h	816.759	2	.000**
Leasing, subleasing and sales	4.2895	.73182	6 th	4.1012	.70017	12 th _h	3.8035	.70993	21 st _t	105.256	2	.000**
Conversion and mixed uses of land	4.6842	.47107	3 rd	4.2515	.62213	8 th	4.5998	.49012	2 nd	187.052	2	.000**
Nature of activities carried out on the land	4.7105	.45961	2 nd	4.5501	.58994	3 rd	4.3710	.58930	3 rd	66.926	2	.000**
Sub division of land	4.0263	.88491	12 th	3.9509	.74042	14 th	4.2865	.56420	6 th	125.937	2	.000**
Land fragmentation and land grabbing	3.8684	.87522	18 th	4.5511	.49763	2 nd	3.9132	.64852	16 th	511.398	2	.000**
Changed mix of urban &	4.7895	.41315	1 st	4.2004	.60082	9 th	4.2021	.66762	11 th	34.029	2	.000**

rural activities												
Increased economic activities	4.1579	.97333	7 th	4.5992	.58368	1 st	4.2865	.45231	6 th	236.447	2	.000*
Population Growth	4.0000	1.23025	13 th	4.3988	.48990	6 th	3.8516	.90291	20 th	242.833	2	.000*
Highest and Best use of land	4.5789	.59872	4 th	4.1532	.85076	11 th	4.2581	.76794	8 th	14.607	2	.001**
Disagreement over fundamental values	4.1316	.70408	9 th	3.8016	.87121	18 th	4.6290	.63573	1 st	586.322	2	.000*
Resource Scarcity	4.0000	1.18550	13 th	4.3497	.65439	7 th	3.9708	.73607	15 th	149.569	2	.000*
Lack of clear institutional arrangement	3.9211	1.17131	16 th	4.4489	.49763	4 th	4.1697	.60834	12 th	116.699	2	.000*
The Property Rights system	3.2368	.91339	21 st	3.0000	.77574	21 st	4.2289	.68013	9 th	1002.670	2	.000*

Source: field survey, 2020

Table 2 showed the respondents' opinion on the nature and sources of land use conflicts in the peri-urban areas of Jos asides land use conflicts between land uses. Majority of the respondent Estate Surveying and Valuation firms opined to the major nature of land use conflicts to include changed mix of urban & rural activities (4.7895); nature of activities carried out on the land (4.7105); conversion and mixed uses of land (4.6842) which were ranked 1st, 2nd and 3rd respectively. The Illegal/improper uses of land and Highest and Best use of land were both ranked 4th with a mean score of 4.5789. The occupants of Jos North opined to the major nature of land use conflicts to include increased economic activities (4.5992); land fragmentation and land grabbing (4.5511); nature of activities carried out on the land (4.5501); lack of clear institutional arrangement (4.4489) and effective planning permission (4.4008) which were

ranked 1st, 2nd, 3rd, 4th and 5th respectively. The occupants of Jos South on the other hand opined to the major nature and of land use conflict to include disagreement over fundamental values (4.6290); conversion and mixed uses of land (4.5998); nature of activities carried out on the land (4.3710); illegal/improper uses of land (4.3441) and effective planning permission (4.3157) which were ranked 1st, 2nd, 3rd, 4th and 5th respectively. The results of the Kruskawalis test of difference showed a significant difference in the opinions of Estate Surveying and Valuation Firms, occupants of Jos North and the occupants of Jos South with significant level of less than 0.05 on the nature and sources of land use conflicts in the peri-urban areas of Jos.

Table 3: Causes of Land Use Conflicts inhibiting Sustainable Development

Causes of Land Use Conflicts inhibiting Sustainable Development	SA	A	UD	DA	SDA	Mean	Std. Dev	Rank
Disagreement over fundamental values	40(95.2)	2(4.8)	-	-	-	4.9524	.21554	1 st
Increased Population and Rapid development	26(61.9)	12(28.6)	4(9.5)	-	-	4.5238	.67130	2 nd
Lack of clear institutional arrangements	14(33.3)	28(66.7)	-	-	-	4.3333	.47712	3 rd
Economic Impacts	10(23.8)	32(76.2)	-	-	-	4.2381	.43108	4 th
Property rights	8(19.0)	24(57.1)	10(23.8)	-	-	3.9524	.66083	5 th
Resource scarcity	8(19.0)	18(42.9)	16(38.1)	-	-	3.8095	.74041	6 th
Increased mobility of production factors (such as: capital, labour & technology)	6(14.3)	20(47.6)	12(28.6)	4(9.5)	-	3.6667	.84584	7 th
Social power imbalances	2(4.8)	20(47.6)	20(47.6)	-	-	3.5714	.59028	8 th
Societal demands	8(19.0)	8(19.0)	22(52.4)	4(9.5)	-	3.4762	.91700	9 th
Growth opportunities and uneven spread of activities	-	32(76.2)	2(4.8)	4(9.5)	4(9.5)	3.4762	1.0178	10 th
Environmental impacts	8(19.0)	4(9.5)	26(61.9)	4(9.5)	-	3.3810	.90937	11 th
Culture and way of life	6(14.3)	6(14.3)	20(47.6)	10(23.8)	-	3.1905	.96873	12 th

Where SA: Strongly Agree: A: Agree: UD: Undecided: DA: Disagree: SDA: Strongly Disagree

Source: field survey, 2020

The achievement of a sustainable environment is been inhibited by various factors; one of such factors especially with respect to Jos the study area is land use conflicts. From the research, it was revealed that the major sources of land

use conflicts inhibiting sustainable development includes disagreement over fundamental values which was ranked 1st with a mean score of 4.9524. Increased population and rapid development was ranked 2nd with a mean score of 4.5238; Lack of clear institutional arrangements was ranked 3rd with a mean score of 4.333; economic impacts was ranked 4th with a mean score 4.2381 while property rights was ranked 5th with a mean score of 3.9524.

Table 4: Land Use Conflicts Control Tools and Programmes

Land Use Conflicts Control Tools & Programmes	SA	A	UD	DA	SDA	Mean	Std. Dev	Rank
Comprehensive Plans	39(92.9)	3(7.1)	-	-	-	4.9286	.26066	1 st
Agriculture and Forest Management Policies	37(88.1)	5(11.9)	-	-	-	4.8810	.32777	2 nd
Land Preservation or Protection Programmes	31(73.8)	11(26.2)	-	-	-	4.7381	.44500	3 rd
Zoning	35(83.3)	3(7.1)	3(7.1)	1(2.4)	-	4.7143	.70834	4 th
Developmental Rights	5(11.9)	33(78.6)	4(9.5)	-	-	4.0238	.46790	5 th
Transportation Planning Legislations	2(4.8)	33(78.6)	7(16.7)	-	-	3.8810	.45276	6 th
Property Tax Programmes	12(28.6)	7(16.7)	23(54.8)	-	-	3.7381	.88509	7 th
Building and Site Design	2(4.8)	25(59.5)	15(35.7)	-	-	3.6905	.56258	8 th
Easement	2(4.8)	15(35.7)	25(59.5)	-	-	3.4524	.59274	9 th

Where SA: Strongly Agree: A: Agree: UD: Undecided: DA: Disagree: SDA: Strongly Disagree

Source: field survey, 2020

The research further revealed that several land use conflict control tools and programmes have been implemented by Governments towards ensuring sustainable land uses. However, most of the policies and programmes were not completed implemented. The land use control tools majorly adopted include comprehensive plans (4.9286); agriculture and forest management policies (4.8810); land preservation or protection programmes (4.7381); zoning (4.7143) and developmental rights (4.0238) which have been ranked 1st, 2nd, 3rd, 4th and 5th respectively.

Table 5: Impacts on Land Use Conflicts on Sustainable Development

Impacts on Land Use Conflicts on Sustainable Development	SA	A	UD	DA	SDA	Mean	Std. Dev	Rank
Enhance and positive impacts of land use	34(81.0)	8(9.0)	-	-	-	4.8095	.39744	1 st
Helps to Improve quality of life	28(66.7)	6(14.3)	6(14.3)	2(4.8)	-	4.5714	1.06251	2 nd
Provides Incentives to shaping the behaviour of land owners	22(52.4)	20(47.6)	-	-	-	4.5238	.50549	3 rd
delicate balance between rural and urban areas	24(57.1)	12(28.6)	6(14.3)	-	-	4.4286	.73726	4 th
Coordinates Conflicting land use policies	10(23.8)	24(57.1)	8(19.0)	-	-	4.0476	.66083	5 th
Enhance place quality to attract sustainable economic development	4(9.5)	28(66.7)	10(23.8)	-	-	3.8571	.56618	6 th
Ensuring optimal mix of land uses	4(9.5)	26(61.9)	12(28.6)	-	-	3.8095	.59420	7 th
efficient Land Use and Healthy environment	4(9.5)	10(23.8)	28(66.7)	-	-	3.4286	.66783	8 th
Ensure stakeholders have compatible interests related to land areas that result in positive effects	6(14.3)	6(14.3)	28(66.7)	2(4.8)	-	3.3810	.79487	9 th
control land use and healthy environment	2(4.8)	6(14.3)	28(66.7)	6(14.3)	-	3.0952	.69175	10 th

Where SA: Strongly Agree: A: Agree: UD: Undecided: DA: Disagree: SDA: Strongly Disagree

Source: field survey, 2017

The study further examined the impacts of the land use conflicts on sustainable development and the results showed that land use conflicts when controlled and managed could result into enhance and positive impacts of land use (4.8095); improves the quality of life (4.5714); provides incentives to shaping the behaviour of land owners (4.4238); ensures delicate balance between rural and

urban areas (4.4286) and coordinates conflicting land use policies (4.0476) which has been ranked 1st, 2nd, 3rd, 4th and 5th respectively.

Conclusion

Land use conflicts have significant impacts on development and are considered critical for sustainable development in developing countries like Nigeria. The rapid rates of urbanization; urban transformation; neglects in agriculture and conversion of agricultural land uses have resultant impact on land use thus resulting in land use conflicts and affecting the sustainability of the environment. This study examined the various types of land use conflicts; nature and source of land use conflicts in the peri-urban areas of Jos; causes of land use conflicts inhibiting sustainable development as well as the land use conflicts tools/programmes and impact of land use conflict on sustainable development. It must be noted that competing interests in land uses if not properly monitored, managed and controlled may lead to severe land use conflicts and negative environmental impacts which threaten sustainable development of the peri-urban areas. Therefore, the peri-urban areas which have been described as one of the fastest developing settlements in Nigeria, require adequate land use planning in other to ensure land use balance and ensure sustainable development.

Recommendations

Base on the conclusion above, this study recommends the followings:

- i. The government should ensure appropriate implementation of policies so as to ensure the sustainable development.
- ii. Optimization of the spatial pattern of land development and ensure adequate implementation of land use conflict control tools.
- iii. Delineate control boundaries land uses and ensure sustainable development.
- iv. Identification of the key land use conflicts and mitigation of same.
- v. Control of the extensive development of land,
- vi. Implementation of conservative and sustainability principles.
- vii. Land use planning and regulations should be ensured in other to mitigate the problems of conflicting land uses.

REFERENCES

- Achamyeleh, G. A. (2017). Urbanization and the Struggle for Land in the Peri-Urban Areas of Ethiopia. *Bahir Dar University*.
- Adebayo, M. A. (2009) Impact of Urban Land Use Changes on Property Values in Metropolitan Lagos. *The Social Sciences* 4(1), 111-117, 2009. ISSN: 1818-5800
- Alawode, O. O. (2013) Determinants of Land Use Conflicts Among Farmers in South Western Nigeria. *Journal Research in Peace, Gender and Development (JRPGD)* 3(4) pp. 58-67, June, 2013 Available online <http://www.interestjournals.org/JRPGD>
- Alston, L. J., Libecap, G. D., and Mueller, B. (2000) Land reform policies, the sources of violent conflict, and implications for deforestation in the Brazilian Amazon. *Journal of Environmental Economics and Management*, 39(2), 162–188.
- Andre, C., J.P. Platteau. et. al (2014). Land relations under unbearable stress: Rwanda caught in the Malthusian trap. *Journal of Economic Behavior and Organization*, vol. 34 (1): 1-4.
- Appiah, D. O., Bugri, J.T., Foruko, E. K. and Boateng, P. K. (2014) Determinants of Peri-urbanization and Land Use Change Patterns in Peri-Urban Ghana. *Journal of Sustainable Development*; 7(6), 2014. ISSN 1913-9063 E-ISSN 1913-9071.
- Ayorinde, D. (1994) Controlling Development at the Urban Fringe; A Case Study of Ibadan, Nigeria. In *Urban Management and Urban Violence in Africa*, 2(Ed) by I. O. Albert, J. Adisa, T. Agboola and G. Haurault, IFRA-Ibadan.
- Barlowe, Raleigh & Adelaja, Adesoji & Babladelis, Paul. (2013). Land Resource Management. *Economic Foundations and New Directions*.
- Brown, G. and Raymond, C. (2007) The Relationship Between Place Attachment and Landscape values: Toward Mapping Place Attachment. *Applied Geography*, 27(2), 89–111.
- Brundtland, G. (1987). Report of the World Commission on Environment and Development: Our Common Future. *United Nations General Assembly document A/42/427*.
- Burrough, P. A., Frank, R. (1996), A Principles of Geographical Information Systems, *Oxford University Press, New York*.
- Buxton M, Tieman G, Bekessy S, Budge T, Butt A, Coote M (2007) Peri-urban case study: Bendigo Corridor. RMIT University, *Melbourne*.
- Deininger, K., and R. Castagnini. (2005) Incidence and impact of land conflict in Uganda. *Journal of Economic Behavior and Organization*, forthcoming.
- Dung-Gwom, J. Y. (2004). The Nature of Peri-Urban Developments in Jos, *Nigeria*.
- Dung-Gwom, J.Y (2001), Delay In Obtaining Planning Permission By Private Developers In Jos. *Journal of Environmental Sciences Vol 5(1)*, 103-124.
- Dung-Gwom, J.Y. (2007). Urban renewal in Jos Bukuru Metropolis, *Paper Presented At The Nigerian Institution Of Estate Surveyors And Valuers Mcpd Workshop, On October 25th 2007*.
- Emad, D. (2014) The Evolution of GIS as a Land Use Planning Conflict Resolution Tool: A Chronological Approach. *American Journal of Geographic Information System* 2014, 3(1): 38-44 DOI: 10.5923/j.ajgis.20140301.04.
- Forester, J., 2013, Planning in the face of conflict: the surprising possibilities of facilitative leadership. *APA Planners Press - Chicago*. 288 pages.
- Gefu, J. O. and Kolwole, O. (2002) Land Tenure Systems in Nigeria. (pp. 27–32), *Kaduna: LandNet Nigeria*.

- Griggs, S., Norval, A. J. and Wagenaar, H., 2014, Practices of Freedom. *Decentred Governance, Conflict and Democratic Partic.*
- Hersperger, A. M., Ioja, C., Steiner, F. and Tudor, C. A. (2015) Comprehensive Consideration Of Conflicts In The Land-Use Planning Process: A Conceptual Contribution. *Carpathian Journal of Earth and Environmental Sciences, November 2015,10 (4) p. 5 – 13.*
- Koomen, E. and Stillwell, J. (2007). Modelling land use change: Theories and methods. In E. Koomen, J. Stillwell, A. Bakema and H. Scholten (Eds.), *Modelling Land-Use Change: Progress and Applications (pp. 1-21). Dordrecht, The Netherlands: Springer.*
- Koster, H. R., and Rouwendal, J. (2013). Mixed Urban Land Use. *Regional Science and Urban Economics, 43(2), 352-366.*
- Mann, C. and Jeanneaux, P. (2009) Two Approaches for Understanding Land-Use Conflict to Improve Rural Planning and Management. *Journal of Rural and Community Development 4, 1 (2009) 118–141.*
- Mortimore, M. (1993) The Intensification or Peri-Urban Agriculture in the Knao Close Settlement Zone 1964-1986. In Turner B. L.G., Hyden R. W. Kates (Eds) *Population Growth and Agricultural Change in Africa. University of Pres. Of Florida, Gainville 358-400.*
- Nigerian Institute of Estate Surveyors and Valuers (NIESV) (2020) NIESV Online Directory.
- Odgaard, R. (2006). Scrambling for land in Tanzania: processes of formalisation and legitimisation of land rights. Securing Land Rights in Africa. T. A. Benjaminsen and C. Lund. London, Frank Cass: 71-88.
- Paoli, J. C. (2008). Typologie des conflits sur l'espace en fonction des institutions regulatrices: essai sur un echantillon relate par la presse quotidienne regionale en corse. In: *Territoires de conflits. Analyses des mutations de l'occupation de l'espace. (T. Kirat, A. Torre, eds.), L'Harmattan. 253-272.*
- Pasquini, M.W & Maconachie, R (2005). Peri-urban systems under stress in Jos and Kano, Nigeria? New perspectives on source management and degradation. In: Parrot, L. (ed) *Proceedings of the International Workshop on Agriculture and Urban Developments in Central Africa, University of Yaoude, Cameroon*
- Queensland Farmers' Federation (2013). Land Use Conflict. *Planning for Healthy Agriculture.*
- Ravetz J, Christian F, and Thomas S. N. (2013). The Dynamics of Peri-Urbanization.
- Steiner, F. (2008). Identifying Environmental Constraints to and Opportunities for Development. In *Land Market Monitoring for Smart Urban Growth, edited by Gerrit J. Knaap. Cambridge, MA: Lincoln Institute of Land Policy.*
- Tacoli, C, (1998). Rural-urban Interactions: a Guide to the Literature, *Environment and Urbanization, 10 (1): 147-166.*
- Tudor, C. A., Ioja, I. C., Hersperger, A. and Patru-Stupairu, I. (2013). Is the residential land use incompatible with cemeteries location? Assessing the attitudes of urban residents. *Carpathian Journal of Earth and Environmental Sciences, May 2013, Vol. 8, No. 2, p. 153 – 162.*
- UNESCO (2019). Implementing Sustainable Development Goal 11 by connecting sustainability policies and urban planning practices through ICTs. *UNHABITAT.*
- USAID (1993). Property Rights And Resource Governance. *London.*
- Von der Dunk, A., Gret-Regamey, A., Dalang, T., and Hersperger, A. M. (2011). Defining a typology of peri-urban land-use conflicts – A case study from Switzerland. *Landscape and Urban Planning, 101(2), 149–156.*

- Wehrmann, B. (2005) *Land Conflicts: A practical Guide to Dealing with Land Disputes. FP-Werbung Frido Flade GmbH & Co. KG Elisabethstr. 34 80796 München, Germany.*
- Xiao, J., Shen, Y., Ge, J., Tateishi, R., Tang, C. and Liang, Y. (2006). Evaluating urban expansion and land use change in Shijiazhuang, China by using GIS and remote sensing. *Landscape and Urban Planning.* 75, 69-80.
<http://dx.doi.org/10.1016/j.landurbplan.2004.12.005>