VOL. 05 NO. 4,
AUGUST, 2024
E-ISSN 3026-9210
P-ISSN 3026-815X

African Scholar Publications & Research International
www.africanscholarpub.com

Journal of Built Env. & Geological Research (JBEGR)

Land Information Generation in Sub-Saharan Africa: A Dual Perspective

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Abstract

The study examined land information generation in Ondo State, Southwest Nigeria. The study adopted a survey research design. A cross-sectional survey of four hundred and forty-one (441) respondents comprising ten (10) respondents from holders of land information within the public and four hundred and thirty-one (431) private sector respondents purposively drawn from the study area. Two hundred and thirty-seven (237) questionnaires were retrieved, representing 53.74% of the respondents sampled. Data obtained from respondents were analysed using descriptive statistical tools. Analysis of the government agencies' respondents' opinions revealed that government and private organisations hold forms of land information other than cadastral, and survey maps ranked 1st with a mean value of 8.33. A lot of government personnel are still not aligned with modern land information systems, ranked 2nd with a mean value of 7.89. The information retrieval system is at variance with the exponential increase in demand for land due to population growth and urbanisation, ranked 3rd with a mean value of 6.78. Furthermore, the privately owned organisations that hold land information revealed that the information retrieval system is at variance with the exponential increase in demand for land due to population growth and urbanisation, as it ranked 1st with a mean value of 7.18 out of 10. Land information still needs to be updated, ranked 2nd with a mean value of 6.81 out of 10; land information is well organised and managed, ranked 3rd with a mean value of 6.65. The study, therefore, recommends collaboration between government agencies and privately owned organisations in charge of land in the study area to further

foster the development of encompassing land information that will be useful for all.

Keywords Land, Land Information, Land Information Generation, Government Agencies, Private Organisations

Introduction

Over time, land has remained important to humans as it provides a base for all activities (Nubi & Ajoku, 2011). Its relevance to man cannot be over-emphasized. Therefore, absolute human dependence on land requires reliable and accurate information on lands within a geographical area (Stanfield & Licht, 2009; Adiaba, 2014). Igwe, Ndubuisi-Okoh, Akuma, & Okoche (2015) observed that land information, like all other forms of information, is vital to humans. For instance, Tula and Geleta (2019) asserted that demand for land has exponentially increased in major Ethiopian cities, thereby posing a need for reliable, accurate, and current information. Land information is an integral part of both government organisations and private individuals (Abbas, Ben-Yayork, & Muhammad, 2014). Adiaba (2014) noted that it serves as the lifeblood of the real estate market. Land information availability, as observed by Kurwakumire (2014), enhances the productivity of the urban real estate market in crucial decision-making within developed and developing countries alike. Land information functions optimally with a well-defined system that provides adequate support for economic, environmental, governance, and social processes to aid better decision-making (Dawidowicz & Źróbek, 2017).

Enemark (2001) and Wayumba (2017) observed that land information has remained an essential component for sustainable development across the globe. In the developed world, progress has been made in designing an effective land information system that is able to cope with the complexities of the land market. However, land information in developing countries especially, the Sub-Saharan Africa is bedeviled with a variety of problems ranging from information asymmetry amongst the users and decision-makers (Adiaba, 2014) to the inability to cope with the demands for land (Enemark, Wallace, Williamson, & Rajabifard, 2009; Augustinus, 2010; Aydinoglu & Bovkir, 2017). Previous efforts to create a hub of land information across the state in Nigeria have continuously failed, resulting in dispersed and uncoordinated land information across different organisations. This has compounded inefficient and unreliable access to well-harmonized information

on land. These significant problems have continually made land transactions and real estate practices suffer huge setbacks and further prevented or, at best, reduced the chances of realizing anticipated investment objectives. Furthermore, the problem of land information monopoly by various agencies holding land information has dramatically impaired the performance hoped for in the land market.

Land information systems in Sub-Saharan African countries such as Nigeria are epileptic and experiencing increasingly more problems in supplying excellent data to the general populace (Zeng & Cleon, 2018). Governments of various Sub-Saharan African countries, Nigeria inclusive, are bedeviled with insufficient land information emanating from a low rate of recorded land registration that will probably take several centuries to finish (UN-Habitat, 2012; and Adiaba, 2014). Fourie and Nino-Fluck (1999) asserted that African land information management systems need to be developed to deliver land-related information to decision-makers. All efforts made by the successive African governments on the landed property associated with data collection, analysis, storage, and distribution of landed information for public use have continuously failed to facilitate easy flow and widespread access to trustworthy information (Adiaba, 2014; Ghebru & Okumo, 2016 and Akingbade & Ajala 2021). There are questions about the way and manners the land information is generated

Many factors have dictated the choice of inquiry into land information generation. First, there is a need to solve the lopsided monopoly and unease usually experienced in an attempt to access land information from land information holders. Secondly, much information on land is dispersed across various government agencies and private organisations. Furthermore, the study was conducted in Ondo state due to the vibrancy of the land market. Birner and Okumo (2011) noted that the state was one of the two states where the Presidential Technical Committee on Land implemented its pilot project on land governance with a view to solving longstanding Nigeria's land governance problems. The committee implemented pilot projects for land registration in both urban and rural lands of Ondo state, thus providing the state with adequate information on land and related matters. However, land information management within the state remains an uphill task. Therefore, an inquiry into land information generation will provide an understanding of the ineptness of land information currently ravaging the land market and further enhance information sustainability.

Literature Review

Information is a collection of data or facts necessary to all human actions and crucial to their survival in a clear and logical form capable of communication (Prytherach, 1995; Hoffman, 2000; Eke, Oyadongha, & Edem, 2016). The method through which firms get relevant external data is critical to their growth. This puts organisations' with much data in a far better position than those with little data. Information is the sum of

humanity's knowledge, gathered from all subjects, in all formats, and from any source that can help eliminate doubt (Aiyepekun, 1991; Eke et al., 2016). Deductively, information is data that has been organized and managed to aid planning and decision-making. It reduces user effort by removing extraneous information items and enhances user access time. According to Abbas et al. (2014) and Adiaba (2014), land information is an important aspect that concerns government and private sector operations; it is also a renewable resource that is essential for functioning of real estate market. This is true, as observed by Wayumba and Ayugi (2017) and Tula & Geleta (2019), who noted that land information is critical in the everyday operations of land market participants such as Estate Surveyors and Valuers, charlatans, quacks, and government to contribute to any country's growth. As a result, land information management entails obtaining, processing, storing, retrieving, and disseminating all accessible and relevant land data in a geographic region to assist users in building, verifying, or improving their knowledge of the actual world (Adiaba, 2014). Land information is ostensibly intended to facilitate communication among consumers who are real estate market participants or traders, allowing them to become adequately informed about demand and supply conditions, as well as other activities in the land market. This influences decision-making and choices concerning landed properties.

Eke, et al. (2016) opined that information-producing sources are multidimensional and multi-subject. Documentary (formal sources) and non-documentary (non-formal sources) are the two types of information-gathering sources. Kaye (1995), categorised information sources based on format (oral or documentary materials, textual or audio-visual/multimedia sources, and paper-based or electronic sources), status (personal or impersonal, official or unofficial, published/open or unpublished/confidential/secret sources), and location (internally or externally sources). Land information is generated via land registration coverage in specific developing and developed nations (Augustinus, 2003; De Vries, 2004, McLaren, 2011). For example, Toulmin (2009) estimated that only 2-3 percent of land in Sub-Sahara Africa's West African region is held by written title, while McLaren (2011) estimated that only about 25% of the world's projected 6 billion land parcels are formally recorded, with the majority of these associated with the developed world. In Uganda, Wabineno, Musinguzi, & Ekback (2011) noted that land information generation is through some important stakeholders for adequate planning and taxation purposes. Twelve (12) stakeholders were identified, as well as their various roles and the nature of the information they generated.

In Nigeria, land is dispersed across departments within the Ministry of Lands, Housing and Urban Development, and other private organisations. However, the land information is stored in enormous, heavy paperwork and heaped up in offices in developing nations without adequate records being retained (Mclaren, 2011;

Wabineno et al., 2011). The emergence of computer and information communication technologies has affected the use of GIS technology and databases to create land information. Yeboah and Johansson (2010), Chandramali and Wijesekera (2012), and Hallett, Sakrabani, Keay, and Hannam (2017), for example, used the Geographic Information System (GIS) to produce data and construct a suggested database for land information in Ghana, Sri Lanka, and the United Kingdom, respectively. However, according to Nkambwe (2002), the usage of GIS aids information for land administration.

Various scholars have attempted to use GIS for land information systems. For instance, Buragohain (2002) designed a land information system for Guwahati, India, employing integrated remote sensing and GIS technologies. Collecting and digitalising the map of Guwahati city and its environs was part of the process. The study's findings revealed that GIS might be utilised to develop a decision support system that provides information on each landed property plot and its qualities. Usman (2010), however, looked at the use of cadastral information systems in Nigeria for title management. According to the study, population expansion and economic development have resulted in an exponential increase in the demand for land for diverse reasons, raising the information needs of land title administrators. In addition, given the information collection and retrieval system, which has remained unaltered in the face of growing information demands, land resource development has been done haphazardly, resulting in significant legal, planning, economic, and environmental consequences. The use of information technology tools to improve the creation, collation, analysis, retrieval, and monitoring of land information to achieve efficiency in land title management in Nigeria was advocated for in the study.

Orisakwe and Bakari (2013) also used GIS techniques to create a parcel-based cadastral information system for a portion of the Kofare Government Residential Area in Jimeta-Yola. The research region's analogue layout plan and topographical sheet were acquired, scanned, digitised, and geo-referenced as part of the process. The parcel theme was polygonized and converted to a shapefile using ArcView 3.2a software. An identifying number was used to link the spatial and attribute databases together. The developed system created a composite map of the research area. The research demonstrated the effectiveness and utility of the cadastral information system by showing several inquiries that were carried out using various criteria. Furthermore, the study discovered that GIS could create and alter land and property information. The study, however, limited its land information system to information from analogue layout plans and topographical sheets. In contrast, other information from the title documents and survey plan sheets, amongst others, could be added to develop a robust and comprehensive cadastral information system. Bulus (2014) conducted cadastral mapping research in Banjiram, Adamawa state, utilising remote sensing and a

Geographic Information System to build a digital cadastral information system that could integrate the study area's map with ownership and usage data. The scanning and geo-referencing of the research area's layout plan in ArcGIS 10.1 was utilised as the approach for the investigation. After that, the parcels were digitised and assigned unique identification numbers. GIS was primarily employed to create a computerised cadastral database using data collected in the field and those derived from the layout plan. The cadastral database enabled results and reports to be entered, updated, displayed, and generated. The study restricted land data to cadastral maps alone.

However, it is pivotal to note that the works of Buragohain (2002), Wabineno, et al. (2011), Orisakwe and Bakari (2013), Bulus (2014) and Akeh and Mshelia (2018) are quite noteworthy, but few gaps are identified. Varieties of government and privately owned organizations hold land information of a nature other than that of cadastral and survey maps. For instance, a lot of land information is generated by estate surveyors and quacks through the land lease and sales transaction. Information on decided land cases useful to potential users is well-seated in the records section of the courts. The nature and state of all information domiciled in the reserves of private and public participants in the land market need to be identified in order to make available robust and encompassing land information that is useful to end users. Also, various individuals, organisations, and the government have long tried to implement different mechanisms to improve the land information generation process. Still, these apparatuses have had a very minimal impact and are not devoid of bottlenecks. For instance, Wabineno et al. (2011) noted that survey information such as cadastral sheets, topographical base maps, and job record jackets for storing survey field data and computations remains in paper form and is compiled at different scales for urban and rural areas. Most of the sheets are in bad physical condition, and a number of them are torn, making them difficult to scan, geo-reference, and digitize. There is no synchronisation between the main offices and area offices, as information taken to the main office is not returned to the area offices for documentation. These have made the land information generation procedure more herculean task than envisaged. The land registration information in private and government domains remains manually managed, with some vital information missing from the register, making it incomplete and outdated (Puke, 2017). Due to these challenges, land information remains un-updated. This study intends to identify all land information stakeholders in order to create a sustainable and organized system that holds, describes, and disseminates the spatial and non-spatial entities of parcels and land information.

The ignorance of the general public hampered the land information generation process. Most of the public does not see the need to record their land information. A study by Boamah (2013) on the land registry reported that high transfer costs and ignorance of the law were the primary reasons why people preferred not to register

their properties. In some other situations, government officials are misinformed by the landowners, thus rendering the whole procedure useless. In addition, bureaucratic procedures, inefficiency, and ineptitude of the government staff have also mired the land information generation process. A lot of government staff does not seem to understand the purpose and functionality of the modern land information system. In some cases, the land information sources cannot be verified, and the information generated might be incorrect, thereby invalidating the whole procedure.

The advent of the computer aimed to make a man work faster and easier. Lamentably, digitizing land information generation has proven much more difficult. For instance, quite several government staff are not equipped with adequate knowledge about GIS. The few who are familiar with the application have challenges with electricity to power various machines to undertake their jobs. Furtherance to this, the problem of outdated applications cannot be overemphasized as it seems to have not adequately been considered by the various successive governments.

Study Area

The study area is Ondo State. Ondo state was created in 1976 and has its headquarters in Akure, a traditional city in Nigeria like other Yoruba towns in the country. Ondo state is one of the 36 states of Nigeria that have attempted to manage land information through a computerized geospatial information system for all land held and allocated by the State Government (Ojo, Bello, & Adeola, 2011). The rapid development in the state within the last few years resulting from the discovery of petroleum and other mineral resources may have further accounted for the influx of people into all areas within the state. However, the state's land information management process is still contending with various aggravating challenges. This, however, accords the state with a suitable scenery for studying land information management-related issues. Furthermore, land-related transactions are carried out regularly and are remarkably robust compared to other states of Nigeria. The state has developed a healthy land market with increasing participation (including the government, private individuals, families, corporate bodies and real estate professionals etc.); however, the principal challenges regarding gaps in land information flow have continually bedeviled the land market. In addition, Ondo state has a large land mass with rapid expansion inclination across the entirety of the state that characterizes the trend in other states of Nigeria making it an appropriate representative of other Nigerian states. The state provides an appropriate setting for developing a land information management system that will help achieve a responsive supply of land information and overcome the challenges confronting the land markets in various developing countries across the globe. Ondo State has always been in the limelight of land and land-related matters. Figure 1 shows the map of the study area

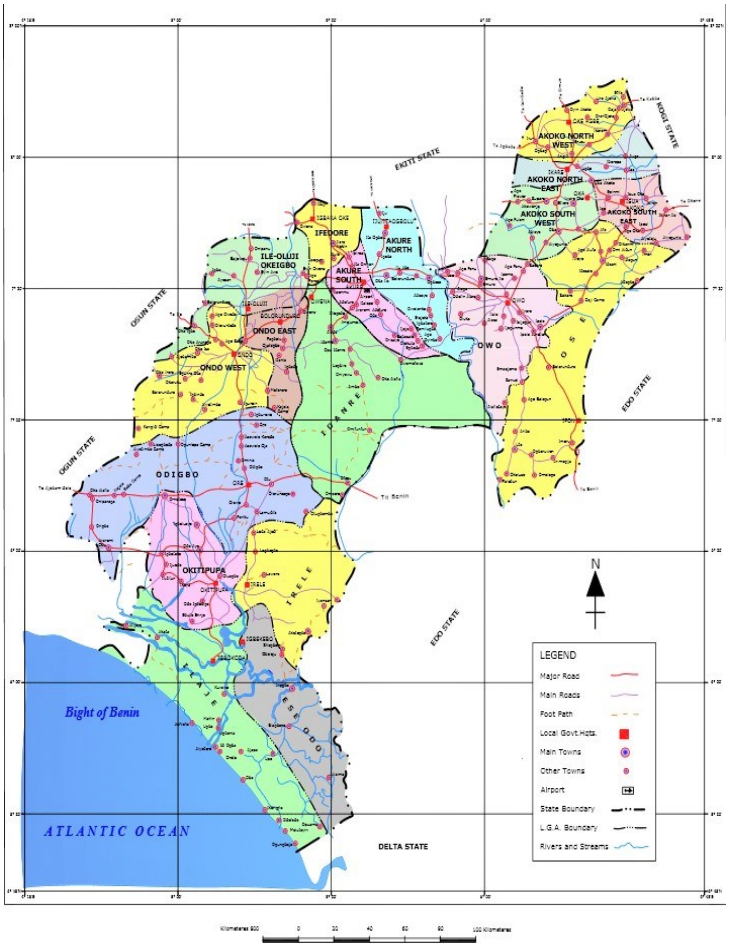


Fig 1: Map of Ondo state showing the study area
Source: Google Map

Methodology

The study adopted a survey research design. A cross-sectional survey of four hundred and forty-one (441) respondents comprising ten (10) respondents from holders of land information within the public and four hundred and thirty-one (431) private sectors respondents purposively drawn from the study area. The public sector respondents were selected randomly from ten (10) departments within the Ministries/ government agencies in charge of different land information (i.e. Land services, Deeds and deemed rights, Survey and mapping, Town planning departments within the Ministry of Lands and Housing; the Registry/ Records department of the Ondo state Judiciary and Ministry of Agriculture respectively, Estate, Land Survey and Physical Planning departments of the Ondo State Development and Property corporation and Land Use Charge Unit of the Ondo State Board of Internal Revenue. The private sector comprises registered and practicing professionals, including Estate Surveyors, Land Surveyors, Town planners, Traditional heads, and Geologists across Ondo state, Nigeria. The study used descriptive statistical tools to analyse the data collected from the respondents. Four hundred and forty-one (441) questionnaires were distributed across the public and private sectors generating and holding land information in Ondo state. The distribution of the questionnaire retrieved cut across the public sector land information holders, having a 90.00% response rate of the ten (10) questionnaires distributed to them, and the private sector land information holders had a 52.90% response rate of the four hundred and thirty-one (431) distributed across the organizations involved. Two hundred and thirty-seven (237) questionnaires in totality

were retrieved, and this represents 53.74% of the respondents sampled. This, however, implied that opinions and inferences for this study were drawn from a sizeable percentage.

Data Analysis and Discussion

This section detailed the analysis of the state of land information generated by government agencies and private organisations in Ondo state, Nigeria. The results are presented in Tables 1, 2, and 3, respectively.

Table 1: State of land information generated within the government agencies (GA)

State of land information	Frequency (%)										Mean	Rank
	10	9	8	7	6	5	4	3	2	1		
Government and private organizations hold other forms of land information other than cadastral and survey maps	5	1	1	1	0	0	0	0	0	1	8.33	1st
A lot of government personnel are still not aligned with modern land information system	4	1	2	0	0	1	0	0	0	1	7.89	2nd
Information retrieval system is at variance with the exponential increase in demand for land due to population growth and urbanization	5	0	0	0	1	0	0	1	0	2	6.78	3rd
Land information has been managed haphazardly	3	0	2	1	0	0	0	2	0	1	6.67	4th
Land information facilitates communication among real estate market participants	2	0	1	2	0	1	1	2	0	0	6.33	5th
Land information is coverage-specific in nature	0	2	1	2	1	2	0	0	0	1	6.33	5th
Land information reduces users' effort by removing extraneous information items	1	0	3	2	0	0	1	1	0	1	6.22	7th
Land information remains un-updated	2	1	2	1	0	0	0	0	0	3	6.11	8th
Land information is multidimensional and multisubject in nature	2	0	1	1	0	1	1	2	1	0	5.56	9th
Information generated by stakeholders is dispersed among land-related agencies	2	1	0	1	0	0	0	1	0	4	4.78	10th

Much information on land are not recorded	1	1	1	0	0	0	0	2	1	3	4.22	11th
Synchronization between agencies and organization is absent in land information generation process	1	0	1	0	0	1	0	3	1	2	4.00	12th
Its availability has enhanced users' access time	0	0	0	2	1	2	0	0	1	3	3.89	13th
Vital land information is missing	1	0	1	0	0	0	1	2	0	4	3.56	14th
Land information is well organized and managed	0	0	0	1	1	2	0	0	2	3	3.33	15th
Bottlenecks in the information generation process	1	0	1	0	0	0	0	1	1	5	3.11	16th
Information is stored in heavy paperwork and manually managed	0	0	0	0	0	1	0	2	1	5	2.00	17th

10 = high strong agreement, 9 = fair strong agreement, 8 = high agreement, 7 = fair agreement, 6 = slight agreement, 5 = slight disagreement, 4 = fair disagreement, 3 = high disagreement, 2 = fair strong disagreement, and 1 = high strong disagreement.

Source: Analysis of field survey, 2024

Table 1 detailed the state of land information generated within the government agencies in Ondo state. The result shown in Table 1 revealed that Government and private organizations hold other forms of land information other than cadastral and survey maps ranked 1st with a mean value of 8.33. A lot of government personnel are still not aligned with modern land information system ranked 2nd with a mean value of 7.89. Information retrieval system is at variance with the exponential increase in demand for land due to population growth and urbanization ranked 3rd with a mean value of 6.78. Land information has been managed haphazardly ranked 4th with a mean value of 6.67. land information facilitates communication among real estate market participants and land information is coverage specific in nature ranked 5th with a mean value of 6.33 respectively. Land information reduces users' effort by removing extraneous information items ranked 7th with mean value of 6.22. Land information remains un-updated ranked 8th with mean value of 6.11. this is followed by land information is multidimensional and multisubject in nature which ranked 9th with a mean value of 5.56. Information generated by stakeholders is dispersed among land-related agencies ranked 10th with a mean value of 4.78. a lot of information on land are not recorded ranked 11th with a mean value of 4.22. Synchronization between agencies and organization is absent in land information generation process ranked 12th with a mean value of 4.00. Its availability has enhanced users' access time ranked 13th

with a mean value of 3.89. Vital land information is missing, Land information is well organized and managed, bottlenecks in the information generation process and information is stored in heavy paperwork and manually managed ranked 14th, 15th, 16th and 17th accordingly with mean values of 3.56, 3.33, 3.11 and 2.00 respectively. This however implied that the state of land information generated in the public sector differs from that generated in the private sector. In furtherance to this, a lot of government personnel remain unfamiliar with the modern land information system. This is in corroboration with the work of Boamah (2013) that noted that a lot of public sector staff do not seem to understand the purpose and functionality of the modern land information system.

Furthermore, information stored in heavy paperwork and manually managed was least ranked, and this might be connected to the recent initiative of the state government in digitizing and making the certificate of occupancy process within Ondo state less cumbersome, which contradicts the findings of Wabineno et al. (2011) that bad physical condition, and poor management of land information is the major state of land information across Africa thereby making it difficult to scan, geo-reference, and digitize. The storyline of of land information in Nigeria is gradually changing with the recent government initiative. Table 2 details the response from private sector participants on the state of land information generated

Table 2: State of land information generated within the private sector (PS) in Ondo State

Types of land information	Frequency (%)										Mean	Rank
	10	9	8	7	6	5	4	3	2	1		
Information retrieval system is at variance with the exponential increase in demand for land due to population growth and urbanization	89	26	35	16	1	3	6	9	7	36	7.18	1st
Land information remains un-updated	85	28	25	13	6	4	2	7	16	42	6.81	2nd
Land information is well organized and managed	77	23	31	20	0	4	6	15	10	42	6.65	3rd
Land information has been managed haphazardly	66	14	30	15	2	0	12	14	22	53	5.83	4th
Information generated by stakeholders is dispersed among land-related agencies	49	20	46	8	7	7	0	18	12	61	5.75	5th

Much information on land is not recorded	46	20	25	12	5	17	7	12	5	79	5.23	6th
Its availability has enhanced users' access time	55	15	22	8	4	2	14	24	24	60	5.21	7th
Much personnel are still not aligned with modern land information system	60	7	23	17	2	11	7	10	4	87	5.20	8th
Land information is coverage-specific in nature	61	7	20	6	10	8	1	19	24	72	5.07	9th
Government and private organizations hold other forms of land information other than cadastral and survey maps	42	21	18	7	1	2	10	19	27	81	4.61	10th
Land information facilitates communication among real estate market participants	47	9	24	8	3	4	8	16	23	86	4.60	11th
Land information is multidimensional and multisubject in nature	23	26	21	7	9	14	1	25	25	77	4.43	12th
Vital land information is missing	35	13	17	8	7	13	2	14	24	95	4.21	13th
Bottlenecks in the information generation process	34	12	20	0	1	10	11	25	22	93	4.04	14th
Synchronization between agencies and organization is absent in the land information generation process	31	2	31	5	7	7	5	22	17	101	3.99	15th
Information is stored in heavy paperwork and manually managed	37	12	11	8	1	7	6	14	18	114	3.86	16th
Land information reduces users' effort by removing extraneous information items	32	11	21	0	1	7	13	15	16	112	3.81	17th

10 = high strong agreement, 9 = fair strong agreement, 8 = high agreement, 7 = fair agreement, 6 = slight agreement, 5 = slight disagreement, 4 = fair disagreement, 3 = high disagreement, 2 = fair strong disagreement, and 1 = high strong disagreement.

Source: Analysis of field survey, 2024

Table 2 details the state of land information generated within the private sector in Ondo State. The respondents expressed that the information retrieval system is at variance with the exponential increase in demand for land due to population growth and urbanization, as it ranked 1st with a mean value of 7.18 out of 10. Land information still needs to be updated, ranked 2nd with a mean value of 6.81 out of 10; land information is well organized and managed, ranked 3rd with a mean value of 6.65. Land information has been managed haphazardly and ranked 4th with a mean value of 5.8. This is closely followed by information generated by stakeholders is dispersed among land-related agencies as it ranked 5th with a mean value of 5.75 out of 10. Much information on land still needs to be recorded ranked 6th with a mean value of 5.23. land information availability has enhanced users' access time, ranked 7th with a mean value of 5.21. Much personnel are still not aligned with modern land information system ranked 8th with a mean value of 5.20. Land information is coverage-specific in nature and ranked 9th with a mean value of 5.07. Government and private organizations hold other forms of land information other than cadastral and survey maps ranked 10th with a mean value of 4.61. Land information facilitates communication among real estate market participants, ranked 11th with a mean value of 4.60. Land information is multidimensional and multisubject in nature, and it was ranked 12th with a mean value of 4.43. Vital land information is missing and ranked 13th with a mean value of 4.21. The presence of bottlenecks in the information generation process ranked 14th with a mean value of 4.04. Synchronization between agencies and organizations is absent in the land information generation process; Information is stored in heavy paperwork and manually managed, and land information reduces users' effort by removing extraneous information items ranked least with mean values of 3.99, 3.86, and 3.81, respectively.

In furtherance to this, a Mann-Whitney U test of the difference was undertaken to analyze the significant difference in the state of land information generated within the government agencies and the private sector in the study area. The result is presented in Table 3.

Table 3: Mann Whitney U Test on the state of land information generated within the government agencies and private sector in Ondo State

State of land information generated in Ondo State	Government Agencies			Private sector			Mann Whitney U			
	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank	Mann Whitney U	Wilcoxon W	Z	Asymp sig
Land information is well organized and managed.	3.33	2.398	15th	6.65	3.549	3rd	471.000	516.000	-2.816	.005
Land information reduces users' effort by removing extraneous information items.	6.22	2.906	7th	3.81	3.545	17th	647.500	26753.500	-1.992	.046
Its availability has enhanced users' access time.	3.89	2.619	13th	5.21	3.711	7th	798.000	843.000	-1.150	.250
Land information facilitates communication among real estate market participants.	6.33	2.739	5th	4.60	3.748	11th	697.000	26803.000	-1.681	.093

Land information is multidimensional and multisubject in nature.	5.56	2.744	9th	4.43	3.450	12th	764.000	26870.000	-1.326	.185
Land information is coverage-specific in nature.	6.33	2.500	5th	5.07	3.810	9th	896.000	27002.000	-.661	.509
Information generated by stakeholders is dispersed among land-related agencies.	4.78	4.147	10th	5.75	3.652	5th	889.000	934.000	-.693	.488
Information is stored in heavy paperwork and manually managed.	2.00	1.414	17th	3.86	3.634	16th	841.500	886.500	-.981	.326
Information retrieval system is at variance with the exponential increase in demand for land due to population growth and urbanization.	6.78	4.086	3rd	7.18	3.394	1st	989.500	27095.500	-.188	.851
Land information has been managed haphazardly.	6.67	3.464	4th	5.83	3.732	4th	900.000	27006.000	-.638	.524
Government and private organizations hold other forms of land information other than cadastral and survey maps.	8.33	2.958	1st	4.61	3.735	10th	501.500	26607.500	-2.671	.008
Bottlenecks in the information generation process	3.11	3.444	16th	4.04	3.517	14th	847.000	892.000	-.924	.356
Synchronization between agencies and organizations is absent in the land information generation process	4.00	3.122	12th	3.99	3.475	15th	914.000	27020.000	-.582	.561
Vital land information is missing	3.56	3.321	14th	4.21	3.590	13th	958.000	1003.000	-.351	.725
Land information remains un-updated	6.11	3.951	8th	6.81	3.610	2nd	851.500	896.500	-.892	.372
Much information on land are not recorded	4.22	3.701	11th	5.23	3.696	6th	906.500	951.500	-.608	.543
A lot of personnel are still not aligned with modern land information system	7.89	3.060	2nd	5.20	3.844	8th	639.500	26745.500	-1.990	.047

Source: Analysis of field survey, 2024

Table 3 presents the results of the test statistics for the Mann Whitney U test of difference in the opinion of the respondents on the state of land information generated in the private and public sectors generating land information in Ondo State. The results showed the asymptotic significance (p-value) of the measured state of land information using the public sector and private sector perception as the grouping variable. Seventeen variables were considered. Table 3 above, however, revealed that four variables i.e., land information is well organized and managed (z value = -2.816, p value = .005), land information reduces users' effort by removing extraneous information items (z value = -1.992, p value = .046), Government and private organizations hold other forms of land information other than cadastral and survey maps (z value = -2.671, p value = .008) and much personnel are still not aligned with modern land information system (z value = -1.990, p value = .047) revealed a significant difference in the opinion of respondents on the state of land information generated in Ondo state with a significant level p value ≥ 0.05. This, however, implied that the result is statistically significant because the probability value (p) is less than or equal to .05, so there is a statistically significant difference in the respondent's opinion on the four variables identified in the table above. This could be a result of the differences in the way and manner by which the government and private organisations

hold and manage land information. The government sector still holds land in hard print (Mclaren 2011; and Wabineno et al. 2011), while a lot of private sector land information holders are gradually making use of the modern land information management system (Yusuf & Adekoya 2021). Even though they are yet to computerise land information within their jurisdiction fully. The Mann-Whitney U test of difference in the opinion of respondents for the remaining thirteen (13) variables revealed that the responses are not significantly different between the sampled groups. This may be attributed to the limited exposure or experience with land information. The public sector and private sector alike hold land information that both parties find difficult to share. This has further culminated in the information dearth problem ravaging the Nigerian land market.

Conclusion and recommendation

Despite the positive progress made by land information holders in making land information management seamless and less cumbersome, the whole process remained stifled with crucial factors that might have inhibited attempts made to provide more comprehensive access to land information, thereby defeating land information management best practices. The current state of land information has not helped in achieving a reliable and sustainable land information management system that would satisfy users' needs and deliver clear benefits to the citizens. Land information in Sub-Saharan Africa should aim at providing tenure security, support economic development by generating strong land markets and proper land use planning, reduce land disputes, and encourage good land management practices. This could be achieved through synchronization between government agencies and private organizations involved in the land information generation process. Therefore, government agencies and private sector land information holders should ensure collaboration and harmony in developing encompassing land information that will be useful for all.

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