

Challenges of Digitalizing Land Administration System in Nigeria: The Kaduna State Experience

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Abstract

Purpose: This paper examined the challenges that have arisen in the attempt at digitalizing land administration system in Nigeria using Kaduna State as case study.

Design / Method / Approach: A list of challenges and solutions associated with the digitalization of land administration systems was drawn into a structured questionnaire and administered on officials of land administration and other relevant stakeholders. The questionnaire items are presented in a 5-point Likert scale format. Retrieved questionnaires are analyzed and presented using the descriptive frequencies, percentages

Findings: This study identified a poor power infrastructure, low internet connectivity and paucity of training of personnel as the main challenges in digitalization of land administration system and proffer training and motivation of personnel to overcome these challenges.

Research Limitations: The samples taken are small as compared to the size of the country as well as the percentage of the population. Thus, the study is limited only to one state in the northern part of the country.

Practical Implications: A sound Land administration system is paramount to the economic development of a nation. Ordinarily, digitalization not only aids rapid decision making on land matters but helps unlock the economic capital locked in untitled landed assets.

Originality: This study contributes to the increasing body of research on challenges faced in digitalization of land administration system

1. Introduction

The UN (1996) defines *Land Administration* as the process of determining, recording and disseminating information on ownership, value and use of land when implementing land management policies. Land administration plays an important role in supporting sustainable development, thus it serves society when implementing land policy through land management activities, Acharya, (2009). Land administration can also be defined as the process of regulating land and property development, and the use and conservation of the land, the

gathering of revenues from the land through sales, leasing and taxation, and the resolving of conflicts concerning the ownership and use of the land (Dale and McLaughlin, 1999).

Land is the greatest resources in most countries of the world. Land administration is basically a process of managing the relationship between people and land. Thus we can see it is place based and people centric. The major purpose of an ideal land administration system is to create open market economies which will in turn transform land into an economic commodity. It also help to regulate procedure, methods and standards related to the production, management and dissemination of land information system that are created in the process transacting the operations of land administration. The core functions of land administration are based on the accurate boundary survey of the land parcel and the registration of rights over that parcel. It is for this reason that priority should be given to improving the data quality, efficiency of services, and accuracy of the geometry of the parcel and land register (Acharya, 2009).

We are in a rapidly advancing information age which technology has served as a viable tool in the optimization of the various resources for economic development in the larger society. Modern technology has continued to have a strong positive influence on the social, economic and institutional systems. Land administration system being mainly geographical in nature requires good geospatial information to manage geographic elements and this becomes all the more compelling in a digital world. The digitalization of land administration system is thus necessary to provide a seamless real time communication and dissemination of information about land use and transactions in order to stimulate the development and even foster sustainable development (Atilola, 2010).

Land administration system gives a country necessary the infrastructure for implementation of land policies and land management strategies which will in turn support sustainable development. The capacity of a nation to open up its economy for international investments is rated as on how business is facilitated. A cardinal measure of ease of doing business for any modern economy relates among others on how property based transactions and land use and development processes are conducted. Information particularly on land titling, and property rights as transacted is key to intending investors and it is for this reason that the land administration system requires spatial framework to operate. A digitalization of the land administration system is critical to provide reliable data on lands including its tenure and other dimensions to end users.

Constrained by operational hiccups that arise with manual land administration processes, many states in Nigeria have recently embraced a digitalisation of the land administration systems utilizing a geographical information architecture that have negligibly improved their pre-GIS performance levels.

This paper explores the challenges faced in the digitalization of land administration systems in Nigeria by sampling the opinions of land administrators in the North-Western State of Kaduna.

Pioneered by the Ministry of the Federal Capital Territory in the late 80s as means to manage the multi-faceted problems of managing land titling and transaction related infractions, Geographical Information Systems has become the most sought after practice for Nigerian states. The process of acquiring and setting up GIS based land administration in Nigeria is very costly and is usually justified on the need to establish a transparent functional land management system. Beneath the goal of achieving transparency in land administration, beneficiaries have come to be burdened with very high service delivery charges and it is imperative to explore the challenges confronting the establishment of GIS based land administration.

Kaduna is the capital city of Kaduna State in North West Nigeria. It is the reputed regional capital of the defunct Northern Protectorate established in the 1890s prior to the amalgamation of Northern and Southern Protectorates to form the nation of Nigeria in 1914. Kaduna is home to several academic institutions of repute including the Nigeria Defence Academy, National Water Resources Institute, The Nigerian Air Force Institute, Kaduna State University, Kaduna Polytechnic, Federal Cooperative College, and several other institutions. Kaduna has remained a seat of several governmental agencies and departments like the National Eye Centre, National Ear, Nose, and Throat Centre, The Federal Neuro-psychiatric Hospital, the National Museums, The National Archives, and the BarauDikko Teaching Hospital. Kaduna is also home to several military formations like the 1st Division of the Nigerian Army, several formations of Nigerian Air Force. Prior to the collapse of the Nigerian industrial sector owing to the protracted economic recession, Kaduna in the first three decades post-independence was the hub of textiles manufacturing in Nigeria. According to the Nigerian Population Commission the city which is now composed of Kaduna North, Kaduna South, parts of Chikun, and IgabiLGAs. The four LGAs have a combined population of 1,570, 330 and about 80% of this live within the metropolis of Kaduna (NPC, 2006). Kaduna has retained its economic and socio-political status over the years and is a major regional city in modern Nigeria. Kaduna State land administration history predates the nation as colonialists had experimented, introduced, and first operated most of the post-amalgamation land laws that would be later extended to other parts of Nigeria from Kaduna like the Land Registration Ordinance of 1915.

2. Review of Related Literature

A land administration system is concerned with administrative and operational processes that deal with information about the tenure, value and use of land. Digitalization of land administration system can be seen as the adoption and

deployment of appropriate technology that enables a capture and transformation into digital form of all data generated in processes of land administration. It automates the data storage, processing, presentation and dissemination of the resulting spatial information. It has also defined as a computer based tools for capturing, manipulating and displaying geographic and land related data in the computer with specialized software (Adeoye& Mensah, 2008).

In Nigeria as obtain with most modern economies, the various state governments operate a Bureau or Ministry charged with land administration duties as part of its statutory land management functions. The agency is saddled with processing land title applications, keeping records of both private and public transactions in land, valuation of properties for various public purposes, exercising government powers of compulsory acquisition, to administer and/or collect taxes arising from land based transaction, etc.

The Land bureau thus generates and has a lot of land related information that consists mainly of:

- Personal data of applicants for statutory titles and owners of land parcels
- Cadastral information on layouts
- Other land information management data such as acquisition, assessments, allocations, valuations, consent, assignment, etc
- Land registration

Thus, to put these land information into a geo information system format requires digitalization of land related records, creation of land databases, the provision of software facilities for the compilation of personal data of applicants for title to land, and other transaction needs, and the designing of a robust management information system for analysis of land records. (Adeoye& Mensah, 2008).

Youngho (2006), undertook a study of the role of cadastral information for the good land administration in South Korea. He identified that the main domain of land administration system consists of three disciplines which include Cadastre, Land registry and Land valuation. He focused on the role of cadastral system as the information provider of measurement based survey records and the important factors to be considered for the development of a new land administration system within a national spatial data infrastructure. He concluded that digitalization of land administration system should be promoted to facilitate generation, interchange and application of information. He also asserted that a complete understanding of the status of land ownership will help financial institutions as regards the use of land as collateral and that digitalization increases land value.

Adeoye & Mensah (2008), examined the computerization of land management systems as a tool for good governance. The authors expressed need for digitalization in land administration system because of the changing societies priorities, globalization and information technology revolution. Thus, they identified the following as some of the reasons for digitalization of land administration:

- Increase application for land documentation
- Access to land administration technology
- To conform to global best practices
- In furtherance of ongoing micro- economic reform
- E – government reforms
- To address challenges of capacity building
- The ease of doing business

Adeoye & Mensah further identified the necessary infrastructures for digitalization of land administration system to include:

- Satellite imagery
- GIS hardware
- GIS software
- Conversion of analogue land records into digital formats

They also identified that the overall goals of digitalization of land administration system is to be able to design a geo information system which will facilitate land administration process such as:

Land Valuation

- Determining values, objectives and the legal framework in relation to management of land as a legal, economic, and physical object.
- Basis for building sound land administration infrastructures.

Cadastral Systems

- Identification of land parcels and securing land rights
- Facilitate land registration, land valuation, and land-use control
- Underpin sound Land Administration

Land Administration Systems

- Administration of land tenure, land value, land-use, and land development

- Facilitate efficient land markets and effective land-use management
- Underpin sound Land Management

Land Management

- Management of processes by which land resources are put into good effect.
- Facilitates economic, social, environmental sustainability
- Underpins and implements sound Land Policies

Some of the benefits that can be derived from digitalization of land administration system include Improvement in land title security, reduction in falsification of land documents, physical reorganization/ recertification of land document, secured land registration, Improvement in infrastructural facilities deployment and enhanced capacity for increased revenue mobilization (Adeoye & Mensah, 2008).

They identified the following as the challenges faced in digitalization of land administration system:

- Poor power infrastructure
- Low internet connectivity
- Paucity of training of personnel
- Lack of financial resources
- Inability to acquire requisite technology
- Absence of relevant regulations
- Capture and maintenance of database
- Capture and maintenance of database

Nahrin & Rahman (2009), examined Land Information System (LIS) for Land administration and management in Bangladesh. They admitted that Land Information System is the most accountable and feasible systematic approach for developing an up- to date Land administration and management. Their study is on the challenges of Land Information System and the existing Land Administration System. They found out that issues affecting digitalization are legal, political, technical and financial in nature. These issues must have to be resolved to achieve an effective Land administration and management.

Acharya (2009), examined adopting GEO- ICT for land administration system in the context of problems and solutions. He asserted that digitalization of land administration system could be a prime instrument to support the overall objective of the envisaged land administration system of a nation. He pointed out duplicity of institution covering land information, lack of adequate

regulation, insufficient number of qualified surveyors, limited scientific competence etc as some of the problem associated with digitalization of land administration system. He posited that to achieve success, there must be capacity building, institutional reforms, devolution of functions and services, education and continuous training and the commitment of the government and other stakeholders.

Atilola, (2010) on his part looked at land administration reforms in Nigeria by dissecting the issues and prospects involved with it. He opined that the objectives of land administration reform rests on knowledge, development of appropriate ICTs, and Action and these three remain the main components for a land administration reform.

Oboli & Akpoyoware, 2010 in their paper titled *Reform in Cadastre and Land Administration in Nigeria- Coping with Challenges in Development* identified technological know- how, funding and poor public perception as the problems associated with digitalization of Land Administration system.

And recently Augustinus (2015), identified insufficient digital data as one of the challenge of land administration system, he stated that land documents are critical for cities, and that digital land administration underpins city management and by extension land documents underpin planning and implementation of plans, service delivery, revenue collection/ municipal financial sustainability. Babalola (2015) in appraising the possibilities of adopting the Land Administration Domain Model (LADM) in Nigeria discovered that there is no blueprint model for land administration and management in Nigeria. He thus expresses need to develop a model that can be used to stimulate the development of software application such as LADM. This is believed will help in the implementation of proper land administration for sustainable development in Nigeria.

Augustus and Olakanmi (2016), looked at the importance of cadastral survey information for effective land administration in Nigeria in a bid to provide an up- to- date digital database for land administration and management. The study stressed that digitalization is important for land administration and management of spatial data and also for solving environmental and human problems. They identified the major challenges as the lack of up to date digital database which they believes will help the country to generate revenue from land resources. There is also the problem of identifying land use pattern and modeling the user's requirement so that the system will be able to answer some questions. They concluded that digitalization of land administration system will lead to better specification of rights and improved security, develop responsibilities to finance development and ease implementation of policy measures.

Tariq Bib Sarwar, et al. (2017), examined the critical analysis of the challenges of land administration and management in Bangladesh. He emphasized that

land is directly connected with economic development. They acclaimed that land administration is a complex task that ought to be undertaken by the state. They identified lack of skilled manpower, lack of technology as some of the challenges of land administration in Bangladesh. They strongly believe digitalizing of land records will improve the land administration system and ensure land rights of the people of Bangladesh. Todorovski, et al (2017) looked at introducing fit for purpose land administration approach in Ecuador. They recognized land administration to be critical in the success of economic growth, food security, national conservation and poverty reduction. They observed that conventional land administration systems do not provide proof of ownership to those who are informal land right holders. They call for a need to develop an approach meets the requirements for economic, fast and sustainable method of land mapping, registration and titling which will in turn address all land tenures including informal tenures issues. The fit for purpose land administration concept include three interrelated core components which include spatial, legal and institutional framework. The spatial framework address the digitalization of land administration system which is the way land is occupied and used.

Dale & McLaren (nd) undertook a study on GIS in land administration. They assert that the fact that the efficient and effective land administration and its associated resources is dependent upon the availability of good land information system. And in order to provide both administrators and data users with accurate and up- to- date information about land, there is need to develop a rapid and efficient system for data collection, update and distribution. They believed that improvements in land administration system can be driven by technological development and that digitalization is a fundamentals tool for effective land administration system. The various function of land administration can be put together by the digitalization of land administration system. The implementation of Land administration system needs the cooperation of both government agencies and private sector organization.

3. Method and Data

The study rated the reasons and benefits of digitalization of land administration system as well as the challenges and possible solutions to the challenges of digitalization of land administration system. The study make used of both questionnaires and secondary data sources. The sources of the secondary data were journal articles, textbooks, internet materials and other secondary data sources.

The study population comprises of key personnel in the Ministry of Lands. They were considered because they are saddled with the responsibilities of digitalizing the land administration system. The opinion of selected staff was sampled vide a questionnaire with items presented in a 5- point Likert scale format and it examined the reasons, tools, benefits, challenges and possible solutions to the challenges of digitalization of land administration system. The retrieved questionnaires are analyzed using the descriptive frequencies and

percentages with SPSS. Ten questionnaires were administered on land administrators, but seven were retrieved and of these, six were found usable for analysis.

4. Results of the Analysis

4.1 Characteristics of Respondents

The sampled respondents comprised of senior officials in the Ministry of Land of Kaduna state from the level of Principal rank and above. In term of working experience 33.3% of them have experience spanning 11-15 years while the remaining 66.6% have over 16 years' experience. This indicates that the respondents are knowledgeable on the subject under study and have worked long enough to make valuable opinion on the issues for the survey.

Table 1: Rated Reasons for Digitalization of Land Administration in Kaduna state

Reasons	SD	D	N	A	SA
Increasing applications for land documentation				16.7	83.3
To conform to global best practices					100
Access to land administration technology					100
In furtherance of ongoing micro economic reform				33.3	66.6
E- Government reforms				16.7	83.3
To address challenges of capacity building			16.7	33.3	50
The ease of doing business			16.7	16.7	66.6

Source: Field Survey, 2018

Table 1 shows that six (100%) of the respondents strongly agree that digitalization of the land administration system is to conform to global best practices and to access land administration technology. One (16.7%) and five (83.3%) respondents agree and strongly agree respectively that increase application for land documentation and E-Government as reasons for embracing digitalization. Two (33.3%) and four (66.6%) of the respondents agree and strongly agree respectively that it is in furtherance of ongoing micro economic reform as reason for digitalization. One (16.7%) is neutral, Two (33.3%) agree and three (50%) strongly agree to the reason of addressing challenges of capacity building. On the ease of doing business as reason for digitalization of the Land Administration system, one each of the respondents (16.7%) is neutral and agree, and while another four (66.6%) strongly agree.

Table 2: Rating of Requirements for Digitalization of Land Administration

Requirements	SD	D	N	A	SA
Satellite imagery					100
GIS Hardware					100
GIS Software					100
Conversion to digital frame	33.3	66.6			

Source: Field Survey, 2018

Table 2 shows that six (100%) of the respondents strongly agree that satellite imagery, GIS hardware and software are basic requirements for digitalization of land administration system while two (33.3%) and four (66.6%) of the respondents respectively strongly disagree and disagree respectively that conversion of analogue land record into digital forms is a process required for digitalization of land administration system.

Table 3: Benefit of Digitalization of Land Administration

Benefits	S	D	N	A	SA
	D				
Improvement in land title security				33.3	66.6
Reduction in the falsification of land documents					100
Physical reorganization/recertification of land document				16.7	83.3
Secured land registration				33.3	66.6
Aids improvement of infrastructural facilities deployment				16.7	83.3
To enhance capacity for increase revenue				50	50

Source: Field Survey, 2018

Table 3 shows that all six (100%) of the respondents strongly agree that reduction in the falsification of land documents as benefits for digitalization of land administration system. One (16.7%) and five (83.3%) agree and strongly agree respectively that Physical reorganization/recertification of land document and Aids improvement of infrastructural facilities deployment as benefits. All respondents are in agreement that Improvement in land title security and Secured land registration are benefits of digitalization (Two (33.3%) and four (66.6%) of the respondents respectively agree and strongly agree), while three (50%) each of the respondents agree and strongly agree that to enhance capacity for increase revenue as benefits for digitalization of land administration system.

Table 4: Challenges in the Digitalization of Land Administration

Challenges	SD	D	N	A	SA
Poor power infrastructure					100
Low internet connectivity					100
Paucity of trained personnel			16.7		83.3
Lack of financial resources			16.7		83.3
Inability to acquire requisite technology				16.7	83.3
Absent of relevant regulations	16.7				83.3
Capture and maintenance of database			16.7		83.3

Source: Field Survey, 2018

Table 4 shows that six (100%) of the respondents strongly agree that poor power infrastructure and low internet connectivity are the major challenges in the digitalization of land administration system. A majority of the respondents strongly agree (five, 83.3%) that paucity of trained personnel, lack of financial resources, and the capture and maintenance of database are challenges of digitalization. A majority of the respondents also agree that the inability of States to acquire requisite technology and the absence of relevant regulations are challenges to the digitalization of land administration system.

The analysis in Table 5 shows that all the respondents see effective devolution of functions/services amongst agencies as one possible solution to the challenges of digitalization of land administration system. Majority of the respondents (five, 83.3%) also strongly agree that institutional reforms, commitment of stakeholders to ensuring effectiveness, acquisition of improved technology and provision of requisite infrastructure/logistics are the other possible solutions alongside Education and continuous training of personnel is the solution to the challenges of digitalization of land administration system (four, 66.6%).

Table 5: Suggested measures to the challenges in the Digitalization of Land Administration

Possible solutions	SD	D	N	A	SA
Institutional reforms				16.7	83.3
Effective devolution of functions/services amongst agencies					100
Education and continuous trained personnel				33.3	66.6
Commitment of stakeholders to ensure effectiveness				16.7	83.3
Acquisition of improved technology				16.7	83.3
Provision of requisite infrastructure/ logistics				16.7	83.3
Capture and maintenance of database				16.7	83.3

Source: Field Survey, 2018

5. Conclusions and Recommendations

It is apparent from this study that poor power infrastructure and low internet connectivity are the major challenges faced in the digitalization of land administration amongst others challenges. It is also not lost on the operators of our land administration systems that the digitalization will impact the economy positively by making for ease of doing business. Where digitalization of land administration is achieved, the property market practices will be standardized. Achieving this requires an effective devolution of service and functions among stakeholder agencies in the land administration system.

In the light of this study's findings the authors' propose the following recommendations:

1. The academia and practitioners should pay more attention to the education and training of personnel in the used of the tools and process involved in the digitalization of land administration system.
2. The government and others stakeholders should be proactive and committed to the digitalization of land administration system as lot of benefit can be derived from its effective operation. This will help boost capacity of relevant personnel to man the sector.
3. The respective state governments in Nigeria should commit funds to fast track and digitalization of land administration system.
4. Government should help standardize the digitalization programme by setting common standards for the respective states such as would enable a syncing of databases nationwide. If achieved this will fast track the openness of the Nigerian property market.
5. Necessary regulatory and legal frameworks have to be put in place to properly devolve roles to avoid working at cross purposes and ensure the benefits of digitalization are fully achieved.

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APPENDIX

QUESTIONNAIRE

This questionnaire is designed to gather information on a research paper titled **“CHALLENGES OF DIGITALIZING LAND ADMINISTRATION SYSTEM IN NIGERIA: THE KADUNA STATE EXPERIENCE”**

ABOLADEABIODUN

SECTION A

1. Name (optional)
.....
2. Gender: Male () Female ()
3. Designation: Manager () Supervisor () Technologist ()
Technician () Operator ()
4. Working experience 1-5 () 6 -10 () 11- 15 () above 16 ()

SECTION B

1. Rate the following reasons for digitalization of land administration in Kaduna State

Reasons	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Increase application for land documentation					
To conform to global best practices					
Access to land administrative Technology					
In furtherance of ongoing Micro economic reform					
E- government reforms					
To address challenges of Capacity building					
The ease of doing business					

2. Rate the following requirements as suitable tools and processes for digitalization of land administration system

3. Rate what is your opinion on the Benefit that derivable in the digitalization of land administration system

Benefits	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Improvement in land title security					
Reduction in falsification of land documents					
Physical reorganization/ recertification of land document					
Secured land registration					
Aid Improvement in infrastructural facilities deployment					
To enhance capacity for Increase revenue					

4. Rate the following Challenges associated with digitalization of land administration system in order of your agreement

Challenges	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Poor power infrastructure					
Low internet connectivity					
Paucity of trained personnel					
Lack of financial resources					
Inability to acquire requisite technology					

Absent of relevant regulations					
Capture and maintenance of database					

5. Rate the possible solution to the challenges facing digitalization of land administration system in order of your agreement

Possible solution	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Institutional reforms					
Effective Devolution of functions and services amongst agencies					
Education and continuous training of personnel					
Commitment of stakeholders to ensuring effectiveness					
Acquisition of Improved technology					
Provision of requisite infrastructure/ logistics					