



**FEDERAL UNIVERSITY OF TECHNOLOGY
MINNA**



**SCHOOL OF ENVIRONMENTAL TECHNOLOGY
INTERNATIONAL CONFERENCE (SETIC 2016)**

SETIC 2016 *Conference Proceedings*

EDITORS:

**Yekeen A. SANUSI
Olatunde F. ADEDAYO
Richard A. JIMOH
Luqman O. OYEWObI**

THEME:

**SUSTAINABLE BUILT ENVIRONMENT
AND CLIMATE CHANGE:
THE CHALLENGE OF POST 2015
DEVELOPMENT AGENDA**

DATE:
**TUE. 10TH - THUR. 12TH
MAY, 2016**

VENUE:
**SCHOOL OF ENVIRONMENTAL
TECHNOLOGY COMPLEX**

TIME:
**9:00AM - 5:00PM
DAILY**

CHIEF HOST:
PROF M. A. AKANJI
VICE CHANCELLOR, FEDERAL UNIVERSITY
OF TECHNOLOGY, MINNA

HOST:
PROF Y. A. SANUSI
DEAN, SCHOOL OF ENVIRONMENTAL TECHNOLOGY,
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

SUPPORTED BY



**School of Environmental Technology
International Conference
(SETIC) 2016**

10-12 May 2016

**Federal University of Technology Minna,
Niger State, Nigeria**

Conference Proceedings

Editors

**Yekeen A. SANUSI,
Olatunde F. ADEDAYO,
Richard A. JIMOH,
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Conference Proceedings of the School of Environmental Technology International
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10th – 12th May 2016
School of Environmental Technology,
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FOREWORD

The organising committee of the 1st School of Environmental Technology International Conference is pleased to welcome you to Federal University of Technology Minna, Niger State Nigeria.

The conference provides an international forum for researchers and professionals in the built and allied professions to address fundamental problems, challenges and prospects that affect the Built Environment as it relates to Climate Change and Sustainable Development. The conference is a platform where recognised best practices, theories and concepts are shared and discussed amongst academics, practitioners and researchers. The papers and scope are quite broad but have been organised around the sub-themes listed below:

- Infrastructure Development and Financing
- Sustainable Practice Theories
- Urban Resilience and Energy Conservation
- Waste Management and Sanitation
- Health and Safety Issues
- Climate Change and Threat to Sustainability of the Built Environment
- Climate Change Induced Disaster
- Designing the Human Settlement for Climate Change
- Conceptual Issues on Climate Change and Sustainable Development
- Sustainable Materials
- Cross Cutting Issues

The peer review process saw us making use of 48 senior academics and specialist as reviewers drawn from institutions in Nigeria and England. There were some papers were outside the theme of the conference but we had to create a cross cutting issues to accommodate such papers this is in spirit that every knowledge is important.

We hope you enjoy your time at our conference, and that you have the opportunities to exchange ideas and share knowledge, as well as participate in productive discussions with the like-minded researchers and practitioners in the built environment and academia.

Professor Yekeen Adeeyo Sanusi
Conference Chair
School of Environmental Technology International (SETIC) 2016
Federal University of Technology Minna, Niger State Nigeria.
May 2016

ACKNOWLEDGEMENTS

The success of the 1st School of Environmental Technology International Conference holding at the Main Campus of the Federal University of Technology Minna, Nigeria is predicated on the support and goodwill from Vice-Chancellor of Federal University of Technology and many other highly motivated people.

I sincerely wish to appreciate you for attending this maiden event and to warmly welcome you to the city of Minna the capital of the *POWER STATE*. It is a great honour to have you in the beautiful campus of Federal University of Technology Minna, Nigeria, **THE MOST PEACEFUL UNIVERSITY IN NIGERIA**. I am aware of the great sacrifices made by many of you to be present in this occasion and I will definitely not overlook the long distances some of you have had to cover to get to this conference venue. We genuinely appreciate all your efforts. It is our singular hope and desire that the conference meets your expectations and gives you unquantifiable experience and tremendous developmental networking opportunities for a life fulfilling career.

We are grateful for the presence of the Vice Chancellor of the Federal University of Technology Minna – Professor Musbau Adewumi Akanji whose leadership and distinguished academic career has served as inspiration and encouragement to many young academics. His desire to see the University compete at International level has led to the upsurge in the organisation of International conferences, Public lectures and Seminars on regular basis within and outside the university. We are happy to have you as the Chief host to declare the conference open and deliver the welcome address.

We are grateful to the Dean of School of Environmental Technology, Federal University of Technology Professor Yekeen Adeeyo Sanusi for providing the robust platform, academic support and leadership for the organisation of the conference. You threw the challenge and provided the required resources and strategies for achieving its success, it is a great honour of having the opportunity to learn at your feet. We are happy to have you as the host and keynote speaker at the conference. I wish to thank also all the special guests particularly leaders of the Industry, Built Environment and Academia.

SETIC is beginning at the foundation this year and for this I wish to thank all those who have supported us through various forms of participation. Specifically I wish to thank the delegates and the partners for contributing significantly to the conferences. I wish to thank Prof. Oluwole O. Morenikeji (DVC Academic), Prof. Stella N. Zubairu and Prof. A. M. Jinadu who genuinely and consistently monitored the progress of the conference preparations. It is my desire that SETIC becomes a constant feature in the calendar of the university and global conference listings.

Delegates to SETIC 2016 are from 39 different academic and research institutions that are spread across six different countries. This offers participants a wonderful opportunity for exchange of cultural, social and academic ideas during the conference periods. It is also an opportunity to create awareness about programmes and events at the participants' individual institutions. I encourage you all to make good use of the networking opportunities that are available.

We received a total of 226 abstract, based on a quick review we were able to accept 175 of them and the authors were communicated on what they needed to focus on while developing the full papers. A total of (129) full papers were received and reviewed, the reviewers report for the authors to make corrections and submit revised papers. It was after the process that we were able to accept 112 papers for presentation at the conference, I therefore congratulate all the authors whose papers made it to the conference. We acknowledge the amount of hard work you had all put in producing these papers. It is my sincere believe that the presentation of the different ideas in your paper would go a long way in improving the knowledge of the participants and also generate meaningful discussions at the tea beaks, lunch and beyond.

I wish to express my utmost gratitude to each reviewer for a wonderful job done and for tolerating our deadlines and Oliver Twist syndrome. It is your dedication and expertise that has ensured that the conference is a success.

Special thanks to all our keynote speakers, Prof. Oluwole O. Morenikeji (Deputy Vice-Chancellor Academics, Federal University of Technology Minna), Prof. Hussein Makun (Director, Directorate of Research Innovation and Development, Federal University of Technology Minna), Prof. Musa Aibinu (Director, Centre for Distance Learning), Prof. Mustapha Zubairu (Director, Centre for Human Settlement and Urban Development), Dr. Appolonia A. Okhimamhe (Director, WASCAL) and Prof. Yekeen Sanusi, (Dean School of Environmental Technology, Federal University of Technology Minna).

It is important to appreciate the roles and efforts of the following people for their selfless and very significant contributions made towards the successful organization of the conference: Adedokun John, Idowu Oqua, Akhabue Oriwoh and Ailoyafen Dorcas (for being available to run around at very short notice), Arc. Oyetola Stephen and Tpl Samuel Medayese (for typesetting the papers for the conference proceedings).

I have come to realise that it is not easy to organize conference without dedicated individuals offering to serve. My heartfelt gratitude goes to Dr. R.A. Jimoh, Dr. L.O. Oyewobi, Dr. Taibat Lawanson, Dr. P. Ayuba, Dr. J.J. Dukiya, Dr. A.I. Anunobi, Dr. N.I. Popoola and Dr. O.A. Kemiki for their unflinching support all through the process.

It is our sincere hope that this conference will serve as a forum for the advancement of research in the urban sphere towards achieving a sustainable environment. It is our sincere believe that academics and professionals in practices will continually participate in this forum.

Once again I wish to thank you all for creating time out of your busy schedule to attend this conference. Please do enjoy your stay at Federal University of Technology Minna, and the city as a whole. Ensure that you make use of the different fora created throughout the conference to build new relationships for the future and strengthen existing relationships. I look forward to seeing you all in future.

Olatunde Folaranmi ADEDAYO
Chairman SETIC 2016 Organising Committee
May 2016

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DECLARATION

PEER REVIEW AND SCIENTIFIC PUBLISHING POLICY STATEMENT

10th May 2016

TO WHOM IT MAY CONCERN

I wish to state that all the papers published in SETIC 2016 Conference Proceedings have passed through the peer review process which involved an initial review of abstracts, blind review of full papers by minimum of two referees, forwarding of reviewers' comments to authors, submission of revised papers by authors and subsequent evaluation of submitted papers by the Scientific Committee to determine content quality.

It is the policy of the School of Environmental Technology International Conference (SETIC) that for papers to be accepted for inclusion in the conference proceedings it must have undergone the blind review process and passed the academic integrity test. All papers are only published based on the recommendation of the reviewers and the Scientific Committee of SETIC

Names and individual affiliation of members of Review and Scientific Committee for SETIC Conference 2016 are published in the SETIC 2016 Conference Proceedings and made available on www.futminna.edu.ng

Olatunde Folaranmi ADEDAYO
Chairman SETIC 2016
Federal University of Technology, Minna, Nigeria

Papers in the SETIC 2016 Conference Proceedings are published on www.futminna.edu.ng.

REVIEW PANEL

We wish to express our deepest and sincere gratitude to the following people in no particular order who provided comprehensive scientific reviews and made commendable suggestions towards improving the over 200 abstracts and 100 full papers submitted to SETIC 2016. They provided constructive comments to authors regarding their papers, it is necessary to state that there was no reported case of conflict of interest by any of the reviewers or the authors.

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BUILDING A MODERN LAND ADMINISTRATION SYSTEM IN NIGERIA

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Land administration is a significant framework for the management of any nation's pool of resources and has remained one of the most chatted discourses among urban issues in many developing countries. This paper examines the issues in land administration in Nigeria and other developing countries, looking at the various administrative and legal frameworks in place for an efficient land delivery system. The land administration system in Nigeria is plaque by challenges spanning from policy, institutional and legal frameworks to technical and operational issues which have direct impact on implementation. These challenges emanated from some of the import ideologies that adjustments could not be made upon. The study recommends the reform of policies and the creation of a local integrated land administration system model (LAS) that will accommodate our country peculiarities. Also the development and sustenance of an ICT based professionals and infrastructure that will enhance efficiency in the land information system.

Keywords: Land Administration, Institutional Framework, efficiency, Policy,

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Kemiki et. al. (2016). **BUILDING A MODERN LAND ADMINISTRATION SYSTEM IN NIGERIA** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

1.0 INTRODUCTION

Land remains critical to any significant development of man and his society. The continued existence of man and his growth depend on the availability of land for the much needed development. This important resource of the earth which cannot be reproduced, destroyed nor depleted can however be mismanaged and once this done, the economy of such urban areas maybe distorted and will also impact on the socio-political fabric of the state. The consequences of which will be detriment of man.

It has been discovered that land accounts for between half and three-quarters of national wealth and a focused attention on land utilization have been an important step in achieving economic development and social stability in many countries around the world (Ukaejiofo, 2009). Ukaejiofo (2009) further added that the level of economic and social development of any society or nation is substantially tied to the level of rights exercisable by the citizens over their land resources. This is because land is considered as the ultimate resources for socio-economic development and the effective management of this resource is of utmost important to that nation for its development (United Nations Economic Commission for Africa *UN-ECA*, 2003).

Land administration is the tool for implementing a nation's land policy and is seen by United Nations Economic Commission for Europe, *UN-ECE* (1996) as the processes of recording and disseminating information about the ownership, value and use of land and its associated resources (United Nations Economic Commission for Europe *UN-ECE*, 1996). The processes of Land administration consist of land registration, cadastral surveying and mapping, fiscal, legal and multi-purpose cadastres and land information systems (Stuedler, Rajabitfard and Williamson, 2003). Burns *et al* (2007) pointed out that various projects to improve land administration systems have been carried out by developing countries around the world over the past half century primarily to provide formal recognition of rights in land and to facilitate the trading of these rights. Typical project objectives include one or more of the followings: reforming and strengthening policy, legal and institutional frameworks; introducing formal land-titling systems or other forms of secure tenure; improving registration practices; upgrading survey and record keeping technologies; capacity building — all in an attempt to develop more efficient and effective land administration services (Burns *et al*, 2007).

In most developing, urban land administration system is usually dual in nature resulting to a plural characteristic. This has given rise to the concept of legal pluralism where the formal land administration laws exists side-by-side with normative rules. The understanding here is that, the formal land administration laws are perceived as alien and not in tandem with the customary norms and practices. This scenario has made the successful implementation of most urban land policies very challenging without adjustment to them (Kuma, 2013). According to Burns *et al*, (2007), over the last few decades, most developing countries commenced agitations for new urban land policies and in some cases some countries have successfully adopted new and reformed land laws. Though some still lack administrative machineries to for the proper implementation, also looking at the environmental limitations and funding which have remain standout problems hence, limited results have been recorded so far.

Atilola (2010) mentioned that the main objective of the modern land administration system will be to create an open market economy in which land is transformed into an economic commodity. This implying brings in economic concept and approach into land administration system rather than the general conventional approach which is becoming popular. The UN-ECA (2003) described these conventional approaches as operating majorly on deeds and title registrations and also declared that, no developing country has a land tenure system which satisfies fully any of its objectives or objectives worthy of a modern land administration system rather most of them have what is termed “Urban Cadastre” for the economically stronger households in the society.

Finally, in spite of the huge resources invested by various governments and the donor agencies towards the improvement of land administration infrastructure in developing countries, there has been little or no systematic and sustainable approach effective development.

2.0 THE URBAN LAND ADMINISTRATION

A land administration system may include processes to manage public land, which includes records and registration private interests in land, assess land value and determine tax, define land use, and support the process of development application and approval (UN-ECE, 1996; Enemark *et al*, 2005, Ukaejiofo, 2009). It is also seen as the processes of regulating land and property development and the use and conservation of land, the gathering of revenues from the land through sales, leasing and taxation, and the resolution of conflicts relating to the ownership and use of land (Dale and McLaughlin, 1999). A land administration system may include the following major aspects:

- a) Management of public land
- b) Recording and registration of private rights in land;
- c) Recording, registration and publicizing of the grants or transfers of those rights in land through sale, gift, encumbrance, subdivision, consolidation,
- d) Management of the fiscal aspects relating to rights in land, including land tax, historical sales data, valuation for a range of purposes, including the assessment of fees and taxes, and compensation for state acquisition of private rights in land,
- e) Control of the use of land, including land-use zoning and support for the development application/approval process.

The land administration functions are relied on and are facilitated by suitable land information infrastructure that include cadastral and topographic datasets and provides access to entire and up-to-date information about the built and natural environment (Enemark *et al* 2005).

Land administration system is therefore a vital framework in the implementation of urban land policies in both developed and developing countries. It also supports the efficiency of land markets and also concerned with the management of land as a natural resource towards ensuring a sustainable development see figure 1 below.

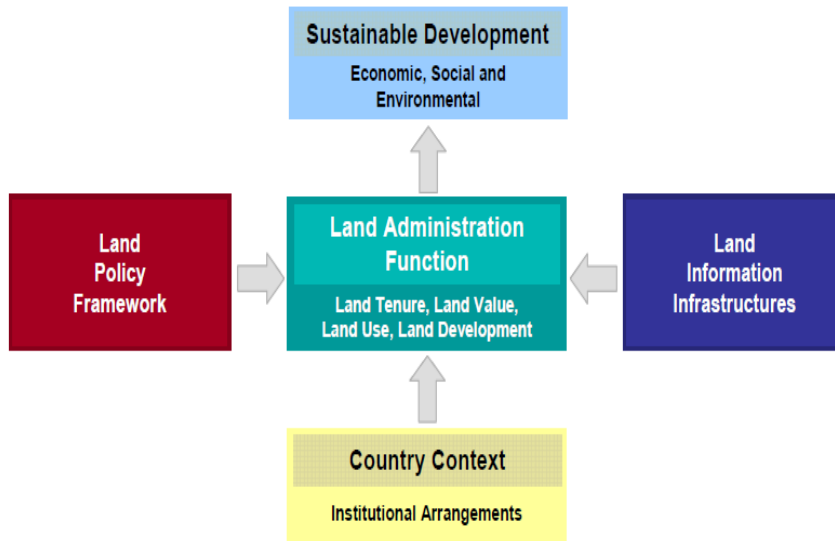


Figure 1: Land Administration System Web

Source: Enemark *et al* (2005)

The major consideration of any land administration system especially in the urban areas is to ensure equity in the distribution and access to land resources for both social and economic uses. This will involve certain processes that determine adjudication of rights and attributes of land such as surveys, description, documentation and making available this information for ease of management (Dale, 2000). Thus the main functions of land administration as enumerated as Steudler, Rajabifard and Williamson (2004) are;

1. Juridical function which deals with land ownership and property rights (land tenure)
2. Regulatory function which controls land use planning and development.
3. The fiscal function relates to land values which also include land taxation and
4. Finally, information management includes information on the other three components which is very critical for effective land management.

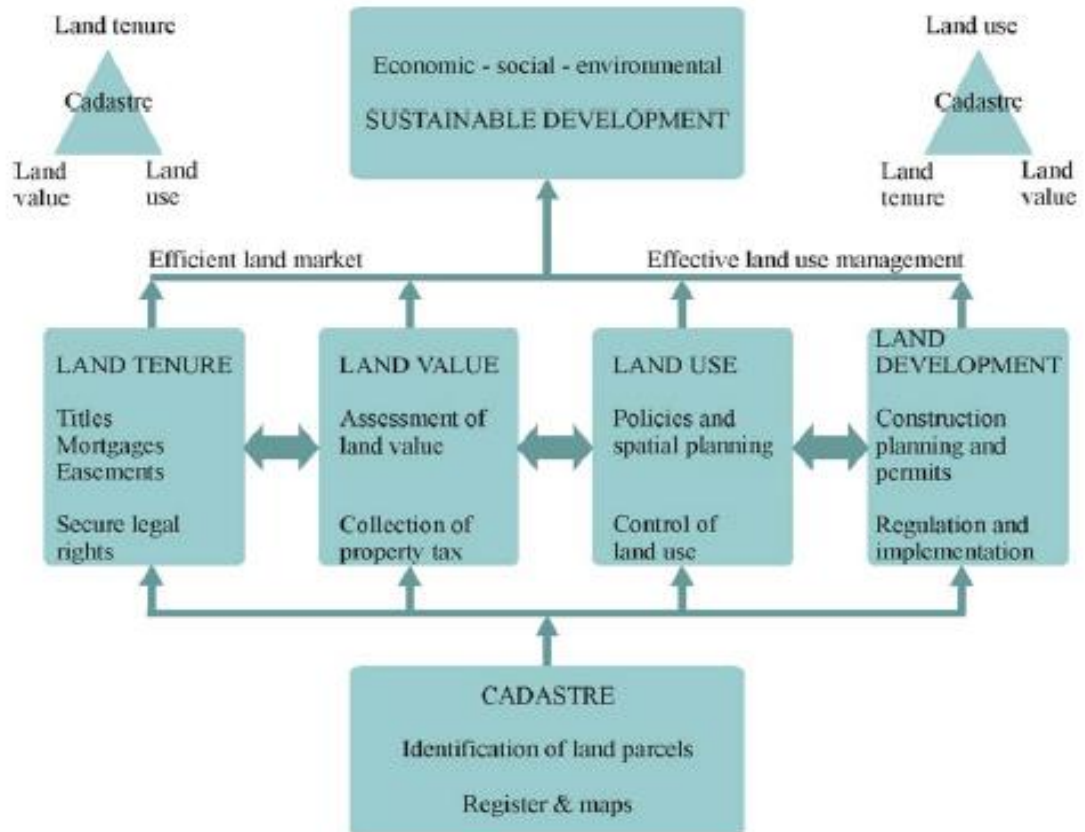


Figure 2: Global approach To Land Administration Systems

Source: Enemark and Sevattal (1999)

Enemark (2001) further explains the various ranges of subsystems that comprise land administration system as illustrated in Figure 2 above:

1. **Land Tenure System:** this is the securing, allocation and security of rights in lands. This is a legal surveys meant to determine parcel boundaries; the transfer of property or use from one party to another through sale or lease; use of land as security; and the management and adjudication of doubts and disputes regarding rights and parcel boundaries.
2. **Land Value System:** The land value system is the assessment of the value of land and properties; the gathering of revenues through taxation; and the management and adjudication of land valuation and taxation disputes.
3. **Land Use System:** this system is principally anchored on the regulatory function of land administration. It relates to the control of land use through adoption of planning policies and land use regulations at the local, national and regional levels. The land use system also executed through the enforcement of land use regulations; and the management and adjudication of conflicts emanating from the various land use types.

4. **Land Development System:** this involves the building of new physical infrastructure; the implementation of construction planning and change of land use through planning permission and granting of permits; and management of complaints and disputes.

All these land administration subsystems are interwoven following that the actual economic and physical use of land and properties influences the land uses, also the adequacy in the management of land tenure, land value and land development subsystems will lead to effective land market. The connection together of efficient and effective land market and land use administration will lead to the establishment of a sustainable approach to economic, environmental and social development. Enemark (2004) further mentioned that this system should include land registration, cadastral surveying and mapping, comprehensive natural and built environment datasets, valuation and taxation systems, land use control systems, and land development processes of regulating land and property development measures.

Enemark *et al* (2005) further explained that a modern Land Administration Systems operates within the jurisdiction of adopted land policies that fulfil political objectives with regard to land issues. It also works within an institutional framework that imposes mandates and responsibilities on the various agencies and organisations and also concerned with providing comprehensive information at the individual land parcel level and it should service the needs of both the individual and the community at large.

3.0 NIGERIA'S CURRENT LAND ADMINISTRATION SYSTEM

Nigeria's land administration system is fashioned towards a uniform decentralized approach to land use management which places the decision making on governors of each state within the territory of Nigeria. However, the efficiency in the administration of land in Nigeria is lacking due to the shortcoming of the existing land policy. The policy has been cruised for lack of socio-cultural considerations as well as its rigidity in terms of practical implementation.

Nigeria presently has up to 38 land registries at both State and Federal levels with different standards (Ukaejiofo, 2009). In addition, some local government areas also have registries within their domain with land information system that is differing from that of the state. Some states have also embarked on computerization of their land administration system some with also reforms that majorly focus on re-certification programme without taking into consideration social context of land holding system. States like Lagos, FCT Abuja, Kano and Niger have embarked on the establishment of Geographical Information System units for their land records and administration however, this is limited to mainly urban areas.

Apart from the above, the cadastral system in Nigeria is still mostly analogue with files stored and retrieved manually for cadastre related activities (Vaibhav, 2015). The cadastral survey methods employ instrumentation such as T2 and EDM/steel band for cadastral survey (Akpyoware, 2003). Most of the part of the country are poorly mapped and have outdated base maps. Some maps are based on local origin due to absence of control points and contradicting maps of the same area can emerged (Vaibhav, 2015).

4.0 IDENTIFICATION OF CHALLENGES

The following are the major challenges of land administration system in Nigeria as a developing country:

- a. **Policy Level** - According to Atilola (2010), the Land Use Act was revolutionary because it unifies and nationalizes the land tenure system all over the country. The Act leads to the creation of statutory title to land covered by Certificate of Occupancy which is issued to all leaseholders. However, the Land Use Act did not fulfil all its potential to transform the land administration system in the country due to technical, institutional, social reasons and lack of sincerity and political on the part of various governments to implement and review the Act.
- b. **Institutional Framework** – this is one of the prominent challenges to the successful land administration in the Nigeria and other developing countries. Majority of all these countries face the existence of multiple organizations all empowered by different legislations to participate in the delivery of some part of land administration cycle. Their powers often overlap and add to bureaucratic red-tape, which allows agencies to remain self-serving without regard to community needs and demands. This confusion on these processes and power play lead to the emergence of various form of forms of corrupt practices such as informal fees, cronyism among others that rule out the least able from participating in the formal land market and gaining security of tenure.
- c. **Legal framework** - characterized by a multiplicity of overlapping land-related laws, compiled over decades with little attempt to rationalize the ambiguity resulting from successive legislation. Possible conflicts between customary and/or informal systems of land tenure and state-supported formal systems of land registration are an issue in all developing countries.
- d. **Technical Issues** - Low skill levels and severe shortage of resources are technical issues common to all developing countries especially Nigeria. Also the absence of prerequisite base maps for determining the ownership of land, the non-explicit demarcation of urban and rural land and obsolete national cadastre and geospatial data infrastructure are some of the barriers to modern land administration system in a developing country like Nigeria.
- e. **Operation of Land Use and Land Titling** - the “Trustees of Land Use Act” (Governors and Local Government Chairmen) have seen the act as a political weapon leading to lack of transparency and selective administration of its provisions. The operation of obtaining title to land is also expensive and cumbersome and it is limited to urban areas.

5.0 THE WAY FORWARD:

5.1 The Development of Indigenous Integrated Land Administration System Model

The ingredients of the global integrated land administration system model (Fig 2) is the model which policy makers and government of developing countries can use to measure their existing system and serve as a tool for change. The major focal point of this model is Integration and standardization and this will enable the developing countries to look inward in modifying the existing land administration system model to suit both local socio-cultural and economic needs. The evolution of modern land information through the embracement of Information Communication Technology (ICT) and Geographical Information System (GIS) have offer essential infrastructure which serve as a gateway for quick and effective access to information and development of standard for land titling and registration processes (Ukaejiofo, 2009).

Land Information System (LIS) is a branch of Geographical Information System (GIS) which is a computer based spatial land administration system designed basically for recording and managing land ownerships, tenure and all other rights therein (Ukajejofo, 2009). Therefore, all developing countries should adopt a standardized one in managing land spatial information because of its significant to economic development and environmental management. The world is now a global village, the government and people of developing countries need to move with global changes. This is because transaction in land and landed properties is now possible online through the internet as long as it is validated.

Table I: the ingredients of an integrated Land Administration System (LAS) Model

INGREDIENTS OF THE INTEGRATED LAS MODEL	
INGREDIENT	DESCRIPTION
1. Integrated vision to drive sustainable development	Economically, environmentally and socially sustainable development (EESSD) is the policy driver for the integration of functions in Land Administration Systems (LAS)
2. Servicing e-democracy and e-governance	These are not scientific terms but refer to citizen participation and government capacity being developed in land administration through web and spatial enablement of systems. Integration for purposes of e-democracy and e-government remains the major potential deliverable of the LAS model.
3. Built on country capacity	Unique historical and cultural circumstances are incorporated.
4. Delivered through web environment	ICT enabled and spatially enabled systems.
5. Covering essential areas of land administration	Land registration, land valuation, land use planning and land development aimed at sustainable land management.
6. Universalisable	In recognition of the regional and global dimensions of land administration, the model is attractive to national governments and potentially delivers seamless regional and global information and policy support.

Source: Enemark *et al* (2005)

5.2 The Need for Re-Invention of Estate Management Profession as a Key Player in building modern Land Administration System in Nigeria

Estate Surveyors and valuers in Nigeria have always been a major player in land administration and land market operations. However, there is need to change focus from being seen very much in traditional context of operation to contemporary one that embrace ICT as a tool of professional development. It becomes imperative for real estate profession through Nigerian Institution of Estate Surveyors and Valuers (NIESV) and Estate Surveyors and Valuers Registration Board of Nigeria (ESVARBON) to encourage the members to seek knowledge in the area of ICT and GIS. The estate surveyors and valuers should also prompt to be a frontrunner in the development of modern Land

information system through the development of integrated land administration system model that will move Nigeria's system from been a "provider" driven to "user" driven. To support such a process there is needs for a valid valuation and property rating system which are core of services provided by the profession.

6.0 CONCLUSION

Mabogunje (2007) argued that government should take a firm responsible with respect to development of good and vibrant modern land administration. The inadequacies of the current land administration system in the developing countries like Nigeria still make land to remain a dead capital which locks away the economic value of land. A modern land administration system should been seen as tool that facilitate smooth operations of the land market and unlock the value.

Developing countries around the world should also re-engineer the land registration and cadastral system to meet the increasing demand placed on them by embracing new information technology as well as computerization of existing records. This is through the conversion of old analogue form to digital form so as to be in position to analyze data and monitor trends in land market. Therefore, modern integrated land administration system should be built based on the existing modified structure on ground but it must be back up with major integrated land administration system model which focus on information as a commodity to provide a modern framework that will meet demand of sustainable development.

REFERENCES

- Akpoyaware, A.O. (2003). *Towards Improved Cadastral Services from Federal Ministry of Works and Housing, Nigeria. (A Scenario for Change)*. M. Sc Thesis submitted to International Institute for Geo-information Science and Earth Observation, Enschede, The Netherlands.
- Atilola, O. (2010). *Land Administration Reform Nigerian: Issues and Prospects*. Paper presented at FIG Congress on Facing the Challenges – Building the Capacity, Sydney, Australia.
- Burns, T., Grant, C., Nettle, K., Brits, A. and Dalrymple, K. (2007). *Land Administration Reform: Indicators of Success, Future Challenges*. Land Administration Final Draft. May 2007. World Bank Report.
- Constitution of the Federal Republic of Nigeria, 1999 – Land Use Act Cap L.5, 2004.
- Cotula, L., Camilla Toulmin, L. & Hesse, C.(2004). *Land Tenure and Administration in Africa: Lessons of Experience and Emerging Issues*. International Institute for Environment and Development, London.

- Dale, P. (2000). *The Importance Of Land Administration In The Development of Land Markets - a Global Perspective*. Department of Geomatic Engineering, University College, London, England.
- Dale, P. and McLaughlin, J. (1999). *Land Administration*. Oxford University Press
- Enemark, S. (2004). *Lecture note on Land Administration Systems 2*. Aalborg University, Denmark
- Enemark, S. (2001). Land Administration Systems-A Major Challenge For The Surveying Profession. *Surveying and Land Information Systems*, 61(4):267-276.
- Enemark, S. & Sevatdal, H. (1999): *Cadastral, Land Information Systems and Planning – is decentralisation a significant key to sustainable development ?* Technical Papers of UN/FIG Conference on Land Tenure and Cadastral Infrastructures for Sustainable Development, Melbourne, Australia.
- Enemark, S., Williamson, I.P. & Wallace, J., (2005). Building Modern Land Administration Systems in Developed Economies. *Spatial Science* 50 (2): 51–68.
- Mabogunje, A.L. (2007). *Development as Societal Transformation and Empowerment*. Lecture Delivered at the Retreat of the People’s Democratic Party, Abuja, January 8.
- Stuedler, D., Williamson, I. P. & Rajabifard, A. (2003). The Development of a Cadastral Template. *Journal of Geospatial Engineering*. 5 (1): 39–47.
- Ukajeiofo, A. N. (2009). *Land Titling and Registration as Necessary Factors in the national Land Reform Programme*. Paper presented at 39th Annual Conference of the Nigerian Institution of Estate Surveyors and Valuers, Awka, Anambra State.
- United Nations Economic Commission For Africa (ECA) (2003). *Land Tenure Systems and Sustainable Development in Southern Africa*. ECA/SA/EGM.Land/2003/2. Lusaka, Zambia.
- United Nations Economic Commission for Europe UNECE (1996). *Land Administration Guideline with Special Reference to Countries in Transition*, United Nation, Geneva.
- Vaibhav, A. (2015). *Cadastral in Africa: A Leap towards Modernization*. <http://www.geospatialworld.net/Regions/ArticleView.aspx?aid=2514>