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FEDERAL UNIVERSITY OF TECHNOLOGY

MINNA, NIGER STATE, NIGERIA

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SETIC 2020 INTERNATIONAL CONFERENCE

BOOK OF PROCEEDINGS

MAIN THEME:

Sustainable Housing And Land Management

3RD -5TH MAY, 2021

SCHOOL OF ENVIRONMENTAL TECHNOLOGY COMPLEX,
FUT, MINNA, NIGER STATE, NIGERIA

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Federal University of Technology Minna, Nigeria

School of Environmental Technology International Conference (SETIC 2020)

3RD – 5TH MAY, 2021

Federal University of Technology Minna, Niger State, Nigeria

CONFERENCE PROCEEDINGS

EDITORS IN CHIEF

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PREFACE

The School of Environmental Technology International Conference (SETIC 2020) is organised by School of Environmental Technology, Federal University of Technology Minna, Nigeria. In collaboration with Massey University New Zealand, Department of Civil Engineering Faculty of Civil Engineering and Built Environment Universiti Tun Hussein Onn Malaysia, Malaysia Centre For Professional Development and Industrial Project Development School of Professional and Continuing Education (SPACE) UTM-KL Malaysia, Global Academia, Department of Architecture, Faculty of Engineering and Architecture, Istanbul Gelisim University Istanbul Turkey, Sustainable Environmental and Technology (SET) Research Group, Department of Architecture, Universiti Sains Islam. The main theme for this year conference is "SUSTAINABLE HOUSING AND LAND MANAGEMENT". This promotes and encourage innovative and novelty for policy issues for inclusive and sustainable housing, access to finance for housing and land development, sustainable building materials, building cost management, sustainable and resilient cities, geoinformatics for land management, rapid urbanization, sustainable land use and spatial planning, gender issues in access to land.

The responses from participants for this conference are overwhelming, well attended, and successful. The operation mode was Virtual for all participants who choose the oral presentation mode. While, Physical for all poster medium presenters. Our participants are from various Universities and other sector across the globe, from countries like United State for America (USA), Turkey, Malaysia, China, Saudi Arabia, Kenya, New Zealand just to mention a few. Hence, this conference provides a good platform for professionals, academicians and researchers to widen their knowledge and approach on latest advances in research and innovation. Papers presented in this conference cover a wide spectrum of science, engineering and social sciences.

Finally, a note of thanks must go to SETIC 2020 Local Organizing Committee (LOC) for their remarkable dedication in making this conference a success. We hope the event will prove to be an inspiring experience to all committee members and participants.

ACKNOWLEDGEMENTS

The effort put together in achieving the success of SETIC 2020 is predicated on the feat of the first and second edition of School of Environmental Technology International Conference held in 2016 and 2018, respectively. The support and goodwill from Vice-Chancellor of Federal University of Technology, Dean School of Environmental Technology, Dr Dodo Y. A., Dr Moveh S. and many other highly motivated people are highly appreciated.
It is also my privilege and honour to welcome you all, on behalf of the Local Organizing Committee (LOC) to the 3rd edition of the Biennial School of Environmental International Conference (SETIC 2020). This Conference which was earlier schedule for 7th to 11 April, 2020 is holding now (3rd to 5th May, 2021) due to the challenges of COVID-19 Pandemic and the ASUU-FGN crisis which made our public Universities in Nigeria to be closed for about one year. We thank God for keeping us alive to witness the great SETIC2020 event, in an improved form exploiting the new-normal situation posed by the Pandemic for a hybrid (i.e. both physical and virtual) form of Conference participation.

The conference provides an international forum for researchers and professionals in the built environment and allied professions to address fundamental problems, challenges and prospects Sustainable Housing and Land Management. The conference is a platform where recognized best practices, theories and concepts are shared and discussed amongst academics, practitioners and researchers. This 2020 edition of SETIC has listed in the program a Round Table Talk on Housing Affordability beyond COVID-19 with selected Speakers from across the globe available to do justice on the topic of discussion.

Distinguished Conference participants, permit me to warmly welcome our Keynote and Guest Speakers:

- Prof. Ts. Dr. Mohd Hamdan Bin Ahmad, *Deputy Vice Chancellor (Development) Universiti Technology Malaysia (UTM)*;
- Assoc. Prof. Dr. James O.B. Rotimi, *Academic Dean Construction, School of Built Environment, College of Sciences, Massey University of New Zealand*;
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- Prof. Ts. Dr. Zanail Abidin Akasah, *Visiting Professor on Sustainable Solar Integrated Design Building Design, International Micro Emission University (IMEU)/HIMIN Ltd. China & Senior Research Fellow, The Architects Resourcery, Jos, Nigeria*;
- Ar. Dr. Elina Mohd Husini, *Department of Architecture, Faculty of Engineering & Built Environment, Universiti Sains Islam*;
- Asst. Prof. Dr. Yakubu Aminu Dodo, *Department of Architecture, Faculty of Engineering and Architecture Istanbul Gelisim University, Istanbul Turkey*

and the five Speakers for our Round Table Talk on Housing Affordability Beyond COVID-19

- Dr. Muhammad Mustapha Gambo, *Manager, Policy, Research and Partnerships, Shelter Afrique, Nairobi, Kenya*;
- Prof. Dr. Soumia Mounir, *Department of Architecture Ecole Nationale d'Architecture d'Agadir [The National School of Architecture of Agadir], Morocco*

- Dr. Said Alkali Kori, *General Manager, Projects and Portfolio management, Family Homes Fund, Federal Ministry of Finance, Abuja*;
- Ts. Dr. Sasitharan Nagapan, *Department of Civil Engineering, Faculty of Engineering and Built Environment, Universiti Turn Hussein Onn Malaysia, Malaysia*;
- Dr. Mercy Nguavese Shenge, *AIA Assoc. Historic District Commissioner, City of Rockville, MD, USA.*

for accepting to share from their knowledge, wealth of experience and be available to interact with participants on varied issues on "**Sustaining Housing and Land Management**".
As reflected on the Conference program, the Conference activities will be Virtual for power point presenters to run in four parallel sessions on the Zoon platform while the participants for Poster presentations (mostly Postgraduate students) are expected to have their Posters displayed in the Environmental Complex Building of the Federal University of Technology, Minna. With a total of One Hundred and One (101) articles captured in the Conference Proceedings covering the seven subthemes of the Conference, I have no doubt that we are all in for an impactful experience at SETIC2020 as we brainstorm, exchange ideas, share knowledge and participate in evolving more approach to sustainable housing and land management drives.

I implore us all to enjoy every moment of the deliberations and ensure we maximize the great opportunity offered by the Conference to network for better research and career development as we also make new friends.

I also on behalf of myself and the LOC express our appreciation to the Dean, School of Environmental Technology and the entire Staff of the School for giving us the opportunity to steer the ship for SETIC2020. To the Reviewers and various Committees that served with us, I say thank you for helping us through despite the pressure of work.

Thanks, and God bless you all.

Olawuyi, B.J. (PhD)
Chairman, LOC
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PEER REVIEW AND SCIENTIFIC PUBLISHING POLICY STATEMENT

3rd MAY 2021

TO WHOM IT APRIL CONCERN

I wish to state that all the papers published in SETIC 2018 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

Babatunde James OLAWUYI
Chairman SETIC 2020
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Papers in the SETIC 2020 Conference Proceedings are published on www.futminna.edu.ng, AND ALSO SELECTED PAPERS WILL BE PUBLISHED IN REPUTABLE JOURNALS

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PROFILE OF KEYNOTE SPEAKERS AND GUEST SPEAKERS

SETIC 2020 organisers wishes to thank our keynote speakers, and Guest speakers for accepting to create time to share from their rich wealth of knowledge and interact with delegates and participants on varied issues being examined at this year's conference. A brief profile of each keynote speaker is provided here, this would allow for future interaction and networking with them.

ROUND TABLE PANEL SPEAKERS

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EXPLORING COMMUNITY-BASED FACILITIES MANAGEMENT PRINCIPLE TOWARDS A SUSTAINABLE URBAN LAND MANAGEMENT IN MINNA

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Abstract:
There are challenges with urban land management in many emerging economies of Africa. In Nigeria, one of such challenges is the existence of both customary and statutory interests in urban land. The Land Use Decree No 6 of 1978, currently known as Chap L5 LFN 2004, which empowers a state governor to acquire customary interest for overriding public interest, is faced with many challenges. Preliminary discussion from interaction with land officer at the Niger State Geographic Information System revealed that over 10% of state government layouts are currently being challenged by the natives in various courts across the state. The litigations revolve around issues of inadequate assessment index, inadequate compensation, protracted litigations arising from compensation assessments, all of which have contributed to unsustainable development of many urban lands. For holders of customary interest, there is the issue of development that lacks clear objective with regards to known planning principles, leading to slums, poor housing conditions, poor sanitation issues, incompatible urban land uses, poor property value, low environmental quality, and inability to have public utilities and social infrastructures amongst others in various communities. This study proposes a new paradigm that integrates both customary and statutory interest through community-based facilities management (CbFM) strategy to solve the urban land management problems. The study adopts a critical literature review of the core principles of community-based facilities management which include: service management, social inclusion, strategic development, economic longevity and environmental sustainability. The core values of these principles are recommended to enhance sustainable land management that will help in resolving the many challenges of urban land administration in Minna. It is intended that these principles be further tested with a range of case studies in Minna.

Keywords: Community-based facilities management, Sustainability, Urban land management, customary land ,

INTRODUCTION

Urban land management (ULM) refers to the administration of the urban area in order to enhance environmental quality, improve housing condition, environmental safety, and the value of properties (Ogundele et al., 2011). ULM is fundamental to the condition of the urban area which in turn influences economic, social and political development. The urban area is a hotbed of major economic development thereby attracting great population. Due to the unprecedented population growth, urban areas continue to grapple with numerous problems including housing, transportation, utilities and services, slum conditions, insecurity, and the general state of degradation (Turok and McGranahan, 2013; Aliyu and Amadu, 2017). The unprecedented population growth in urban area also increases the demand for development lands which are not readily available through the various government agencies that are saddled with the provision of lands.

Within the urban area, land can either be obtained from the statutory or the customary source. The statutory lands are held by the state governments who source them through the expropriation of customary interest upon the payment of compensation. The expropriated lands are planned and allocated to interested members of the public for various land uses. In most cases, the statutory land stock is rarely enough for interested members of the public. The customary lands are obtained through several means including direct inheritance, gift, outright purchase etc. Some prospective land owners who buy land from the customary sources formalise their acquisitions by applying for statutory title from the state ministry of lands. By this practice of formalising customary land holding, it is obvious that government is not involved in the planning of the allocations of the informal land market. Hence, the activities of the informal land market are not planned by the appropriate government agency.

The informal land segment is characterised by rapid growth in population and uncoordinated land acquisition activities (Magbagbeola, 1996). The land management authorities such as the urban

development board and the development control agency are not also able to control land development because of the absence of requisite information from the informal market segment. The inability of land use authorities to control the development leads to several other issues including loss of revenue, insecurity, poor environmental condition, urban slum, negative perception that discourages business creation and private investments (Alexander and Brown, 2006). The nature of these problems and their consequences have placed government and policy makers, especially land administrators in difficult positions to find lasting solutions to the issues bedevilling ULM.

Two major factors among several others hindering statutory land agencies from providing adequate land management revolves around expropriation and compensation (Birner and Okumo 2011). The two issues have led to several litigations between the acquiring authorities and the customary title holders (Shekwoaga, 2016). Preliminary discussions with land officers at the Niger State Geographic Information System revealed that over 10% of state government layouts involving several hundreds of plots are currently being challenged by the natives in various courts across the state. The litigations often take long time to resolve on account of slow judicial process. To make matters worse, illegal developments continue to spring up on disputed urban land through the informal land market, while the cases continue to delay in courts (Shekwoaga, 2016).

Consequently, basic planning rules are jettisoned, leading to the development of slums. Although the provisions of *Chap L5 LFN 2004* empowers the state governments to expropriate land for overriding public interest the exercise is often immersed in conflicts. The implementation of the provisions of the law with respect to expropriation and compensation have been contentious in many states of the federation (Omirin, 2003) including Niger state. Therefore, there is need to explore innovative strategies that will eliminate some of the challenges surrounding expropriation and compensation in ULM while enhancing a more functional urban area. This study explores the community-based facilities management (CbFM) principles with a view to developing a socially inclusive approach to ULM. The aim of the study is to evolve a sustainable urban area where ULM related litigations between government and natives is reduced to the barest minimum while reducing poverty and creating economic prosperity for both citizens and government.

LITERATURE REVIEW

Some of the ULM issues

The existence of both formal and informal land markets in African countries have resulted in different problems. Extant studies have highlighted several problems clogging the wheels of effective and rancour-free ULM (Ugonabo and Emoh, 2013; Hosaena and Austen 2016; Nwuba and Adoga, 2018). The commonest issues include the superiority of right concept which assumes that properties without statutory rights are perceived to be unsecured and less valuable than properties with statutory titles (Asabere, 2004). Due to the rapid growth in population and the limited supply of statutory land, uncoordinated land acquisition from the customary market has continued to thrive. Consequently, the development control authorities are not able to track all developments in urban area of Minna. Udoekanem et al. (2014) also highlighted bureaucratic bottle-necks in the documentation of land transactions, land registration and land titling as part of the problems of ULM. The bureaucratic control generally undermines community inputs while decisions on urban land are made through the top down approach. Also, many land expropriation programmes that over rely on executing the provisions of the land use decree without recourse to creating a diplomatic synergy with the community always face huge challenges (Cotula, et al, 2004).

UNDERSTANDING CbFM

CbFM is a strategy where all stakeholders in a community work together to plan, deliver, and maintain an enabling environment, within which the local economy can prosper, quality services can be delivered, and natural resources are protected in order that citizens can enjoy a good quality of life (Alexander and Brown, 2006). Alexander and Brown (2006) defined CbFM as the management of facilities and the delivery of services that reflects the community and environment in which they reside and operate. Hasbullah et al. (2010) affirmed that CbFM is a concept that explores opportunities for the development of a socially inclusive approach to management of facilities. Michell (2013) emphasises that the principles of FM at a "micro", singular building, scale may be applied to a "macro", urban,

scale, which can therefore create an effective standard in which to manage an urban precinct. Lilliendahl et al. (2011) argued that CbFM is a dynamic approach that can play a positive role in constructing changes in local neighbourhoods as well as facilitating innovative improvements. Nelson (2012) affirms that CbFM is a strategy that considers the impact and effects that facilities place on the existing environment, empower local communities and spread economic prosperity to improve quality of life; promote local economic development and offer more value to the community. From the various perspectives of CbFM shared above, it is obvious that CbFM encourages a bottom up rather than a top down approach to management. It is a strategy that involves all the stakeholders in the project of ULM thereby reducing the chances of litigations. The core principles of CbFM include service management, social inclusion, strategic development, economic longevity and environmental sustainability (Timmo and Nelson, 2012). These principles and their applicability in ULM are discussed in further details below.

Service management

Service Management is a concept that ensures service delivery is demand-driven. In the business world, the service management concept enables organisations to leverage service delivery as a tool to sharpen their competitive business edge (Vandermerwe, 2000). Demand-driven service delivery enhances the relationship between service providers and their customers while reducing the challenges that managers face in the course of service delivery. Applying service management concept to ULM promises a more harmonized market that response to the demand of citizens. The strategy will enhance the formation of strategic alliance between the statutory land providers and the customary land holders in urban land provision. The strategic alliance will boost the confidence of the customary land holders while mitigating negative perception that would have come with government intensions to expropriate land.

Social inclusion

Social inclusion is strategy that encourages the creation of sustainable and inclusive communities that is mutually beneficial to all persons. CbFM explore opportunities for the development of a socially inclusive approach (Hasbullah et al., 2010). Social inclusion approach ensures that community voices of diversity are recognized and heard (Inclusive Cities Canada, 2004). Sands (2006) affirmed that the concept of social inclusion provides a useful framework that can help to guide the development of comprehensive strategies that support an all-encompassing participation of community members in a given project. According to Edmonton Social Planning Council (2004), inclusiveness enhances social health and quality of life, and consequently promotes economic prosperity.

Social inclusion involves five dimensions namely: diversity, human development, involvement and engagement, relationship to living conditions, and connection to community services (Inclusive Cities Canada, 2004). Diversity involves creating communal space and opportunities, physical access, cultural recognition, income levels, etc. in which individuals feel comfortable (Donnelly and Coakley, 2002); Human development factor ensures that people are fully involved and participate in the programs and services that support the development of their communities; Involvement and engagement emphasise that people participate actively in governance and decision making. Where people are not fully involved in a program, no matter how laudable, that program will suffer some failures.

Relationship to living conditions requires that government programs and projects are geared towards addressing prevailing important community challenges like affordable housing, community safety and crime, transportation, access to child care, employment and unemployment etc. Connection to community Services dimension of social inclusion emphasises that government develops synergy with organizations that may already be part of the lives of the people that they intend to serve. This may involve the police, urban development board, traditional institutions etc. This concept of social inclusion is favourable to forming synergy among land stakeholders than overdependence on the provisions of the land use degree. All these dimensions of social inclusion are in tandem with the promotion of CbFM principles in ULM. Hence, adopting a social inclusion approach to ULM will serve as a framework that can support organizational assessment and planning, resolution of important issues as they arise, and the evaluation of ULM processes (Sands, 2006).

Strategic development

Strategic development emphasis a development process that provides a sense of direction that leads to measurable goals. It is a core factor in CbFM because it emphasises the need for community stakeholders to have continuous access and maintain resilience long after any government activity has occurred. Accessibility and resilience have common denominator in the socio-economic life of citizens. Accessibility to land plays a vital role in poverty reduction and enhancing the status of groups and individuals (Mustapha, 2007). After expropriation of customary lands, there is always problem of accessibility for the original inhabitants who owned the land. This is because there is a drastic land use change that alters the kind of economic activities (farming, mechanic, carpentry, vulcanizing etc) which use to be on the expropriated land. Hence, the displaced inhabitants become nomadic, leading to the loss of goodwill and patronage from their customers (Mustapha, 2007). The principles of CbFM envisages accessibility problem and therefore, encourages co-ownership, through removal of administrative bottlenecks, in order to facilitate a more sustainable accessibility to urban land. The CbFM principle on accessibility is also in agreement with the provisions of the 1999 Constitution which guarantee equal accessibility to land for all Nigerians irrespective of tribe, religion, occupation, level of education, political affinity and gender.

On the other hand, resilience is an assessment of how well a community or system continues to function during and after an event has occurred (Cox et al., 2015). Nelson et al. (2007) affirmed that resilience is the amount of change that a system can undergo and still retain the same controls on function and structure. The concept of resilience has been a subject of many studies including Hassler and Kohler (2014), Vale (2014), Tainter and Taylor (2014), Anderies (2014) and Bosher (2014). Hence, there are many perspectives from which previous scholars have assessed the concept. In the study by Bosher (2014), the concept of resilience was categorised into four including: resistance/robustness/absorptions; recovery/ "bouncing back"; planning/preparing/protecting; and adaptive capacity. In the case of CbFM, the major focus of resilience is on "recovery and bouncing back" because CbFM is more concerned with how the community can recover from the aftermath effect of government activities on ULM.

Economic longevity

Economic development as a core principle of CbFM emphasis the need for the people to have better economic condition long after the execution of any project in their communities. The concept stresses that government activities should bring some positive development instead of causing hardship for the people. When people participate in the development of their communities such as the construction of schools, repair of roads etc., the resultant effect is always positive on their economic development (Samad, 2002; Patrick et al., 2016). Studies have shown a correlation between community participation and rural economic development (Nekwaya, 2007; Aref and Redzuan, 2009; Patrick et al., 2016). Extant studies have reported that when communities participate with government on developmental projects, the socio-economic development of the dwellers, especially the poor people are uplifted (Laah et al., 2013). Particularly in land administration matters, extant studies recognise the importance of effective ULM in helping to alleviate urban poverty in the developing countries (Olima, 1997). Hence, the concept of CbFM perceive the enhancement of economic longevity of community inhabitants as crucial and should not be ignored in ULM programs.

Environmental sustainability

Environmental sustainability is crucial to FM and fundamental to the adoption of FM principles in community setting. Environmental sustainability factors such as air and water pollution, energy demand, solid waste generation, and many more can only achieve sustainability when the community is actively involved. Hence, CbFM recognises that the community must be involved in the planning and the execution of activities at the community level. The success of environmental sustainability is hinged on the wilful participation of the community dwellers. Considering that CbFM is the integration of people, processes and place, to develop, manage and sustain effective and efficient services, which meet the socio-economic and environmental objectives of the community, hence, the people become crucial

to the attainment of environmental sustainability. This position agrees with extant studies which argued that community participation is an important determinant of success in project performance and sustainability (Steve and Olufemi, 2011; Olaleye, 2010; and Olukosi, 2002).

DISCUSSIONS

From the foregoing, it can be inferred that adopting the principles of CbFM in ULM will ensure a paradigm shift from the current ULM practice where the supply of urban land can either be from the formal or informal market. The concept of CbFM in ULM will ensure that the supply of land is harmonized, and demand driven. The process will enable government to generate enough data for monitoring and control of development while investing the huge resources that would have been paid as compensation into infrastructure development. Furthermore, adopting CbFM principles in ULM will reduce the tension associated with expropriation and compensation on the strength of mutual understanding between the government and the customary land holders. The customary land owners will see themselves as partners in progress rather than waiting to be compensated for their interest in land. The rancour-free ULM process will avail the government the opportunity to evolve a more focused approach that guarantee measurable outcomes which can be used for further planning. It will also ensure that the socio-economic conditions of the customary land owners are enhanced because a CbFM principle encourages integration rather than outright displacement of the original inhabitants that characterise the current ULM practice. Finally, the adoption of CbFM principles in ULM will guarantee the promotion of environmental sustainability ideals with the corporation of all stakeholders in urban land.

CONCLUSION

The study set out to explore strategies through which the process of ULM can be less rancorous, in addition to reducing poverty and creating an economic advantage and opportunities for both citizens and government. The review of CbFM principles in ULM and their applicability to ULM showed that the issue of inappropriate expropriation method and inadequate compensation payment that are major issues in ULM can be avoided through the inclusive nature of the CbFM. Thus, the widespread practice of expropriating customary rights with little or no compensation will not arise . Furthermore, the needless litigations and associated expenses are curtailed while the formation of slums that arise from inadequate land management is reduced to the barest minimum. The study therefore, recommends that CbFM principles be further tested on practical case studies to further develop its applicability in real terms.

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