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FEDERAL UNIVERSITY OF TECHNOLOGY**
MINNA, NIGER STATE, NIGERIA

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B. J. Olawuyi

E. B. Ogunbode

**SETIC
2020**
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CONFERENCE

BOOK OF PROCEEDINGS

MAIN THEME:

Sustainable Housing And Land Management



3RD -5TH MAY, 2021



SCHOOL OF ENVIRONMENTAL TECHNOLOGY COMPLEX,
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**School of Environmental
Technology International
Conference
(SETIC 2020)**

3RD - 5TH MAY, 2021

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

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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*;
- Assoc. Prof. Sr. Dr. Sarajul Fikri Mohammed, *General Manager, Centre for Professional Development and Industrial Project Development School of Professional and Continuing Education (SPACE), UTM-KL*.
- Prof. Ts. Dr. Zanaail 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 Tun 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
SETIC2020

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DECLARATION

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
Federal University of Technology, Minna, Nigeria

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AND ALSO SELECTED PAPERS WILL BE PUBLISHED IN REPUTABLE JOURNALS





Appraisal of Informal Access to Land for Housing Delivery in Karu Urban Area of Nasarawa State, Nigeria

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Abstract

Failure of formal land management system to provide planned land for orderly development has given rise to alternative ways to ensure access to affordable urban land, which is informal land management. This study is aimed at appraising informal access to land for housing delivery in Karu urban area of Nasarawa State in Nigeria. To achieve this, the study identified procedures for informal land acquisition; identified determinants of access to land through informal channels; evaluated the effect of informal land to housing delivery; and examine the relationship between informal access to land and housing delivery. A total of 375 questionnaires were administered in five neighbourhoods of Karu, targeted at landholding households' head. Both descriptive and inferential statistics were employed for the research analysis. The findings revealed that there was contribution from the access to informal land to housing delivery, with a calculated value of 206.164 greater than the chi-square critical value of 9.488. The study also revealed that informal land which is 78.7% and affordability of land registration with 64.1% were the best strategies of making informal land process more efficient in the study area. Hence, the study recommends land regularization, improvement of tenure security and transparent systems in transferring land right by the government.

Keywords: Access, Informal land, Housing delivery, Urban area, Land regularization.

BACKGROUND TO THE STUDY

Land is a tangible and durable platform for socio-economic development because it supplies the platform for all human endeavours; it is vital to growth and housing delivery in any society as well as fundamental elements in property construction process. Its acquisition is necessary to achieving sustainably efficient housing delivery in urban setting (Yakub, 2014; Owoeye and Adedeji, 2015). Owoeye and Adedeji (2015) opined that access to land and rights inherent in property are essential to economic growth and advancement of any nation depending on effectiveness of land distribution amongst the people and competing urban uses. Omirin (2002) observed that acquisition of land with unconstrained access, affordability, ease of transaction as well as security of the owner's right is a tool against poverty and homelessness.

It has since been recognized that formal land markets conditioned by formal land delivery systems have been unsuccessful in providing affordable land to the urban poor (UNCHS, 1997). Formal land markets and land delivery systems tend to serve the rich who can afford the high land prices, leaving the urban poor to obtain land in the informal land markets. Meanwhile, there is no doubt the urban poor continue to play important role in the urban economy and therefore recognizing that their existence in urban areas forms an integral part of cities in developing world, it becomes imperative that alternative ways and means are devised to ensure access to affordable urban land (Agyei-Boateng, 2010). Land access and tenure security for the urban poor thus become significant in creating inclusive cities that cater for the housing need of all, irrespective of their socio-economy class.

In Nigeria, despite the existence of several laws passed to regulate and control urban land delivery access to land in particular for the urban poor through the formal mechanism has been unsuccessful. In a study carried out on informal land delivery in Karu Urban Area it was revealed that informal land delivery is responsible for the supply of 85.2% of the total built-up area (Adamu 2014). This finding is in consonant with the study carried on five Anglophone cities of Africa revealing that informal land channel provides access to land for the majority of people irrespective of their socio-economic class (Rakodi 2005). The flexibility of this method has been the catalyst for its dominant role in providing land for housing, despite its deficiency for being uncoordinated, considered illegal but socially acceptable (Adamu, 2014; Rakodi, 2005). These studies however, did not reflect the relationship between informal access to land and housing delivery in a specific context nor establishing local determinants of accessing land via the informal mechanism.

Majority of Karu urban area can better be described as a settlement characterised by high density and uncoordinated residential houses located in poor environment, and often described as slums and illegal settlements (Isma'il, Ishaku, Yahaya, Tanko and Ahmed, 2015). The reason being that these structures were built without title to land and approved building permits due to the problems of land acquisition and the bureaucratic bottlenecks in the processing of building permits. It is on these premises that, this study aimed at analysing informal access to land for housing delivery, identifying procedures for informal land acquisition and the determinants of access to land through informal channel by evaluating the effect of informal land to housing delivery and examine the relationship between informal access to land and housing delivery.

LITERATURE REVIEW

The concept 'informal' is an umbrella term, used to capture a variety of practices which vary from one context to another. Some people refer to these practices as neo-customary, others call them quasi-customary practices, and still others call them 'living law', (UN-Habitat 2010) on the other hand, the term informal urban land delivery system is used to talk about a variety of urban land transactions, exchanges and transfers that are not recognized by the state as legal, but which are nevertheless socially acceptable as legitimate by a variety of urban actors. Antwi (2002), defined informal land delivery as transactions in land outside the government legal system for which the necessary government proscriptions for formalizations have not been met. Kironde (1995) defined informal land delivery as a delivery system where the allocation or transference of land is outside the ambit of the procedures laid down by the government. Such land will usually be privately "owned" which we mean the land in question is in the control of the people who, by virtue of, for example, earlier occupation or acquisition, or by virtue of customary tenure, command recognized authority over this land (irrespective of laws that may declare all land to be publicly owned). In urban areas such land is usually unplanned.

Informal land market is a hybrid of a variety of practices and contains elements of customary/civil code law and social practices adapted to suit existing urban conditions. Although this market is, according to law, illegal, the state (or some of its agents) is often complicit in its functioning. (UN-Habitat- Urban Land Market 2010). This study therefore, considers informal land delivery system as a land delivery system that allocates, alienates, adjudicates land transaction outside formal structures of the state, but through social (customary) practices in areas declared as urban by state laws. Like the formal urban land market, informal delivery system consists of a variety of institutions which supports, facilitate,

regulate and arbitrate informal land transactions. These include state officials, such as local government councillors, traditional leaders, chiefs, community leaders, and community and family networks. Like formal markets, these regulatory bodies can be effective in facilitating exchange or can be overly restrictive and make it more difficult for (some) poor people to access land.

Keivani et al. (2008) documented the successes of informal access to land for housing delivery in countries such as Iran, Singapore, and Netherlands and Finland. They observed that the Iranian government was able to achieve land and housing market success through the expansion of the stock of low-income urban housing by directly providing land for housing construction to individuals and organizations. Iran government bypassed conventional urban land and housing markets and their associated short-comings through getting involved in public-private joint venture schemes. This approach has proved to be a more effective mechanism for promoting private sector housing provision that reaches lower income households than a process left entirely in the hands of market forces in Iran. Nkurunziza (2007) analysed and explained the nature of the institutions that are responsible for the regulation and structuring of the land delivery processes of informal settlements in Kampala. It was discovered by this author that non-state institutions are diverse in nature as a result of different normative regulation that dictated market exchange and customary practices involved in this system.

Similarly, a study carried out by Kironde (1995) which assessed the level of low-income households and communities in accessing land for housing delivery in Dares Salaam and discovered that most land was owned by the minority while majority declared willingness to acquire plots of land. The study further explained that the poor had a better chance of accessing urban land if the efforts of different actors involved in informal land delivery and system was well harnessed (Masum et al.,2016) argued that informal land and housing development was a manifestation of the absence of favourable laws and bureaucratic frameworks for formal land delivery system. They added that government should deal with such problems through a preventive approach by taking the initiative to develop a pro-poor land development policy that which will embrace poverty alleviating features and will constitute a bridge between formal and informal land delivery systems.

Remote sensing and geographical information system (GIS) has been successfully employed in monitoring and mapping urban sprawl in Karu Urban Area of Nasarawa State, Nigeria (Rikko and Laka, 2013). It was revealed that a more pronounced physical development was noticed along the highway and the settlements nearer to Abuja such as Mararaba, Karu, Nyanya and Masaka than others settlements. They ascribed this development to influx of migrant residents from other parts of the country. Owoye and Adedeji (2015) conducted a study to identify problem associated with urban land acquisition for sustainable housing delivery in Akure. It was revealed that accessing land for housing delivery in Akure is becoming highly problematic owing to increasing population growth and informal land delivery system. Oloyede et al. (2011) remarked in their work on informal land market that there was continuous patronage of the informal land market by prospective real estate investors particularly in south-western towns and cities in Nigeria over the years. They attributed this situation to the failure of the land use decree of 1978 as the major cause of the continuous growth of informal land markets and concluded that reforming the informal land market system in Nigeria could be a question of political will rather than technical approach in the interest of the masses.

Furthermore, Ugonabo and Emoh (2013) examined the major challenges militating against housing development and delivery in Anambra State of Nigeria, the study identified lack of

secure access to land as one of the factors inhibiting effective housing development and delivery in the State. However, these studies were not geared towards examining the relationship between informal access to land and housing delivery

METHODOLOGY

Karu Urban Area (KUA) is located in the territorial jurisdiction of Karu Local Government Area of Nasarawa State Nigeria, lying within latitudes $8^{\circ} 5''\text{N}$ and $10^{\circ} 42''\text{E}$ and longitudes $7^{\circ} 54''\text{E}$ and $9^{\circ} 25''\text{N}$ east of the Greenwich Meridian. Karu Urban Area is considered a planning area made up of a geographic space of about 40,000ha (NUDB, 2009). The designated area shares common boundaries with the Federal Capital Territory (FCT) Abuja, to the west, Keffi Local Government Area (LGA) to the south, Nasarawa LGA to the west in Nasarawa State and Jaba Local Government Area of Kaduna state to the north. The main urban settlements comprising of *Mararaba, Koroduma, New Karu, Nyanya Gwandara and Masaka* are the main focus of this study which includes smaller areas that have been overtaken by new urban development.

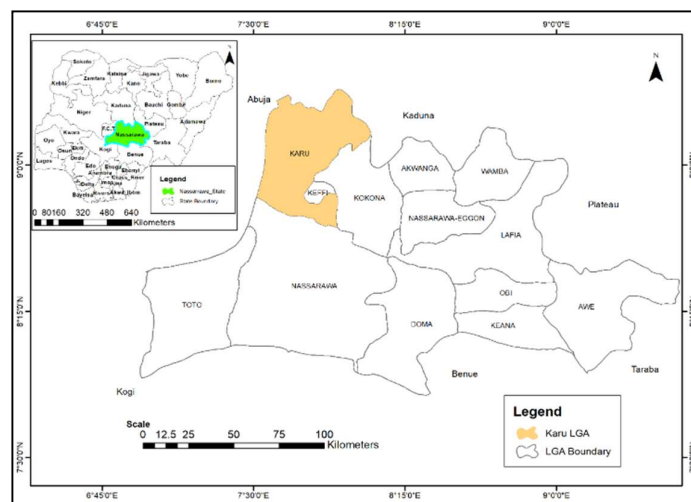


Figure 1: Karu local government area in Nasarawa State

Source: *Nasarawa State Ministry of Lands and Survey (2016)*

The study is limited to the five major residential districts of Karu Urban Area namely (Mararaba, Kuruduma, New Karu, Nyanya Gwandara, and Masaka).

The sample frame used was the households, represented by the household heads as primary target respondents. Other respondents were the sampled stakeholders that includes; the Landholding households, the registered professionals, properties agents and Estate developers. However, Simple Random Sampling technique was adopted in administering 296 questionnaires to the household heads in the residential neighbourhoods of Karu. Stratified Sampling technique was adopted in the selection of landholding households' head, agents, professionals and developers. Questionnaires were purposively administered to 15 land agents who have offices in the five different strata, three (3) from each, 15 experts (3 from each stratum) from each professional field, that is, Land Surveyors, Town Planners, the Estate Surveyors, and Lawyers, were administered questionnaire, while 15 questionnaires were administered to developers with estates in the study area. The existing procedures for informal land access was schematically represented, descriptive statistics were used to analysed the

determinants of access to land through informal channels and the effect of informal land to housing delivery, while the relationship between informal access to land and housing delivery was analysed using Chi-square test.

RESULTS AND DISCUSSION

Procedures for Informal Land Acquisition

Procedures for acquiring land in Karu as revealed from the field shows that informal lands were controlled by land holding family, individual land owners (chiefs or family heads and community land) and other actors involved. In the procedures, prospective buyers and sellers declare their interest to buy or sell land through the land agents and the process continues till the transaction is completed as shown in Figure 2.

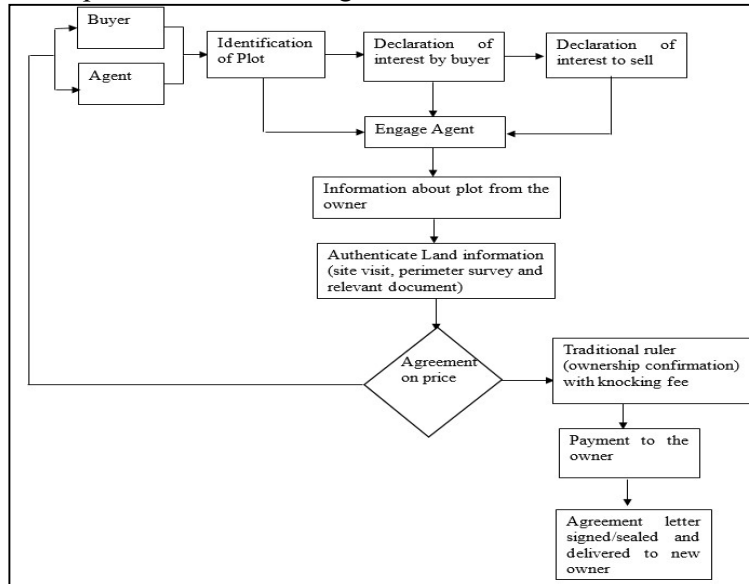


Figure 2: Flow chart for informal land access procedure in Karu Urban Area

Determinants of Access to Land through Informal Channels

One of the determinants of access to land through informal channel is affordability of Land. Figure 3, shows that out of 296 households who acquired their land through direct purchase, 54.2 % spent between ₦500,000 – ₦999,000 to acquire their land, this high percentage may be attributed to relative low cost of the informal land.

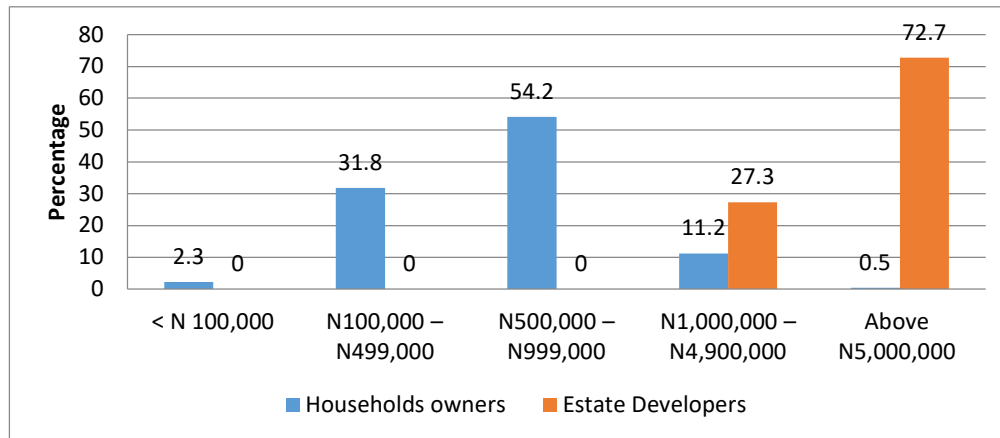


Figure 3: Affordability of Land

However, 72.7 % of the Estate developers who purchased their lands through direct purchase spent ₦5,000,000 and above to purchased their land while the remaining 27.3 % of the developers spent between ₦1,000,000 – ₦4,900,000. The price variations are also a factor of; location, size of land purchased, period of land acquisition, and channel of delivery among others. Affordability of informal land is a major determinants of access to land. It was therefore necessary for this research to verified this assertion in Karu Urban area.

Another determining factor for informal access to land in Karu urban Area is the flexibility in terms of plot sizes. The Results in Figure 4 depicts that various sizes of plots are developed by different clients. From Figure 4 it shows that 63.4 % of the 238 household owners said that their developed plot size ranges between 450sqm-900sqm while 92.9 % of the Estate developers claimed to have developed land in hectares. This indicates that most of the developed lands by individual household owners in the study area are less than 900sqm and most land developed by developers are in hectares. The implication to this is that these different sizes of plots developed are a product of magnitude of use, status and ability to purchase. However, this also informs the flexible pattern of accessing plot land through the informal channel as against the rigid nature associated with the formal channel.

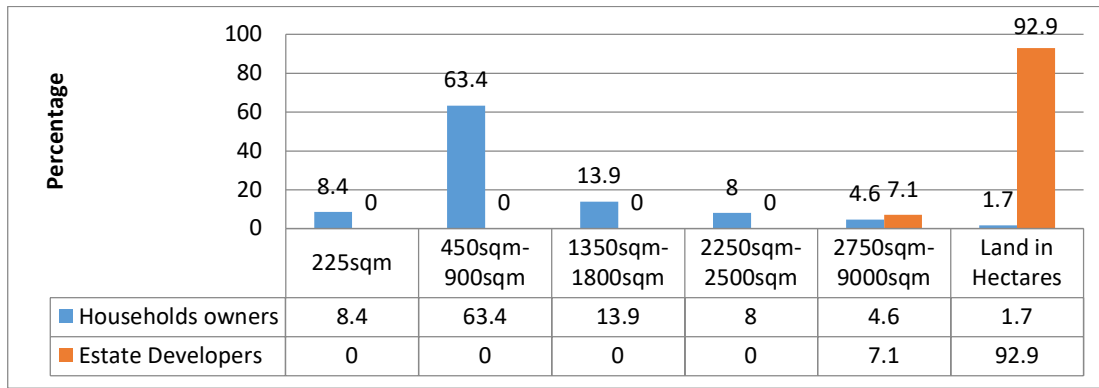


Figure 4: Flexibility of Plot Sizes

Reliability of the informal access to land for all irrespective of socio-economic status is one of the attracting factors for majority of people who access land through this channel (Rakodi and Leduka, 2003). Figure 5 shows that the households' heads and developers who said informal land delivery is absolutely reliable in the study area are 71.6 percent and 85.7 percent respectively which indicates that informal land delivery is widely accepted by the respondents.

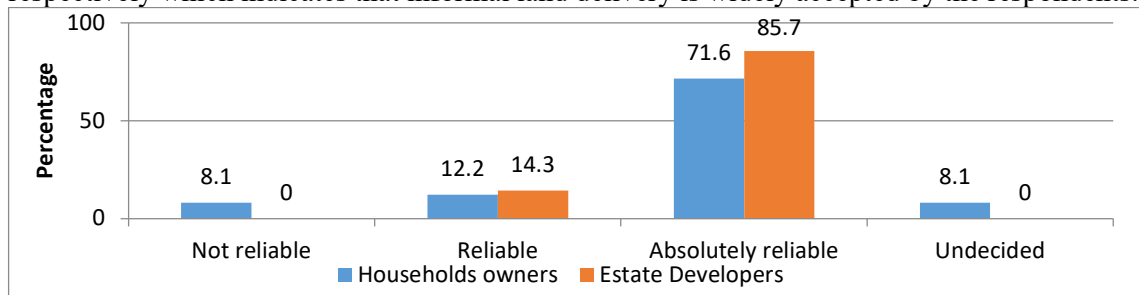


Figure 5: Reliability of Informal Land Delivery Channels

This finding therefore validates the findings by Rakodi and Leduka, (2003), that informal land has been reliable in providing solution to housing crisis due inadequacy of land.

There are other determinants of access to informal land in Karu. Figure 6 shows that 45.3 % of the household owners said availability of land through informal channel was what influenced their choice.

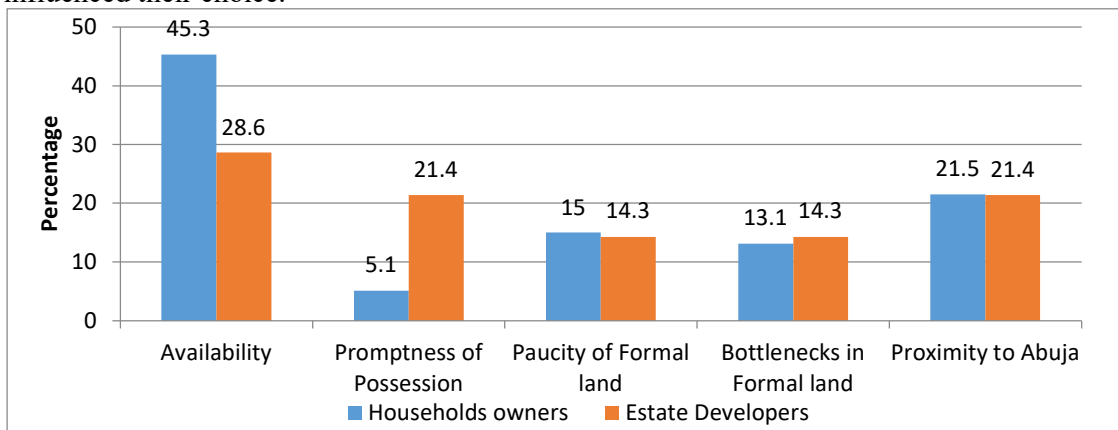


Figure 6: Other Determinants of Informal Land in Karu Urban Area

Meanwhile, 28.6 % of the Estate developers also claimed that the availability of land through this channel influenced their choice. 21.4 % and 14.3 % of Estate developers claimed promptness of possession, and paucity of formal land respectively. Likewise those who claimed bottleneck to access formal land and the remaining 21.5 % of individual house owners claimed proximity of the study area to Abuja. Other determinants that have driven the sustainability of informal land market is its ability to make readily available, prompt possession, and capacity to play alternative role of providing residential land where the formal channel has failed. This implies that some of the land users will still prefer formal land if available and easily accessible.

Effects of Informal Land to Housing Delivery

This section describes in detail the effects of informal access to land on housing delivery.

Table 1: Effects of Informal Land on Housing Delivery

	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Making Land Delivery Affordable	9	2.5	15	4.2	46	13.0	102	28.9	181	51.3
Provision of Better Alternative Access to Land	3	0.8	9	2.5	18	5.1	119	33.7	204	57.8
Provision of Land to Various Socio-Economic Class of the Society	11	3.1	15	4.2	14	4.0	120	34.0	193	54.7
Encourage Incremental Housing Development	9	2.5	15	4.2	13	3.7	161	45.6	155	43.9
Potential to Making Development Haphazard	29	8.2	110	31.2	34	9.6	128	36.3	52	14.7
Potential for Double Sale of Land	34	9.6	143	40.5	34	9.6	99	28.0	43	12.2

Results in Table 1 indicate affordability of land as one of the relationship that exists between the access to land and housing delivery. The informal access in respect to land delivery has made land relatively affordable. The findings revealed that 51.3 % and 28.9 % of the respondents strongly agreed and agreed respectively with the item. The implication of reduced cost for housing development can be attributed to relative affordability of land. High cost for land equals increase in the cost of housing construction.

This study is in conformity with studies carried out by Djeroh (2005) and Adamu (2014) who affirmed that informal access to land has provided a better alternative to land for residential development. This assertion was tested and varified to be true in Karu Urban Area and the findings are presented in Table 1. The study revealed the perceptions of respondents on whether informal land delivery has provided alternative access to land. It indicates that informal land delivery has been a better alternative access to land as 57.8% of the respondents strongly agreed and 33.7% agreed. This collaborate with the findings of Rakod (2005) and Antwi (2002) that informal land channel has provided solution to housing crisis in most African cities where the formal channel has failed.

Another significant relationship the informal land has contributed immensely to housing delivery in Karu Urban Area is in the aspect of providing access to people of various cadre in the society. This is backed up by findings shown in Table 1, which indicates that informal land delivery makes land available for the housing need of various socio-economic classes of the

society as the population of the respondents that strongly agreed with item (54.7% and 34.0%) are far higher than the respondents that disagreed. This supports the findings of Leduka, (2006) and Rakodi, (2005), that informal land delivery provides access to land for housing development for the majority of people irrespective of their socioeconomic class.

Another interesting influence of informal land access on housing delivery is the fact the system has provided avenue where developers can develop their houses at their own pace as their capital enables them. Table 1 provides perceptions of respondents whether this assertion is applicable in Karu Urban Area. This indicates that informal land delivery encourages incremental housing development in Karu Urban Area as indicated by 45.6% and 43.9% agreement rate as against 4.2% and 2.5% disagreement rate. This depicts the flexibility associated with informal access to land as it has the capacity to providing secure access to land and enabling households to construct their dwellings incrementally (in phases) as their resources allow at a significantly lower cost and convenience, than conventional public housing programmes.

Haphazard or uncoordinated development does not in any way influence the delivery of housing stock however it does relate to housing delivery in terms of the physical characteristics of the built environment. Table 19 shows the perceptions of respondents to ascertain the possibility of informal land delivery encouraging haphazard development. The Table 1 indicates that informal land delivery has the potential to make development haphazard. The population that agrees is 51% as compared by 39.4 % that disagreed. This tallies with the findings of Rakodi and Leduka (2003) that informal land transactions are susceptible to influencing haphazard and uncoordinated housing development. This can be attributed to near absence and ineffective planning mechanisms in informal land transactions.

The result also shows the respondents' perception on the potential of informal land delivery to encourage double sale of land. The responses gotten indicates that more respondents (9.6 % and 40.5 %) disagreed than the respondents that agreed that informal land delivery encourages double sale of land. This indicates that the possibility for double sale of land through the informal land access is very rare in Karu Urban Area. Hence, this attribute may not have any negative influence regarding housing delivery in Karu Urban Area. This goes contrary view to the findings of Adamu, (2014) which revealed that informal land access is susceptible to encouraging cutting corners thereby putting buyers at the risk of double payment or multiple ownership of land. The situation however is less pronounced in Karu Urban Area.

Relationship between Informal Access to Land and Housing Delivery (Chi-Square Test)

The outcomes of the respondents' opinions were tested to ascertain the validity of their claims through the chi-square test and the results shown in Table 2. The chi square calculated value of 206.164 which is greater than the chi square critical value 9.488 at 95 percent confidence interval and a significant value .000 ($p < 0.05$) posits that the null hypothesis is rejected while the alternative hypothesis is accepted and therefore indicates that informal access to land in Karu Urban Area has significant relationship with housing delivery.

Table 2: Test statistics

Chi-Square (χ^2_{calc})	206.164 ^a
χ^2_{tab}	9.488
Df	4
Asymp. Sig.	.000
a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 70.6.	

CONCLUSION AND RECOMMENDATIONS

This study concludes that informal access to land is significant in housing delivery in Karu urban area. More so, its advantage includes their ability to make land relatively affordable for housing. However, its disadvantages include potential for double sale of land, uncontrolled development of housing in the area and poor environmental conditions.

The following recommendations are therefore offered based on findings of the study:

- i. It is recommended that tenure security should be improved to make land affordable, flexible in acquisition, reliable and available for housing development.
- ii. Informal land access should not be completely disregarded as it has provided avenue for developers to develop their houses at their own pace as their capita enable them. Also, it contributes to housing delivery, this is because developers can easily acquire land, develop it and add to the national housing stock.

Since it has been established that there is positive relationship between informal access to land and housing delivery, land regularization (a strategy which aims to formalize lands which were previously under informal titles) should be adopted in formalizing lands in Karu in order to enhance title for properties, security of tenure, and freedom from eviction, and increased property value.

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