The (R) Evolution of the land registration and Cadastre in Plateau state: Towards an efficient, sustainable and secure land governance solution

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Key words: Land Registration, real estate market, land governance, land information system, property ownership, land transaction, housing market, cadastre survey, Plateau State, Nigeria

SUMMARY

The government of Plateau State (Nigeria) decided, in 2014, to give the mandate to the Ministry of Lands, Survey and Town Planning (MLSTP) to start a series of radical changes to the Land Registry and Cadastre system, because the last reform to this Ministry, prior to 2014, was insufficient to handle the growing number of land transactions and the slow pace of the procedures. As a result, this political will of the Plateau government was translated into a significant modernization initiative commenced in 2014. This comprehensive initiative focused on replacing the hybrid system consisting of mainly paper-based procedures with some components using minimum computerized tools, into a leading-edge workflow information technology solution for land registration, cadastre and also for the Town Planning department.

This paper describes the most important challenges to implement the Plateau Geographical Information System (PLAGIS) in 2014. A special attention in this portion of the paper is about the difficulties to achieve the successful implementation of the solution and also the approach to positively transform the negative institutional perception of the Ministry.

After almost four years from the implementation, it is essential to see the progress in the MLSTP by analysing and doing a comparison of essential indicators related to the behaviour of the land ownership in Jos, the capital city of Plateau State. Therefore, the fact of improving land registration is only one part of the solution to facilitate land ownership transaction, but it may positively influence the housing market, urban renewal, and land formalization.

The final section of this paper focused on the positive impact in a business indicator related to property registry by transforming the Land Registry Office in an example of land governance. The changes in reducing the duration of land property transaction created a better business environment in Plateau and a confidence of the general public in the land governance, which mitigates corruption at the government level and also in avoiding bureaucratic bottle neck.

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1. INTRODUCTION

The government of Plateau State (Nigeria) decided, in 2008, to give the mandate to the Ministry of Lands, Survey and Town Planning (MLSTP) to start a series of radical changes to the Land Registry and Cadastre system. It is important to mention that the last reform to this Ministry, prior to 2014, was insufficient to handle the growing number of land transactions and the slow pace of the procedures. This comprehensive initiative focused on replacing the hybrid system consisting of mainly paper-based procedures with some components using minimum computerized tools, into a leading-edge workflow information technology solution for land registration, cadastre and also for the Town Planning department.

The transformation of the Ministry in less than a year in 2014 was done with the political support of the government of Plateau state and key personnel of the MLSTP to the Nigerian technological firm from Lagos, Teqbridge and the support of Thomson Reuters. The solution was to implement PLAGIS (Plateau Geographical Information System), a workflow process system in the Ministry. The main challenges are described in this paper.

After four years of PLAGIS in the MLSTP, the solution has been evolved and the Plateau government has embraced the solution, mainly because of the incremental annual volume of revenue and land transactions. Other additional factors are also reviewed in this document.

To conclude, this paper focused on the positive impact in a business indicator related to property registry by transforming the MLSTP in an example of land governance. The changes in reducing the duration of issuing land property transaction created a better business environment in Plateau and a confidence of the general public in the land governance, which mitigates corruption at the government level and also in avoiding bureaucratic bottle neck.
In addition to the above-mentioned impact this document has identified the potential factors that can enhance the housing and construction market in a developing city, such as the capital city of Plateau in Nigeria.

2. THE IMPLEMENTATION OF PLAGIS IN 2014 – MAIN CHALLENGES

The archaic system used before PLAGIS 2014, was unable to conduct the typical land property procedures at the Ministry office in Jos, and the growing numbers of applicants were consistently frustrated with the numerous steps and lengthy processes. This situation constituted a main barrier for land transactions, and secured land tenure with an incipient real estate market, but with a growing demand of housing in Jos mainly due to the high rate of migration of rural population to urban centres as well as the increase number of refugees from the violent situation

in the North of the country. Therefore, the later adds an extra hurdle to land ownership because applying for a building plan approval at the Jos Metropolitan Development Board requires a proof of ownership (such as a Certificate of Occupancy) issued by the MLSTP. In addition to that, the long period of time to secure a land transaction was a fertile environment for corruption and bureaucratic bad practices at the institutional framework. The statutory Title, the Certificate of Occupancy (C of O), issued under the Land Use Act 1978, was not in production in 2014 and the Governor of Plateau held this procedure of issuing this C of O to avoid major political disruptions and create more unsecure land ownership in the Plateau State.

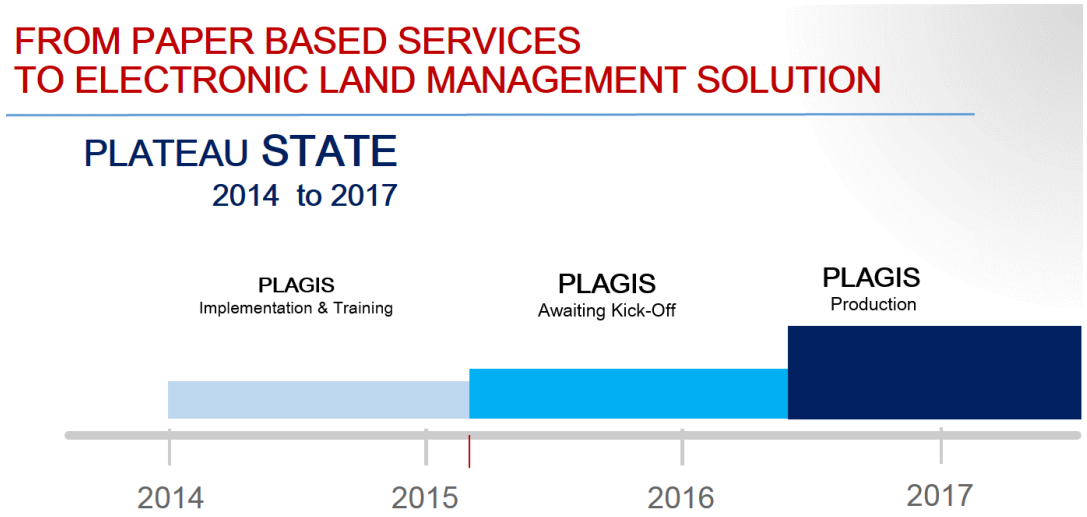

Figure 1. The evolution of the MLSTP from 2014 to date.

The Figure 1 shows the different stages of the process of setting PLAGIS at the MLSTP. The implementation was achieved in 10 months in 2014 and on early 2015, the Plateau state had a new government. From 2015 to the middle of the year 2016, the new government decided to review the PLAGIS solution and finally adopted the system after a series of testing by the MLSTP. Since mid-2016, PLAGIS is on full production and the Plateau state government has increased the revenue.

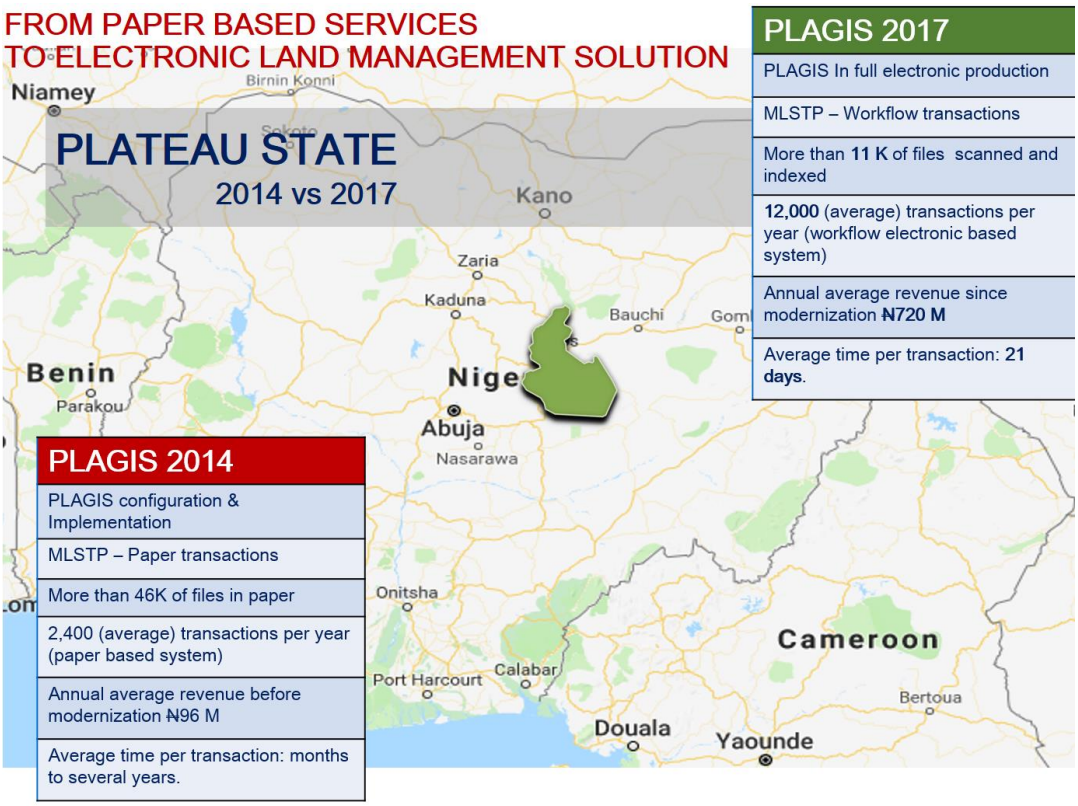

Figure 2. The Plateau state and the land administration transformation results.

The above figure display the dramatically changes at the MLSTP in Plateau, from the year 2014 to 2017. This transformation was due mainly, because of the active presence of the local company at the MLSTP and constant support to the MLSTP's staff as well as the pressure of the commissionaire and the Honourable Governor.

The transformation in the MLSTP was difficult in a sense than the majority of the officers of this ministry had a very minimal experience on information technology and working with a pile of folders with land documents were part of the day-to-day work with clear steps to pass several times the paper documents from office to office. In addition of frequent power cut a day and an excellent environment for bad practices. As a result, the implementation of a new automatic system had a very negative perception and with resistance to change.

The main challenges faced to implement PLAGIS in 2014, can be mainly summarize as follow:

i. **The MLSTP was under an important staff reorganization since 2013 and almost two third of the workforce has been deployed.**
The staff reorganization was seeking to be in line with the implementation of PLAGIS, and further staff were hired to support all component of PLAGIS system

during and after implementation. The approximately two hundred staff of the MLSTP was reduced in March 2014 to a third (around 70 officers) since 2013.

ii. **The majority of the MLSTP compound was in serious deterioration conditions.** The MLSTP compound was around 10 main buildings and only two of them were in satisfactory conditions: the Administration block and the PLAGIS building. During this time this issue was an important concern for the PLAGIS project, because the plan was to have an accessible system for all officers of the MLSTP.

iii. **The MLSTP management structure did not reflect the changes inside the ministry.**
Since 2008, the MLSTP has implemented a series of changes to improve the administration and in 2013 a massive staff deployments were accomplished. However, the main five departments formed the pillars of the Ministry, and ad-hoc sections inside each department were kept, even if the section had a lack of personnel and the efficiency was difficult to achieve. The present management structure was inadequate for efficiently run the ICT facilities at in 2014 and the concern was about the great deal of difficulty of officers to use a computerize land administration system (PLAGIS).

iv. **Some of the key transactions were unavailable and the majority of the existing services required an extremely long period of time to be processed.**
The MLSTP had not issued a Right of Occupancy and Certificate of Occupancy since 2007 expressly because of a Governor decision. The Governor placed a restriction on the processing of both type of transactions, but it was lifted in 2011. However, no C of O had been printed since. There were growing expectations in the PLAGIS solution, and the MLSTP hoped to start issuing C of O before the end of 2014. In addition, other transactions were done in a very slow pace due to limited resources (staff, technology and financial).

v. **The hybrid system at the MLSPT was partially operational in some components of few transactions, and it was considered a burden.**
In 2008, a computerized system was implemented around an IT and CAD technology to improve the MLSTP procedure of issuing R of O and C of O. However, the vision " *To become a technology driven organization that is secured, user friendly and a comprehensive provider of geospatial data infrastructure*[1]" was cut short mainly of a lack of understanding of the MLSTP business, absence of constant technical support and limited institutional capacity building plan. The solution was still used in limited transaction steps, such as to search file information, calculate the cost of a transaction, scanned land files and to digitize survey plan.

[1] Extract from PLAGIS brochure 2013

vi. **During the PLAGIS project the ministry did an entire refurbished of the building of the Town Planning department.**
As part of this project, the MLSTP refurbished the second floor of the Town Planning department building. The idea was to have a space to set the computerized system during implementation and efficiently test the six workflow processes. This floor had a server room, sufficient office space for consultants (for around 24 consultants in one section and a bigger space for the production process) and well equipped. The whole floor had a LAN and also access to Wi-Fi.

vii. **The average conditions of paper files/documents were very precarious with poor and insufficient storage room.**
The ideal change for the MLSTP was to entirely adopt the PLAGIS as a tool to give the current services efficiently and rapidly. In order to do that, the advice was that the current paper based system must disappear gradually, but in a short period of time. The paper files/documents condition was an issue to solve at the implementation stage, because of the conversion from paper to digital, where precarious and fragile paper documents can be extremely difficult to digitize.

viii. **ICT infrastructure was unsatisfactory to support a comprehensive computerize land administration system.**
The approach was to implement PLAGIS to the whole Ministry in order to be successful and all officers must be ready to be engaged on using this tool, instead of paper and other supporting equipment. It was unclear, at this moment, the MLSTP's commitment to improve the ICT infrastructure in all buildings.

ix. **The irregular city power service from the electrical company was inadequate to support an ICT system for the MLSTP and the generator was unpredictable during the day.**
This was a logistic problem, but it was extremely important to run an ICT system in such a big organization as the MLSTP. At this time, only some of the equipment were already installed in the new PLAGIS office, because of power instability.

x. **Standards, regulations and procedures were not accessible to review the condition of the Ministry.**
During the inception mission it was rather difficult to get the current standards, regulations and procedures that govern the MLSTP, by the exception of the Land Use Act of 1978. Other laws and internal regulations were impossible to find in the MLSTP, such as the Land Registration Act, the Urban Planning Law, etc. The absence of procedures and regulations to manage all MLSTP transactions raised an important concern during the first stage of the project because of the time to validate all transaction with the MLSTP staff.

The above-mentioned challenges were of course an important concerned to the PLAGIS implementation team, but the solution was able to be deployed on time, mainly because of the key personnel at the MLSTP and political will and support of the Honourable Governor of Plateau State as well as the MLSTP's commissioner.

In addition, of the technical challenges identified above, there were additional issues during and after the implementation process at the MLSTP, such as lack of political will, inadequate infrastructure, inadequate qualified work force, too much red tapes in the processing of documents and curbing corruption amongst others as challenges. The list below represents the most important challenges faced by the implemented firms during and after 2014:

- There is the paucity of data to determine rates in different locations based on size and Land use as well as for planning within the Jos metropolis, Nigeria
- Institutional deficiency owning to the fact that there is not synergy between the three tiers of government, even though the LUA, 1978 and now CAP NO. 5 LFN, 2004, is a major hindrance in the achievement or having an effective institutional framework for Jos metropolis, Nigeria.
- Inadequate work force to carry out the activities of the project. (Experts, qualified craftsmen and interns).
- Bureaucratic bottlenecks and red tapes, delay the approval of titles (C of O and R of O).
- Development of land without approval from the regulated body
- Inadequate provision of funding for the enforcement regulations agencies
- Land has not yet been nationalised, hence the challenges of haphazard development in most areas of the metropolis.
- The positive impact in a business indicator related to property registry by transforming the Land Registry Office in an example of land governance and revenue generator from increasing land transactions and for the recovery of the public confidence in the institution.

3. THE EVOLUTION AND IMPACTS OF PLAGIS IN LAND ADMINISTRATION AT THE MLSTP

After almost four years from the implementation, it is essential to review the progress in the MLSTP by analyzing and doing a comparison of essential indicators related to the behavior of the land ownership in Jos, the capital city of Plateau State. Therefore, the fact of improving land registration is only one part of the solution to facilitate land ownership transaction, but it may positively influence the housing market, urban renewal, and land formalization. This issue related to the impact of the (r) evolution (drastic changes) of the land registry and cadastre in the real estate market and the volume of land registration in Jos is analyzed from several sources after the modernization:

1. Increases in issuing the C of O - More landowners with formalized ownership are requesting the building plan approval at the local government.

2. Decreasing the processing time for land registration -This allow handling of more processes at the same time and builds confidence with landowners and builders.
3. Impact in the mortgage lending and home subsidy- Increasing the access to legal and secure ownership documents allows the financial institutions to consider the C of O as collateral and facilitates housing loans.
4. Reductions of land informality - A significant percentage of the plots or occupied land are now on the process of formalization, mainly because of the speed process in issuing the C of O.
5. Impact of property prices – The increasing volume of legal ownership allows having a more offer and generates a vibrant real estate market.
6. Increase on land building plan approval - The new dynamic land governance at the State level indicates that construction permits are revitalized.
7. Boost in requesting more land surveying to control the risk of flawed land registration- The cadastre/mapping component of the PLAGIS solution was essential to avoid land registration risk by locating the plot in the map.

The MLSTP facilitated some statistics to highlight the above-mentioned positive changes to reaffirm that the PLAGIS tool is heading the route of an efficient, sustainable and secure land governance system. Firstly, the impact on revenue generation in the MLSTP could be seen in the table 1. Total number of registration at the MLSTP and total value of transactions (revenue generated by the MLSTP).

Table 1: Total Number Of Registration & Value Of Transactions (Revenue Generated By The MLSTP)

Year	Total number of registration at the MLSTP			Total value of transactions (revenue generated by the MLSTP)		
	Total Number of first registration (C of O) Applications	Total number of parcels in the database	Total number of parcel plan in database.	Revenue from issuing of CofO	Revenue from other type of transactions	Revenue from survey plan (plots)
2013						
2014		696	696	23,987,160.51	120,990,133.14	19,770,299.01
2015		3534	3534	2,059,322.04	66,647,020.10	9,436,423.01
2016	255	603	603	48,737,986.62	160,508,690.94	9,517,797.27
2017	1240	1111	1111	340,813,994.69	683,298,465.04	190,330,567.11

Source: Ministry of Lands Survey and Town Planning, 2018

Table 1 shows the total number of applications received, total number of parcels in the database, total number of parcel plan in database and value of transactions (revenue generated by the MLSTP. The table displays that there is improvement in the revenue generated by the MLSTP. This is due to the introduction of an improved system of **registration at the MLSTP and its subsequent** value of transactions (revenue generated by the MLSTP).

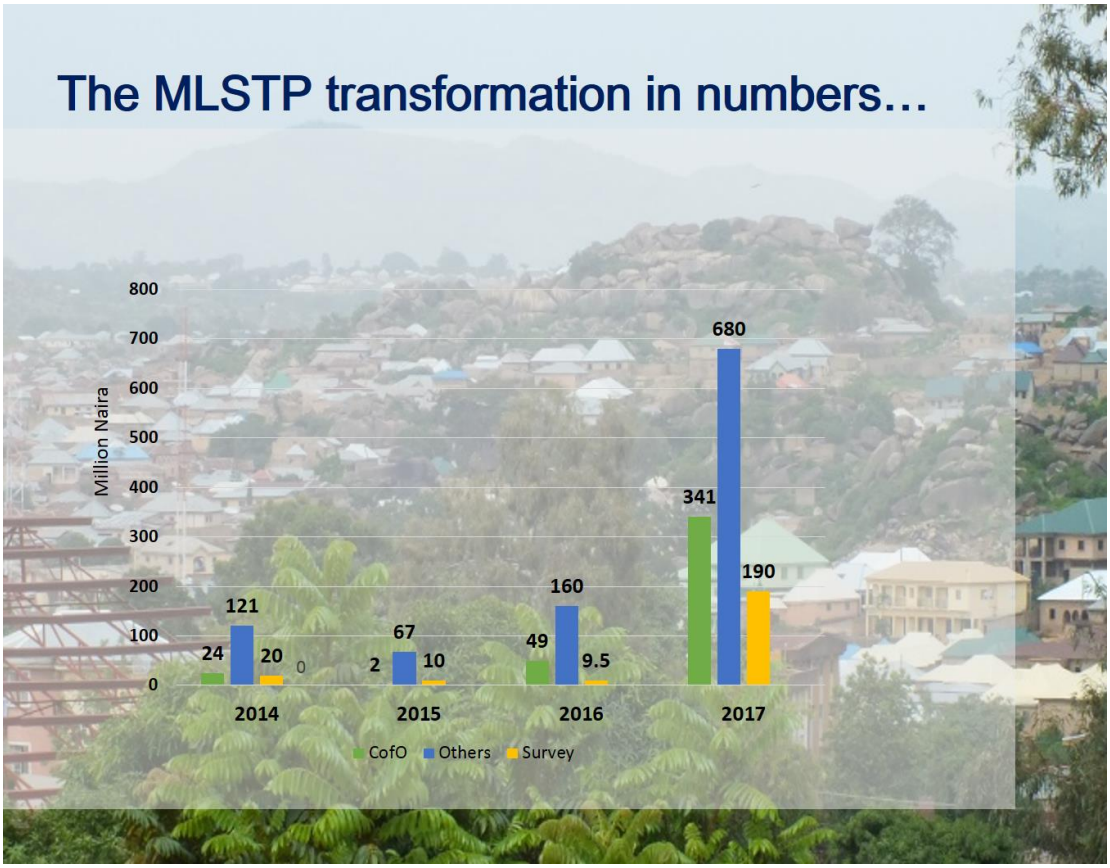

Figure 2. Revenue collected by the MLRS from 2014 to 2017.

Figure 2 graphically displays the results of table 1, and dramatically demonstrate the enormous changes in revenue achieved by using the PLAGIS approach. It is of course a good step forward for the Plateau state government, but the technical issues are minimum compared with the political obstacles to maintain a solution in place.

Table 2: Snapshot of Performance for 2016 and 2017 by no of applications and CofO issued

RIGHT OF OCCUPANCY APPLICATIONS RECEIVED IN 2016-2017

YEAR	NUMBER	PERCENTAGE
2016	252	17%
2017	1239	83%
TOTAL	1491	100%

RIGHT OF OCCUPANCY ISSUED IN 2016-2017

YEAR	NUMBER	PERCENTAGE
2016	36	24%
2017	117	66%
TOTAL	153	100%

CERTIFICATE OF OCCUPANCY APPLICATIONS RECEIVED IN 2016-2017

YEAR	NUMBER	PERCENTAGE
2016	255	17%
2017	1240	83%
TOTAL	1495	100%

CERTIFICATE OF OCCUPANCY ISSUED IN 2016-2017

YEAR	NUMBER	PERCENTAGE
2016	101	25%
2017	298	75%
TOTAL	399	100%

The above-finding represents the transparent delivery of land services on the PLAGIS platform, there is an effect on other transactions as clients are now willing to complete their hitherto stalled process with the view to coming on board the PLAGIS platform which is proven to be more secure.

Table 3: The results of these interviews with Land Vendor and some government officials in Jos Metropolis, Nigeria (Before the project, 2013)

SN	Questions	Land Vendor	Government Officials
1	What can you say about the approaches to land administration in Jos Metropolis?	Before now the approach and treatment meted on clients was according civil services procedures	The government officials still desire that the civil service approach is applied.

2	Can you please give us an estimate of the funds you were able to generate prior to the improvement and after?	More funds before improvement and less after improvement due to the strike procedures and processes adopted	We are happy that we can generate more revenue from the project.

Source: Authors Field work, 2018.

This statistic in Table 3 is supported by additional face-to-face interviews with land vendors and top land government officials along with revenue documents from both Ministry of Lands Survey and Town Planning and the Plateau State Board of Internal Revenue Services (PSBIRS).

Now, plans are being made to make available more plots via layouts preparation thus yielding increasing revenue generation, which will assist policy makers, academics and practitioners in the area of land markets, and revenue generation.

Finally, it could be observed that after the introduction of the improved Registration of Land rights, government revenue generated further increased as special considerations in terms of varying rates based on location, size, purpose and the availability of infrastructure. It would be good see tables 2 & 3 on rates based on size, location and land use.

4. THE LAND REGISTRATION BENEFICIAL FACTORS IN THE HOUSING AND CONSTRUCTION MARKET

PLAGIS had positively influenced the land markets and revenue generation at the Plateau state government since the end of 2014. In this paper, the authors gathered some essential data from the government and face-to-face interview with land vendors, top land government officials, as well as public revenue documents from both Ministry of Lands Survey and Town Planning (MLSTP) and the Plateau State Board of Internal Revenue Services (PSBIRS). The qualitative data obtained were reviewed using thematic/content analysis and the quantitative data were evaluated using simple percentages and presented using charts and diagrams.

The real property markets in most developing countries have very low information on data. This makes it almost impossible to determine and even monitor the market. The case is not different in Jos metropolis, Nigeria but gradually changing with the introduction of a system that could determine, examine and monitor the market. With the new system, we could notice albeit slowly improvements in the land markets and government revenue as evident in Real property market size and transactions. See table 4 below for transactions approved within a respective year.

Table 4: Real property market size and transactions

Year	Total number of transactions (from realtors agencies)			Total
	Number of vacant land	Number of dwelling	Number of building, (commercial, industrial or others)	
2013	-	86	6	92
2014	-	76	20	96
2015	37	50	16	103
2016	53	53	27	133
2017	156	56	22	234
2018				**48**

Source: Ministry of Lands Survey and Town Planning, 2018

Table 4 explains Real property market size and transactions as well as the improvement of the system for monitoring land market while PLAGIS was put in place. The information on Real property market size (actual) is not available, as many properties have not been registered even though they exist on ground.

It further provided information on the total number of transactions (from realtor agencies). Under this, the number of vacant land is not available for the period under review. The number of dwellings and number of buildings (commercial, industrial or others) was available. This result is not good at all, even though in a related study by Mallo, et al, 2015 shows that this period (2013) is when public awareness campaign was initiated and completed (see table 5).

Table 5: Timeline analysis of land reform implementation in Jos from 2008 to 2014

Year	Reform Component/Activity	Assessment of Implementation		
		Completed	Ongoing	Pending
2008	Initiation of the land reform programme	√		
2008	Development Plateau State Geographic Information System (PLAGIS)	√		
2009	Updating of land re-mapping		√	
2010	Commissioning of PLAGIS	√		
2010	Training of officers		√	
2010	Transfer of existing land record into the PLAGIS			√
2013	Public awareness campaign	√		
2014	Commencement of issuance of land titles using the new electronic platform			√

Source: Authors' Analysis and Compilation (2015)

The land markets before the introduction of an improved land rights registration were identified as cumbersome, not transparent and inefficient and were thus uncertain and difficult to predict, if at all. See Table 66 below.

Table 6: Old Processing Fees For Right Of Occupancy (Land Forms, Processing, Site Inspection, Infrastructural Provision)

Land Use	Fees charge for processing
Residential	**N25,000.00**
Commercial	**N42,000.00**
Industrial	**N67,000.00**

Source: Ministry of Lands Survey and Town Planning, 2018

Table 6 above shows old processing fees for right of occupancy (landforms, processing, site inspection, infrastructural provision). This is done without any adequate break down because it was cumbersome, not transparent and inefficient and thus it is uncertain and difficult to predict. The clients are always reporting that the payments are not clear.

Whilst, this was the case before the introduction of the improve system see Table 7.

Table 7: New Processing Fees For Right Of Occupancy And Certificate Of Occupancy

S/N	DESCRIPTION	AMOUNT
1	Premium of C of O fee	
2	Survey fee	
3	TDP Fee	
4	Plan Lodgment	
5	Application Form Fee	
6	Infrastructure Provision Levy	
7	Issuance Fee for C of O	
8	Registration of C of O	
9	C of O Processing Fee	
	TOTAL	

Source: Ministry of Lands Survey and Town Planning, 2018

Table 7 shows the new processing fees for right of occupancy and the approved fees for each of the items; Premium of C of O fee, Survey fee, TDP Fee, Plan of Lodgement, Application Form Fee, Infrastructure Provision Levy, Issuance Fee for C of O, Registration of C of O and C of O Processing Fees. This has made the process less cumbersome, transparent and efficient and thus its certain and very easy to predict for every location, size and land use. The corresponding fees for each of the services in table 8 were not listed because they vary by size, use, location and other requirements.

Furthermore, this innovation has proven that there are varying degrees of benefits to business, social, cultural and political. It shows the encouraging business benefits on the land market and government revenue after delivering the upgrade of the Plateau Geographical Information System (PLAGIS) in 2015.

Table 8: List Of Business Benefits Accrued From The Upgrade Of PLAGIS

Serial Number	Name on Title	R of O No. (Not real)	Diamond Bank Branch
1	NOT 0001	PL 00001	Bukuru
2	NOT 0002	PL 00001	Bukuru
3	NOT 0003	PL 00001	Bukuru
4	NOT 0004	PL 00001	Commercial Area
5	NOT 0005	PL 00001	Commercial Area
6	NOT 0006	PL 00001	Bukuru
7	NOT 0007	PL 00001	Commercial Area
8	NOT 0008	PL 00001	Bukuru
9	NOT 0009	PL 00001	Commercial Area
10	NOT 00010	PL 00001	Commercial Area
11	NOT 00011	PL 00001	Commercial Area
12	NOT 00012	PL 00001	Bukuru
13	NOT 00013	PL 00001	Bukuru
14	NOT 00014	PL 00001	Club Road
15	NOT 00015	PL 00001	Club Road
16	NOT 00016	PL 00001	Bukuru
17	NOT 00017	PL 00001	Bukuru
18	NOT 00018	PL 00001	Bukuru
19	NOT 00019	PL 00001	Commercial Area
20	NOT 00020	PL 00001	Commercial Area

Source: Ministry of Lands Survey and Town Planning, 2018

Table 8 is an indication of the mortgage transactions since the launch of PLAGIS to date between some property owners and Diamond Bank. It should be noted that Diamond Bank is

just one out several financial institutions in Jos, Plateau State. There are many other similar transactions with other banks

This is one of business benefits derivable from the upgrade of PLAGIS. This is real business benefits documented by name on title of R of O No. (not real) and the corresponding Bank which was carried out by MLSTP (PLAGIS).

The document also analyses the context of the problem by reviewing the creation of transparent land governance, as well as the evolution of the solution to bring more sense to provide secure, scalable and sustainable land information system in Plateau.

The system is secure as it does protect the right of the client (land owners) as information provided is added to the profile of the owner and stored in a system that can be traced without difficulty (stored, retrieved and backup used). Here each geo-referenced location based on the property is tied to the property owner. In the event of the sale of a property to another, there will be assignment (single transaction) and the details about the new owner tied completely to the property.

This system brings about scaling at various levels. The properties (Land) based on land use (Residential, Industrial, Commercial, Recreational, Agricultural, etc.) location; of High, medium and low density in Gwafang, Kalambie, Gurantop, Dung, Gold and Baze amongst others see table 9.

Table 9: Layout Designed And Undergoing Implementation By The Ministry

S/No	NAME	YEAR	LOCATION	TOTAL PARCEL
1	Buzumi	2014	Jos East	65
2	Little Rayfield	2015	Jose South	49
3	Doi Phase 1	2015	Jos south	34
4	Tewotebo Phase 1	2016	Bassa	212
5	Kuru	2016	Jos South	972
6	Agingi Phase 1	2016	Bassa	99
7	Agingi Phase 2	2016	Bassa	420
8	Lake view Rayfield	2016	Jos south	56
9	Doi Phase 2	2017	Jos south	23
10	Rassa, Rayfield	2017	Jos south	33
11	Fwapwa Rayfield	2017	Jos south	83
12	Airport View2017	2017	B/Ladi	80

S/No	NAME	YEAR	LOCATION	TOTAL PARCEL
13	Yelwa Club	2017	Jos south	33
14	Gwafang	2017	Jos north	345
15	Tewotebo Phase 2	2017	Bassa	400
16	J. D. Gomwalk Boulevard	2018	Jos north	53

Source: Ministry of Lands Survey and Town Planning, 2018

The size of property (Land) can be either 50x100m or 100 x100 within each layout. The indicators (Attributes) of payment are dependent on the availability of infrastructure (facilities, Utilities and services) within the zones.

The essential indicators of the behaviour of land market in Jos dependant on the availability of basic infrastructure and the forces of demand and supply.

5. LESSONS LEARNT AND RECOMMENDATIONS

Based on the experience gained during and after PLAGIS's implementation, it is important to highlight the main lesson learnt as well as the recommendations to set this type of solution.

The approach to implement PLAGIS in Plateau state in 2014 faced a multitude of obstacles that most of the solutions require to be aware in order to successful achieved the implementation and later the engagement of the government to continue using the solution. As a result, the implementation of a land administration solution should consider the following potential constraints:

- Expect to have political changes in the government – This is the most difficult situation that a solution should face during or after implementation. It is important to convince the new government of the sustainability of the land administration system.

- Endemic corruption at the ministry level – It would be a resistance to change before, during and after implementation. As a result, the government should be committed to face this situation from the start of the project.
- Staff needs government support during and after implementation of the solution – The lack of support from the government will allow to use bad practices even with the solution in place.
- Training and retraining is needful to bridge the gap of inadequate work force to carry out the activities of the project and when the system will be up and running (Experts, qualified technicians and interns).
- From paper based services to digital land management solution – To avoid resistance from staff with year of experience providing paper-based services it is essential to ensure all records digitized before start production with the land management solution.

Finally, in order to achieve a successful implementation and government engagement to use the solution towards an efficient, sustainable and secure land governance it is advisable to bear in mind the following suggestions:

- The system should generate a significant revenue compared with the former solution.
- Local partners are key to understand the client and monitoring the operation of the solution after implementation.
- Adequate provision of funding for the enforcement regulations agencies is vital.
- Legislation and government framework to support the new land administration solution need to be in place and flexible.
- The technology is a tool to enhance civil servants services and secure transparency.
- Political will is essential to achieve and secure the sustainability of the solution.
- Public awareness campaign is extremely important to engage the public and have trust to the government institution.

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BIOGRAPHICAL NOTES

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Chiemeka is the Chief Executive Officer and founder of Teqbridge Limited. He possesses well-rounded and concentrated information technology experiences spanning over 23 years with speciality in emerging technologies. After graduating from the University of Nigeria with a degree in Computer Sciences, he started his career at the Nigerian Gas Company (a subsidiary of NNPC). Chiemeka left NGC after a year to join an IT consulting firm called Ideal Concepts as a Network Specialist.

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Chiemeka left Tara for Computer Systems Associates Limited (CSA) as Sybase Products Development Manager for West Africa. He held this position before moving to Solix Technologies Limited as the General Manager, IT Solution Designs & Delivery and was responsible for all technology solutions of the company. He later left Solix Technologies as Executive Director to midwife Teqbridge Limited as the pioneer and current Chief Executive Officer.

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