

# **Systematic Land Titling and Registration in Nigeria: Geoinformation Challenges**

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**Key Words:** Access to Land, Cadastre, Systematic Titling, Geoinformation/GI, Land Reform

## **SUMMARY**

The Land Reform aspect of the Transformation Agenda of the Federal Republic of Nigeria and the mandates of the Presidential Technical Committee on Land Reform (PTCLR) are presented and briefly discussed. The pivot of the land reform agenda is the systematic land titling and registration of all land parcels in Nigeria with a view to creating a land market economy, towards empowering the rural dwellers whose asset, land, is currently locked up as “dead capital” due to lack of relevant titles. The country is poorly mapped and there is the dire need for large scale topographical database, thus making geoinformation and cadastration the central issues in systematic land titling and registration.

The paper looks into and discusses the challenges of geoinformation, cadastral mapping, systematic survey, boundary systems and boundary demarcations as they relate to systematic land titling and registration in Nigeria. It is recommended that adequate mapping of the entire country and creation of digital topographical database be carried out to drive the land reform process; and that the fixed boundary system is adopted using GNSS and the CORS established nationwide for data capture. The need to involve relevant professionals and use best practices in the implementation of the systematic land titling is underscored.

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## **1. INTRODUCTION**

The land of any nation is the most valuable natural resource. It supports all human activities and it is from it that all other economic resources are derived. In a broader sense the term 'land' includes all physical elements in the wealth of a nation bestowed by nature. As an asset, it includes anything: on the ground, above the ground, and under the ground, down to the center of the Earth. In some cultures there is a lot of attachment to land and it is held as ancestral linkage that grows from generation to generation. It is the most important but finite capital for development. It can hardly be renewed or increased without adverse consequences, and therefore must be judiciously and efficiently managed in a sustainable manner and governed by laws and regulations for equitable use of all. For this reason many nations of the world had evolved various land tenure and land reform systems for effective and sustainable development of their respective nations, (Atilola, 2011).

The extant laws governing land tenure systems in Nigeria is the Land Use Act (LUA) which was promulgated in 1978. Before 1978, different land tenure systems existed in the north and southern parts of the country. In the south it was a mixture of English freehold system and customary land tenure system; while in the north land was vested in the respective state Governors with individuals having usufructuary rights. The LUA was enacted to harmonise the various land systems in the country and to ensure that all Nigerians have easy access to land. To this end the Act nationalised all lands in Nigeria and vested the land in the territory of each state on the State Governor to hold in trust for the citizens. The Act created statutory right of occupancy for a term of 99 years in urban areas, and a customary right of occupancy for unlimited term in rural areas; made provision for the registration of statutory right of occupancy but not for the customary right of occupancy. The registration of the statutory right of occupancy is carried out sporadically as there is no provision for systematic land titling. In effect land titling is effectively limited to urban areas of the country.

## **2. NEED FOR LAND REFORM IN NIGERIA**

Land is a natural asset of the common man which government should help in converting to capital and means of empowerment. The land Use Act with all its potentials and promises to transform the land tenure system in the country did not work as intended for various technical, institutional and socio-cultural reasons as well as lack of political will on the part of various government. In addition to the several flaws of the Act, its implementation is concentrated on titling of land in urban areas which constitutes about 3% of the country's national space.

Since the introduction of English freehold system in Nigeria in 1861 and the commencement of formal land registration 1883 only about 3% of the land in Nigeria has been registered.

Thus, about 900,000.00 square kilometres of Nigerian land is effectively locked up as “dead capital”. It is this low level of land titling that accounts for the high level of poverty in the country as it is not possible to fully harness the potentials in land without title deeds. The philosophy of the Land Use Act that all land belongs to the state and should be held in trust by the governor for the people, and that undeveloped land has no value, constitute a great obstacle to the development of a dynamic market land economy and therefore needs to be addressed for the current initiatives of unlocking the commercial potentials of land in Nigeria to be realised, (Atilola, 2010).

The current dysfunctional nature of land administration dynamics, and concerns arising from its unproductive nature, as noted herein, accounts for the need to provide a better strategy that will make land administration work and also provide benefits to all citizens of Nigeria. It is in an attempt to assist the rural dwellers in turning their assets (land) to capital by granting of titles to their land that the federal government, in April 2009, set up a Technical Committee on Land Reform with a mandate to address the shortcomings of the Land Use Act and creating a much needed land market economy.

### **3. THE LAND REFORM PROGRAMME**

The Federal Government of Nigeria on Thursday 2<sup>nd</sup> April, 2009, inaugurated the Presidential Technical Committee on Land Reform (PTCLR). The Committee's terms of reference include, among others are:

- To review pre-Land Use Act and land tenure in existence in different parts of the country with a view to putting the land tenure system in Nigeria into a historical perspective.
- Collaboration with and provision of technical assistance to states and local government areas to undertake land cadastral nationwide.
- Determination of individuals' “possessory” rights using best practices and most appropriate technology to determine the process of identification of locations and registration of title.
- Ensuring that land cadastral boundaries and title holdings are demarcated in such a way that community, hamlet, village, town etc will be recognizable.
- To assist and encourage States and Local Governments to establish an arbitration mechanism for land ownership conflict resolutions.
- To establish a National Depository for Land Title Holdings and Records in all states of the Federation and the Federal Capital Territory.
- To establish a mechanism for land valuation in both urban and rural areas, in all parts of the Federation and
- To undertake any other activity that will ensure an effective, simplified, sustainable and successful land administration in Nigeria.

The Committee is charged with the task of establishing a roadmap for improving existing institutional and legal framework of land tenure with a view to developing a land market economy for the country. The terms of reference of the Committee forms a framework from which a comprehensive land policy and management are to be formulated for the nation.

## **4. IMPLEMENTING THE LAND REFORM**

In pursuance of its mandate as set out in the terms of reference stated herein, PTCLR, recognises that, to effectively and efficiently achieve the main goal of the land reform, which is to empower Nigerians from all walks of life to have easy access to secured title to land, the systematic land titling and registration (SLTR) system of land titling must be adopted. This is the system that has been adopted worldwide by other countries that have embarked on land reform since the 1980s. Countries in Africa that are currently implementing the systematic land registration system include Rwanda, Ghana and Botswana, Tanzania, South Africa; while Peru in South America; Thailand and Indonesia in Asia have also used this method in their land reform programmes.

### **4.1 Systematic Title Registration**

This is a system of registration whereby a specific geographical location is steadily worked through so that all adjacent parcels of land within the area are adjudicated upon and or surveyed, issued titles to, and registered. It is a system that is usually initiated by government or its appropriate agency. The registration is compulsory and individual land owners have little or no choice in the matter. The initiating country or agency is usually supported by one or more of the following international development partners such as World Bank, Food and Agriculture Organisation - UN (FAO), International Food Policy Research Institute (IFPRI) and Department for International Development, UK (DFID).

### **4.2 Systematic Land Titling Pilot Scheme**

The PTCLR is currently developing a systematic land titling and registration module in collaboration with FAO, World Bank, IFPRI and DFID, to be tested in two pilot states (Ondo and Kano) of the Federation before deploying it throughout the country. The pilot project will be conducted in five selected local government areas in each of the two selected states.

### **4.3 Workshops on Systematic Land Titling**

Two workshops had been organized by PTCLR on

- Workshop on Legitimizing Systematic Land Titling and Registration in Nigeria, held in November, 2012:
  - To address identified legal issues and other constraints that may arise in, or impede, the process of implementing the systematic land titling and registration in Nigeria within the context of the Land Use Act and to find acceptable solutions with a view to legitimizing the process and the outcome.
- Workshop on Draft Regulation on the Land Use Act, held in February 2013:
  - To deliberate upon, evaluate and validate the draft regulation thus far developed by the PTCLR in conjunction with and the immense support of Growth and Employment in States - Support for Improved Business Regulation (GEMS 3) of DFID. The draft regulations arose from the recommendation of the workshop on Legitimizing Systematic Land Titling and Registration in Nigeria.

The two workshops made invaluable recommendations on draft regulations that will ensure

the implementation of the SLTR within the ambit of appropriate laws and regulations, when passed by the National Council of States, the government organ empowered to do so by the Land Use Act.

## 5. GEOINFORMATION DIMENSION OF SYSTEMATIC LAND TITLING

One of the terms of reference (TOR) of the PTCLR, is very pivotal to the success of the remaining mandate of the Committee. This TOR is on systematic land titling and it states that "*the committee will ensure that Land Cadastral Boundaries and Title holdings are demarcated in such a way that community, hamlet, village, village areas, towns etc will be recognizable.*" The implication of this is that:

- The country will be mapped at relevant scales to provide large scale topographical database.
- All parcels of land will be properly surveyed and title deed plans will be prepared and issued to land owners (Systematic Land Titling).

Thus to achieve the goals of SLTR there is need for a reliable geoinformation and a developed cadastre. In addition, appropriate information communication technology (ICT), sound regulatory reform and good governance systems are also very essential. The success or otherwise of the land reform programme depends on the flow of information relating to land and property between different government agencies and between these agencies and the public.

### 5.1 Cadastral Infrastructure

The aim of the cadastral infrastructure in land reform is to define each parcel of land holding unambiguously in order to facilitate the issuance of a land title. The delineation for deeds preparation can be by two methods viz.: approximate boundaries marked on satellite or aerial orthophoto maps, by persons trained on ad-hoc basis to quickly prepare title documents for various land owners, which will be improved upon by appropriate field survey method; or systematic boundary demarcation by field survey methods followed by charting on a base map. The argument for the former is that it can be obtained faster and cheaper than surveying to cadastral standard. However while it may be initially cheaper and faster to obtain orthophoto maps and delineate land parcel boundaries on them, the approach is fraught with a lot of problems such as boundary identification both on the orthophoto map and on the ground especially in forest areas and areas of permanent cloud cover in the southern Nigeria. It is also more expensive to make improvements on such approximate method when a land data bank driven by GIS is to be created. While the orthophoto method was used in Rwanda, standard cadastral survey method was used in Botswana to develop a successful Tribal Land Information and Management Systems, (Atilola, 2011).

### 5.2 Status of Mapping in Nigeria

Nigeria is well endowed but poorly mapped. The basic topographical map for the country is the 1:50,000 series. These maps were produced some 40 to 45 years ago, and their revision had not followed the internationally recommended revision period of 10 and 15 years for

urban and rural areas respectively. The complete revision of these maps and conversion to digital database are currently being carried by the Office of the Surveyor General of the Federation. The status of large scale maps is appalling, only very few state capitals have current large scale maps for planning and development purposes. The production of large scale maps is very central to national development as geoinformation is the basic infrastructure for physical planning, land administration and sustainable development; it is the culture in developed nations of the world.

To underscore the culture of mapping in developed countries, the Ordnance Survey as far back as 1990s “created and maintains the National Topographical Database (NTD), which is now the master map of Britain. It features items as small as telephone boxes and private garages, and shows the detailed shapes of individual buildings. The NTD is effectively a seamless electronic map of the whole country which has replaced the need to maintain around 230,000 individual maps” (GIM, 1998).

### **5.3 Large Scale Mapping**

Large scale topographical maps are required in systematic land titling and registration for field identification, charting and registration purposes; where this is not available ortho-rectified imagery can be used. The land reform programme, the success of which depends largely on geospatial data, should be used as an opportunity to adequately map the country and to drive development in other sectors of the economy. Large scale mapping and creation of topographical database of the entire country, driven by GIS, will form the basis of surveying of land parcels in the country to cadastral survey standard without loss of time, using rapid survey method. The same data will then be used for the creation of National/State Land Information and Management Systems, (LIMS). To achieve this, it is recommended that a digital aerial camera should be purchased by the federal government and the entire country be flown by the Nigerian Air Force. This will be cost effective in the long run, as it can be used for future mapping projects and commercially deployed in West African countries. Ortho-rectified maps can quickly be produced and used to start off the land reform project while the large scale maps are produced later as replacement for the orthophoto maps. The spatial infrastructure needed for this is available. The geospatial data obtained will be shared by other sectors of the economy to prevent duplication and waste of resources.

### **5.4 Cadastral Survey**

The primary function of the cadastral survey is the definition of parcels that is, the spatial location of the land. There must be definition on ground as well as definition on the map. The definition on the ground will be in form of monuments or makers, or physical features (hedges, walls etc.); while the record of the parcels will contain a description of the land in written (verbal), numerical or graphical form depending on the boundary system used (Dale, 1976). The extant laws on cadastral surveys in Nigeria provide for the fixed boundary system and it is highly recommended that the national land cadastre should be executed in accordance with the existing survey laws and the requirement for registration of statutory right of occupancy, deploying relevant professionals and using best practices that will deliver within shortest period possible (NIS, 2009). This will ensure that the mistakes of the past, as

evidenced by the Land Use Act, are avoided and also correct the deficit in geoinformation requirement of the country (Atilola, 2010).

Although graphical approach, using general boundaries has been deployed in some countries, it is not appropriate for countries where boundaries are not marked with hedges, and where vegetation cover and foliages prevent visibility of boundary physical features on orthophoto maps. Nigeria falls under this category of countries except in urban areas where boundaries are marked with fences. Even where boundaries are marked with hedges, recent technological advancement has made the process of obtaining field data for fixed boundary very easy, economical and fast. The technology and survey infrastructure that can be deployed to rapidly carry out cadastral mapping employing best practices is currently available. Thirty five (35) Continuously Operating Reference Stations (CORS) are planned for the country by the federal government. Fifteen (15) are already installed at strategic locations in the country, while others are being implemented. Some states of the federation, such as Lagos, Ogun and Cross River States, are also installing CORS as part of the large scale mapping of their respective states. With this infrastructure in place, land parcel boundary data can be systematically collected by rapid survey methods using Global Navigation Satellite System (GNSS) receivers as rovers.

## **5.5 Boundary Markers (Monuments)**

For systematic land titling, boundary markers may not be a priority however, landowners sometimes prefer an easily placed and visible boundary markers to define their properties. If markers are placed, the distances between markers may or may not be measured as the distances will be derived from the GNSS coordinates. When a general boundary system is used especially in urban areas, it is not necessary to accurately determine the positions beacons of the boundaries; the physical features are the legal boundaries.

The boundary markers can be in form of angled irons or even concrete on hard grounds. The land owners can be educated on the type of marker to be used during the stakeholder meeting, and then emplaced after adjudication. Where adjudication and demarcation have taken place, the incidence of boundary disputes is invariably low. Thus, it is recommended that boundary beacons/markers should be emplaced as cheaply as possible after adjudication.

## **5.6 General or Fixed Boundary**

Fixed boundary system is one in which the precise line of the boundary has been determined; while a general boundary is one for which the precise boundary line can only be established by adjudication. The choice of the use of either boundary depends on tradition, availability of large scale maps and cost. With the advancement in space and digital technology and the availability of adequate geospatial infrastructure in the country, there is no reason to resort to general boundary system in the implementation of systematic titling and registration.

## **5.7 Field Data Capture**

Field data capture is usually carried out after adjudication. Adjudication is the process whereby ownership and limits of parcels of land are determined. Usually this is settled in the field, but can resort to the Courts if the parties cannot agree as to the limits of their land parcels. In systematic titling system, when a boundary dispute is in Court, the land parcel affected is surveyed but not registered.

It is very important to sensitise the land owners in a community to be surveyed. They should be informed well ahead of the time of survey, while a visit should be made to the community head before the appointed date to educate them on the benefit of the exercise. A stakeholders meeting should be held with the community during which land owners will be requested to mark the boundaries of their plot before the date fixed for the actual survey. Through this, most boundary disagreements must have been sorted out before the field survey.

There must be at least one person in the survey team who is familiar with the community and can speak the language. The data capture should be in two parts, viz.: textual data capture and spatial data capture.

### **5.7.1 Spatial Data Capture**

The spatial data collector must go to site with GNSS receiver and the current map of the area to be systematically surveyed for proper identification and delineation of land parcels. All plot owners and their neighbours must be present during the survey. All plot owners must have IDs and each plot must have unique numbers either on LGA or state basis. Where there is dispute the plot must be marked for a revisit after the dispute must have been settled by the community leaders. A video or picture of the area surveyed must be captured on a daily basis.

The most daunting task in the data capture is how to separate intricate web of various land holdings such as grants, pledges, tenants etc and who is to be issued title (Atilola, 2010). The chiefs/community leaders are expected to play the role of unbiased arbiters in this connection.

### **5.7.2 Textual Data Capture**

This can be treated as metadata on the spatial data captured. The textual data capture will deal with the personal data on individual plot owners. Such data to be filled in a questionnaire will include name, date of birth, gender, marital status, next of kin, etc. If the land has been previously surveyed, a copy of such survey will be collected and the title to the land, if any, will be noted. Family and stool lands must first be identified with all family members present and the family history recorded; and then individual plots within the family land can then be identified with corresponding name(s) against the plot(s). Plot owners who are not family members but tenants on the land or those who have purchased land from the family must also be recognised and extent of their interests noted and recorded. An identification number and card must be issued to each plot owner duly signed and dated by both the data collector and the plot owner (Atilola, 2011).

## 5.8 Quality Control

At the end of each field day, the spatial data collector must download the field data and the surveyor must plot the land parcels to ensure that there are no gross errors or gaps in the area covered. The data is then uploaded into the adopted FOA Software for Open Land Administration (SOLA) for processing, or simply computerized and sent to the local government headquarters or the state capital for further processing towards the issuance of land title (Atilola, 2011).

## 6. COST OF SYSTEMATIC SURVEY

In systematic land titling, systematic survey is usually viewed as slow and cost intensive, and therefore some other approximate methods, employing general boundary system, are wont to be used. However, advances in technology had changed all the factors that make systematic survey slow and expensive; and where the personnel and spatial infrastructure is available systematic survey which is far superior to general boundary system should be adopted. In our situation the cost of systematic survey will be reduced as a result of the following factors: number of plots, type of markers, method of survey and surveyors' readiness to partner with government.

**Number of plots involved:** When dealing with large number of contiguous plots, cost per plot is far less than if each plot had to be surveyed separately. For example dealing with more than 50 to 100 contiguous plots, using conventional methods, the cost per plot could be as low as 20% to 30% of the cost of surveying each plot separately sporadically depending on the vegetation type and accessibility.

**Type of markers (Simple Boundary Markers):** The boundary corners of land parcels need not be marked with standard survey beacons. Simple boundary markers that can be emplaced and protected by plot owners after adjudication will be sufficient and cost saving.

**Method of survey:** Cost of survey is further reduced by fit-for-purpose survey using GNSS rovers with CORS.

**Professional Concessions:** The land reform is a national project on which the land professionals must make substantial contribution by being pragmatic about their professional fees. The Nigerian land surveyors have identified with government on the land reform agenda and are ready to make professional sacrifices towards the realization of the goals of the reform.

## 7. CAPACITY AND CAPACITY DEVELOPMENT

Capacity is defined as “the ability to perform appropriate tasks effectively, efficiently and sustainably (UNDP, 1998).” It is the ability or capability of a person or a thing to perform or

produce optimally and efficiently. The success of the systematic land titling will to a large extent depend on capacity (human and technical) and overall strategy employed.

### **7.1 Current Survey Personnel Base**

The surveying community in Nigeria currently has at present a total population of about 56,000 persons out of which 2400 are full professionals (Registered Surveyors). The rest is made up of Pupil Surveyors (with prerequisite qualifications for full registration), Technologist, Technicians and Students. The personnel base is increasing at a rate of about 8% per annum based on over 30 polytechnics and universities. Some of these will need training in the operation of GNSS and CORS.

### **7.2 Capacity Building**

The available manpower base can be trained formally and informally for systematic survey for land titling using the use of GNSS and CORS rather than recruiting fresh hands without prerequisite survey background. The informal training will be at respective survey offices while the tertiary institution can organize short training courses that are practically oriented. Appropriate training should also be provided for management of acquired field data for proper entry and integration with the database.

### **7.3 Professional challenges**

Professional surveyors must adapt to changes in spatial data capture brought about by space and digital technologies; the cm accuracies of conventional surveys are not necessary for systematic land titling, the fit-for purpose rapid survey method using GNSS referenced to CORS for consistency and integration of each local government, state and the entire country into seamless databases is more than adequate. Surveyors must invest in digital equipment and participation in the systematic survey for the SLTR must to be driven by professionalism and must be ready for concessions on standard professional fees in order to ensure timely execution of the SLTR at minimum cost.

## **8. CONCLUDING REMARKS**

The land reform agenda of the Federal Government is presented and reviewed. The major objective of the land reform is to transform Nigeria into a land market economy by issuing land titles to all land owners especially the rural dwellers who cannot use their asset –land – to raise capital because they do not have titles.

The systematic land titling is the pivot of the land reform agenda and all other mandates of the Committee depend on it. For it is only when *the Land Cadastral Boundaries and Title holdings are demarcated in such a way that community, hamlet, village, village areas, towns etc are recognizable* that we can start to issue titles to land owners, plan, use and administer land in a sustainable manner, turn the country into a land market economy, and commence the eradication of poverty in the land. This is the dream of the Federal Government of Nigeria and

the PTCLR is saddled with the responsibility of actualizing the dream.

Large scale topographical maps are required in systematic land titling and registration for field identification, charting and registration purposes; where this is not available orthorectified imagery can be used. Nigeria is well endowed but poorly mapped, the land administration reform programme and other sectors of the economy will benefit immensely from large scale mapping and creation of topographical database, driven by GIS. It is therefore recommended that large scale topographical mapping of the entire country should be carried out to drive the land reform programme and other sectors of the economy.

In implementing the systematic land titling it is argued that the fixed boundary system should be adopted. In Nigeria boundaries are not generally marked by permanent hedges except in urban areas. Where they are so marked, maps showing the features are not available, and in southern part of the country vegetation cover prevent visibility of boundary physical features on orthophoto maps.

It is also suggested that the appropriate cadastral survey using GNSS rapid survey method, rather than graphical method will be most appropriate and will be in line with the existing cadastral protocol and regulation. The survey personnel and infrastructure for the rapid survey method are available.

The cost of implementing the systematic land titling and registration (SLTR) is of paramount importance. Cost of systematic survey is generally viewed as prohibitive. Advances in technology have changed all the factors that make systematic survey to be slow and expensive. When dealing with a large number of plots of land using conventional method the cost could be as low as 20% to 30% of cost of surveying individual plots sporadically, depending on the vegetation type. Other factors that will further reduce cost are: fit-for-purpose survey method, type of marker and concessions to government on professional fees.

Finally it is suggested that the Presidential Technical Committee on Land Reform should ensure that SLTR is carried out using best practices and involvement of relevant professionals. It is argued that the personnel and spatial infrastructure that will ensure the timely execution of the SLTR at minimum cost to government are available.

## REFERENCES

1. Atilola, O. 2011. Land Reform in Nigeria: Need for a Holistic Approach. Paper Presented at the annual General Meeting of the Nigerian Institution of Surveyors, Calabar, 13-17 June.
2. Atilola, O. 2010. Land Administration Reform in Nigerian: Issues and Prospects. Invited Paper, FIG Congress, Sydney, Australia, 11-16 April.
3. Atilola, O. 2010. Capacity Building: From Measurement to Management. Paper Presented at the annual General Meeting of the Nigerian Institution of Surveyors, Abuja, 24-28 May.
4. Dale, P.F. 1976. Cadastral Surveying within the Commonwealth, London, Her majesty Stationery office
5. Fajemirokun, F.A. and Atilola O (1979). The Surveyor's Role in the Successful Implementation of the Land Use Decree. *The Map maker*. Journal of the Nigerian Institution of Surveyor, Vol. 5 No. 2
6. Nigerian Institution of Surveyors (NIS) 2009. Memorandum on Land Reform, Submitted to the Presidential Technical Committee on Land Reform.
7. Williamson, Enemark, Wallace, Rajabifard, 2010. Land Administration for Sustainable Development. ESRI Press380 New York Street, Redlands, California.
8. Global Land Tool Network (GLTN). UN-HABITAT, No. 01 – 11. <http://www.gtltn.net>
9. Wikipedia, Free Encyclopaedia. [http://en.wikipedia/wiki/wiki\\_titling](http://en.wikipedia/wiki/wiki_titling)
10. Wikipedia, Free Encyclopaedia. [http://en.wikipedia/wiki/capacity\\_building](http://en.wikipedia/wiki/capacity_building)
11. GTZ, 2006. GTZ GmbH, Namibia. An Institutional Framework for Land Reform in Namibia. <http://www.gtz.de/dewelywelt/afrika/namibia/1396.htm>
12. Land.buisnessDictionary.com. <http://www.buisinessdictionary.com/definition/land.html>

## BIOGRAPHICAL NOTES

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