Geospatial information in good land policy and governance in Benin

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Key words
- Land Registry
- Cartography
- Data base
- GIS

Abstract
The decentralization stated in Benin 2003 with main goals ensure the rational use of land and its resources. In the vision to support this goal, I help some of the Benin cities place for setting and operating their Land Registry.

After the feasibility study which specifies the conditions to be considered in the implementation of the project, it is conducted taking satellite images then the realization of the digital receiver and cartography from topographic survey and existing plans. Then, large comprehensive survey is organized to collect information and plot by plot data base designed for this purpose.

The junction of the cartography and scanned the database allow the town to have a better knowledge of lands, immobilizer and urban help in eliminator decision tool for the planning and urban management. It is possible to make thematic maps follow urbanization and planning. The operations of calculation and collection of taxes are computerized local and promote a substantial increase in communal financial resources also making the switch from simple, at least three times and conferring capacity of local development funding important.

The Land Tenure set up allows to have a better knowledge of land assets whose common features. The city has the opportunity to have a reliable inventory of plots on its territory and thus to contribute to securing land transactions. In the database, the parcel file traces all identified parcels that are also found on the base mapping. A well marked parcel, clearly identified from its owner and integrated in the database can not be sold to several people at once or be the subject of fraudulent assignment. Better, the procedure of purchase of a plot that does not end with the
change of owners in the database is unreliable. This ensures security of private land but mainly contributes to the identification of the public domain of the State and Local Government, public use of land plots and mode.

By doing this, the Land Tenure is a database that allows the local administration have actionable information to municipal management. The implementation process is to gather land data, urban and tax from property assets. The tool allows the municipal authorities to easily dispose of such data on the population in a neighborhood or in the city, socio-community infrastructure or equipment, sanitation and other information, which both Mayor and Council communal to make decisions. For example, for the number of households with water, latrines or other, you just have to query the database. The operation and updating of the tool lead to the development of a Geographic Information System for the development of a map management tool localized urban data exploitable for needs of municipal management and aid to decision making. Meanwhile, social mobilization is necessary to pay employing the parties of the administration and the population. Agent training is also important for the prize in hand tool for exploitation, updating and achievement of objectives.

**Introduction**

Benin has known since the early 90's rapid development of all of its institutions. Benin has particularly engaged on the path of decentralization with the Constitution of December 11th, 1990. The reform related to decentralization entered its active phase in 2002 with the first communal elections and in 2003 with the installation Communal Councils headed by the Mayors. The seventy-seven (77) municipalities created by the Beninese legislators were launched. The first challenge of the Communal Councils to establish their bases and begin the gigantic work of development at the local level is the mobilization of resources. The challenge was not new but it reappeared with a vengeance with management autonomy and financial autonomy conferred on Local Communities. The municipalities must therefore define all strategies to enable them to mobilize resources to finance local development. Better, municipalities must have the planning and urban management tools for making fair and informed decisions in the context of local development. In this context, several Beninese cities have begun to set up a land, fiscal and urban management tool called LAND REGISTER. All experience allows us to understand the concept, its contours, its applications and its impact.
1. The Land Registry and his contours

1.1 Definition

The Land Registry is a municipal management tool which consists in a parcel addressed map of the city and a database for developing land applications, urban and tax. In other words, the Land Registry involves the establishment of a database from a better knowledge of land resources of the local authority. The Land Register is a register designed base form of computer data housed in a computer to be used through its various applications. The Land Registry database consists of a digital parcel mapping, a system for locating and identifying plots, activities, people and urban objects and Data on the equipment level of the plots on the built environment and the activities and the level of accessibility.

1.2 The applications of Land Registry

1.2.1 The land component

Land Registry has a first property function that is fundamental. With satellite images or aerial photographs supported by the base mapping that information is supplemented by land and urban surveys, Land Registry allows having a better knowledge of land assets whose common features. The city has the opportunity to have a reliable inventory of plots within its jurisdiction and thus be a way to contribute to the struggle for securing land transactions. In the Land Registry database, the parcel files traces all identified parcels that are also found on the base mapping. A well marked parcel, clearly identified from its owner and included in a database can not be sold to several people at once or in all cases subject to fraudulent transfers.

Better cooperation between the Department in charge of the Land Registry and the one in charge of Domaniale Affairs resulted in the purchase process of a plot that does not end with the change of owners in the database is not reliable. This ensures security of private land but mainly contributes to the identification of the public domain of the State and Local Government, public use parcels and land ownership.

For example, the plot numbered 102 – 1025 – C described as follows in the database is the Catholic Church in Dogbo.
This plot is found based on mapping at the place indicated above:

1.2.2 The tax component

Decentralization implementation in Benin aims to give municipalities the role of primary facilitator of local development. The municipalities cannot cope with their responsibilities if they
have the appropriate financial resources. A detailed analysis of their financial resources showed that they have very low yields and consist essentially of the only local tax revenues (property taxes, patents and licenses).

<table>
<thead>
<tr>
<th></th>
<th>Emission</th>
<th>Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Last year before</td>
<td>1st year after</td>
</tr>
<tr>
<td>Porto – Novo</td>
<td>€247 882</td>
<td>€161 596</td>
</tr>
<tr>
<td>(1994)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotonou</td>
<td>€2 349 239</td>
<td>€1 155 563</td>
</tr>
<tr>
<td>(1990)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parakou</td>
<td>€131 106</td>
<td>€36 588</td>
</tr>
<tr>
<td>(1989)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dogbo</td>
<td>€25 916</td>
<td>€12 196</td>
</tr>
<tr>
<td>(2006)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dassa</td>
<td>€16 373</td>
<td>€4 573</td>
</tr>
<tr>
<td>(1996)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The tax treatment of the land register has been assumed that the taxable tax matters in our towns is largely under exploited. This low yield is mainly due to lack of data, difficulties locating and identification of taxable property and the ignorance of land assets. Due to lack of staff and material and financial resources, the Revenue Service can not cover all areas and cannot appreciate and take into account any tax bases. The Land Registry provides a thorough and complete knowledge of developed and undeveloped properties, establishments and their owners. The information is included in a database that enables automatic calculation of taxes according to the formula recommended by the General Tax Code. This makes the calculated taxes are consistent with fiscal reality. Everyone is required to pay taxes and thus contribute to local development and no taxpayer nor any taxable item escapes the system. For tax purposes, the Land Registry introduced computerization of procedures of assessment and collection work and allows a broadening of the tax and therefore regard a substantial increase in potentially mobilized local tax resources. The table - after showing the evolution of the mobilization of tax resources in some communes of Benin which are equipped with Land Registry tool.
Clearly, through the tax component, the Land Registry allows the town to accompany Services Tax with the database that facilitates the optimum utilization, effective and efficient tax bases. This usually leads to an increase in tax resources mobilized to scale.

The danger at this level is that taxpayers and the general populations tend to equate the Land Registry to tax. In the implementation process of the Land Registry is the communication to help explain the different applications of the Land Registry to the people so they do not cling to the idea that the project has come out tax notices.

1.2.3 The urban component

Land Registry is an urban database that allows the municipality and its authorities with actionable information to municipal management. The implementation process is to gather land data, urban and tax from property assets. The tool allows local authorities to easily dispose of such data on the population in a district, socio-community infrastructure or equipment, water, hygiene, sanitation and other information that is used by the Mayor to make decisions. It allows editing thematic maps as needed. Land Registry improves decision making to meeting the real needs and not of partisan decisions. For example, to know the number of households with toilets, just to query the database. Above - below, each point corresponds to a toilet.

2. INSTALLATION STEPS UP THE LAND REGISTER

2.1 INSTALLATION Land Registry (LR)

2.1.1. The preliminary activities
The feasibility study

The town that wants to set up Land Register will commission a feasibility study. This study will reveal whether it is appropriate for the municipality to install the tool and possibly the conditions and characteristics that should be taken into account. With this information, the town, as Client through the Municipal Council and the Mayor, takes the decision, knowingly, to install the tool. Generally, the subject is placed on the agenda of a session of the Municipal Council making the decision in the form of deliberation.

The mobilization of funding

Once the decision is made, it is then subject to mobilize the necessary funding. The installation of LR has a relatively expensive cost, which varies according to the size of the city and the people and the area taken into account. This is what often explains the recourse to the city with support from a technical and or financial partner. This table shows the amounts invested here and there:

<table>
<thead>
<tr>
<th>City</th>
<th>Cost</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Djougou</td>
<td>128 057</td>
<td>City of Evreux (France)</td>
</tr>
<tr>
<td>Cotonou</td>
<td>1 394908</td>
<td>French Cooperation</td>
</tr>
<tr>
<td>Parakou</td>
<td>198 184</td>
<td>French Cooperation</td>
</tr>
<tr>
<td>Porto-Novo</td>
<td>457 347</td>
<td>AFD (France)</td>
</tr>
<tr>
<td>Dogbo</td>
<td>149 421</td>
<td>City of Ridderkerk and VNG (Netherlands)</td>
</tr>
<tr>
<td>Abomey</td>
<td></td>
<td>German Cooperation</td>
</tr>
</tbody>
</table>

The implementation of Land Register tool therefore involves a significant investment in the local community with the aim to improve its services for the populations. In this context, it is appropriate to bring the matter to public opinion explaining the contours of the tool and issues to facilitate understanding among people and build commitment and ownership of each and all for the tool.

2.1.2. The execution phases

The preparatory phase

- Creation of the Land Register Office
To begin the process, the municipality, the owner, is to begin to create a land register charge exclusively service run by a design framework to ensure coordination of the project. The town will have to provide that service spacious and suitable premises to house the service to be well equipped with furniture and office equipment, computers and vehicles.

- Social mobilization

There is a very important cross-member in the establishment of the RF project. This is the communication necessary to involve local councilors, municipal administration, the decentralized services of the State and all people in the process.

- The implementation phase

Two basic tools are essential for the establishment of a Land Registry: one addressed basic mapping and a computerized database. Defining technical choice is important in the implementation of those conditions LR basic tools.

These technical choices must clarify the following concerns the basic unit of information system: the needs of the local community defined in the Land Registry goals, institutional insertion tool: choice of an institutional framework to meet, consider and respect the versatility of the information system and streamlining procedures and processing of the database: choice of the mode of processing, storage and preservation of data and information.

In all municipalities of Benin with the Land Register, the plot was chosen as the base unit to meet the needs of local taxation based on property taxes, themselves based on property values or detectable activity of plot, property inventory and the location of urban data relating to the parcel, for their graphics processing and exploitation.

- Aerial photographs or satellite images

Then to get to the heart of the Land Registry, the implementation of the tool starts with taking satellite images or aerial photos by the providers of the sector.

- Surveying and / or plans for digitization

Then a surveyor firm selected to conduct the surveying of all parcels in the defined area. These surveys take into account or not parceled zones. If there is already plans (stocktaking, subdivision, resettlement), they are scanned. All documents must be delivered in the GIS
software format. The MAP INFO software is that used for the Land Registry in most communes of Benin.

- Establishment of the addressed basic mapping

From the surveying added to existing digital plans, base mapping is established on the basis of a parcel tracking system that allows them addressing. Addressing is the operation to locate a parcel, an urban object, activity or individual. The base of the RF is the plot, this is to locate and therefore to send the parcel.

Two addressing types are implemented namely addressing Q.I.P. or addressing R.E.P. The Q.I.P. address is from the geographical location of the plot using the administrative division or any division into homogeneous areas. The plot is identified from an area. The area can be considered when the entire town is not big enough or incorporated areas as was the case in Cotonou with one Cotonou 1, Cotonou 2 and following. Conventionally, every city has a code that allows to identify it:

<table>
<thead>
<tr>
<th>City</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dogbo</td>
<td>407</td>
</tr>
<tr>
<td>Cotonou</td>
<td>215</td>
</tr>
<tr>
<td>Parakou</td>
<td>45</td>
</tr>
<tr>
<td>Lokossa</td>
<td>412</td>
</tr>
</tbody>
</table>

The following identification of the plot element is the area (Q) to which it is given a number. Then there is the island (I) which is a set of plots delimited by streets, 3 or 4 in general. Finally, there are the plots (P) whose numbers are alpha and lowercase letters and numbers which moves in the opposite direction clockwise, starting with the most land in the southwest of the island.

So, if we have a QIP address 105 - 1090 - b, this implies that the number given to the district is 105, the number of the island is 1090 and the plot number, b. In the system set up, it is clear that 105 corresponds to a definite area.

The REP addressing is based on the numbering of streets and plots entries whose combination leads to the entrance of each plot. We could have as Example 17, rue145 or 3, Market Square.

Within two (2) cases, the addressing must be materialized by the paneling of the plots. Satellite imagery and base mapping will be juxtaposed so as to obtain reliable parcel plans that will facilitate the continuation of the process.
• Data collection

This is to collect land information, urban and tax and dispose of the information used in the construction of the database. It consists of conducting exhaustive investigations. This step is very important because it is the main source of information for the database to be set up. It requires careful preparation and proper organization in collaboration with the Plate Service from the city's tax office. This entry operation to automatically obtain the basic files.

Phase of development and consolidation

After data collection and the necessary clearance office survey sheets, ensues step of transmission to the Plate Service tax office where the Inspector of Taxes and colleagues also verified the information gathered. The involvement of agents of the Plate Service during field surveys is essential for their cooperation and facilitate their work at this level.

The capture operation is the integration of information collected and validated on investigation of records in different files of the software designed for this purpose are parcel file; buildings file, file of housing units, file of institutions and The taxpayer file.

Some database screenshots
All of these files is related and develops various Land Registry applications. Thus, the Land Registry database is available as the map database made with satellite images or aerial photographs and basic mapping and provision of the city.

- **The tax component**
Priority was given to improving the collection of tax resources. The files "Plots", "Buildings" and "Enterprise" put in relation to the file "taxpayer" help develop the tax industry, which is provided by the Directorate General of Taxes and Domains. The development of the tax industry involves the computerization of fiscal procedures and streamlining assessment and collection tasks. Thanks to computers, transcription manual tasks are replaced by control work on computer printouts different tax items and the tax calculation and development roles are automated. Also, the objective of this phase is to increase the efficiency of guard service by reducing the notice period of distribution to the benefit of better management of recovery.

- **The land component**
Land applications rely on the exploitation of the "plot file" which aims the establishment of a coherent land management policy by identification of public use parcels (socio-community...
facilities and others), land ownership mode (land titles, housing permits, ...), the parcel of taxpayer and traceability of land transactions in which the plot was the subject

- The urban component

The development of this sector consists of the development of a map management tool localized urban data usable for the needs of municipal management. The crossing of data mapping and database enables publishing of thematic maps according to the needs of different actors of local development, the establishment of an urban management policy and support for decision making.

The transmission phase

This phase is the ultimate level where the supplier responsible for the conduct of the Land Registry set-up will transmit the proceeds realized on the town that should take over the management, use and exploitation. For this, special emphasis should be placed on staff training available to the Land Registry load service. Training is so important for such personnel are able to learn, manage and update mapping and database after the implementation. Training should focus on the use of software entering into account in the database, on local taxation, the development and management of a Geographic Information System (GIS), the management and project management and others.

CONCLUSION

The establishment of the Land Registry and its optimal use requires a clear political will of the Municipal Council and especially the Mayor in his capacity as Client. As part of the sustainability of the tool and its development, it is necessary to strengthen the staff response capabilities in charge of its development work through specific training in computers, local taxation, mapping management, GIS and the various procedures. In addition, special emphasis should be placed on communication within the municipal administration on all activities related to the establishment and development of the database.

REFERENCES

BIOGRAPHICAL NOTES
After working five years ago from 2006 to 2011 at Municipality of Dogbo (Benin) where he was Chief of Land Registry Office then Local Development Director, Mr Xavier ZOLA assists Municipalities of Savalou, Comè, Ouidah and Misséré (Benin) to set up or improve their land tenure. Since 2015, he became Associate Manager of BENIN EXPERTISES & SERVICES Sarl which is an office that made technical assistance, training and studies in land management, mapping, GIS, decentralization and local governance and other. Mr Xavier ZOLA is Expert in Decentralisation, Local Governance, Land Management and GIS. He’s Secretary of Land Registry Network of Benin. He’s also Trainer at Local Administration Training Center of Benin. Mr Xavier ZOLA is passionate about the media. He’s the developer of newspaper SUD OUEST à Lokossa (Benin). He’s also very active in the cause of children, women and youth with Foundation ZOLA of which he’s Président.

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