GASTON BERGER UNIVERSITY

LEÏDI LABORATORY
"Territorial Dynamics and Development

REPORT OF THE RESEARCH COMMITTEE FOR
THE REALIZATION OF AN INVENTORY OF
DATA AND TOOLS IN THE CADASTRAL
SECTOR IN SENEGAL

Presented by Mouhamadou Mawloud DIAKHATÉ
Full Professor of Universities
Laboratory Director

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ACRONYMS AND ABBREVIATIONS

ANDS: National Agency of Statistics and Demography

ArcGIS: Suite of geographic information software developed by Esri

ADB: African Development Bank

BAGDOC: Office of General Affairs and Documentation

BD TOPO: Topographic data bank

BLC: Office of Legislation and Litigation

PRB: Public Relations Office

CAGF: Framework for analysis of land governance

CGE: Center for Large Enterprises

CSF: Centre des Services Fiscaux

CAD: Computer Aided Drafting

ICD: Internal Control Department

CAO: Deputy Director General

DGID: General Directorate of Taxes and Domains

DLEC: Division of Legislation, Studies and Litigation

DTAI: Direction du Traitement automatique de l'Information (Directorate of Automatic Information Processing)

2D: 2 Dimensions x and y

3D: 3 Dimensions x, y and z

IMF: International Monetary Fund
IPAR : Initiative Prospective Agricole et Rurale (Agricultural and Rural Prospective Initiative)

MEF: Ministry of Economy and Finance

DTM : Digital Terrain Model

NICAD: Cadastral Identification Number

SDO: Sustainable Development Objectives

ORDOC: Office of Order, Documentation and Management

PAMOCA: Support Project for the Modernization of the Cadastre

PNBG: National Program for Good Governance

PSE : Plan Sénégal Émergent

TFP: Technical and Financial Partners

SEVESO: Italian commune that was victim of pollution by a cloud of herbicide from a chemical plant

GIS: Geographic Information System

SIGTAS: Integrated Tax Management System

VAT: Value Added Tax
INTRODUCTION

Since antiquity, the graphic representation of land properties has made it possible to meet private needs for knowledge of the spatial extension of plots, as well as public objectives of land resource control. The cadastre reached its apogee during the Roman Empire, as an instrument for systematizing the division of urban land. With the fall of Rome, the cadastre would disappear for several centuries and finally reappear around the beginning of the 17th century. This rebirth of the cadastre would mark an important turning point in the history of land administration. It would henceforth be used as an instrument at the service of the State, allowing it to consolidate its power within its borders, notably through the taxation of private land wealth.

The cadastre is today defined as a public register of land ownership, which illustrates the fragmentation of a territory, registers each parcel separately, identifies the owner and assigns a value to it. Several countries have developed cadastres to support the state functions of land taxation and protection of private property rights. However, in the last twenty years or so, the concept of cadastre has been the subject of renewed interest, due in particular to technological progress and the emergence of new societal concerns about land use planning, urbanism, the environment and sustainable development. Cadastre is also the subject of work in areas as varied as poverty reduction, economic development, natural disaster management, post-conflict reconstruction and refugee resettlement. This conceptual modernization marks the transition from the cartographic tool of the cadastre to a concept of organization and structuring of land information, i.e. a cadastral information system.

In a context where many predicted the arrival of an "information society", it seems that the objective of these reflections and intellectual work was to increase the usefulness of the cadastre and to make its information content available to as many users as possible. This observation is very much in line with K.'s proposal for a multi-use cadastre. Dueker and D. Kjerne (1989). The latter sought to broaden the range of potential applications of the cadastre, beyond real estate taxation and the registration of land rights. Thus, the cadastre of the future should be a useful tool for new categories of users, such as planning and environmental specialists, administrators of public programs, policy makers, and citizens, to
base their decisions, opinions, actions, and interventions on a detailed and comprehensive knowledge of the land (Bennett et al., 2008; Dale, 2006; FIG, 1995).

This desire to break down the barriers to the usefulness of the cadastre has had a significant impact on international organizations such as the International Federation of Surveyors (FIG). Important work has been undertaken under its aegis. The Declaration on Cadastre is a major contribution to its conceptual modernization. It proposes a comprehensive definition, which takes up the traditional characteristics of a cadastre (parcelling plan, geometric description of parcels) and its historical functions (real estate taxation and security of land titles), to which are added new purposes: public land management, development planning, environmental protection, and the implementation of sustainable development (FIG, 1995). The concept of cadastre is enriched with the help of geographic information systems theory.

In Senegal, the establishment of a land registry service dates back to Decree 65-169 of 17 March 1965 on the organization of the Ministry of Finance and Economic Affairs, which in Article 9 provides for "land organization, including registration, conservation of land rights, land development and land registry operations" among the responsibilities of the Directorate of Taxes and Domains. The Minister of Finance, under the terms of Order No. 2580 of February 23, 1966, issued for the implementation of the aforementioned decree, created within the Directorate of Taxes and Domains, the Land Registry Service. In 1978, the Land Registry Department was created to be attached to the Ministry in charge of urban planning and then returned to the DGID in 1980. Its main missions are four in number:

1. A technical mission which consists in the preparation and maintenance of the plan;
2. A legal mission in charge of the demarcation in the chain of delivery of property titles and related real rights;
3. A fiscal mission relating to the determination of the rental value, the tax base of the built and non-built properties;
4. An administrative mission that can be summed up in its primary role in land governance (allocation, regularization, valuation reports, issuance of documents, etc.).

For several decades now, Senegal's cadastral system has been undergoing gradual conceptual modernization and, with the reforms that have gradually been carried out, is becoming a supporting document for public policies, particularly in terms of strengthening the prerogatives of stakeholders, the administrative process of making parcel identification and recognition references consistent (Nicad), mastery of data acquisition techniques (Drone) and the development of digitized information databases. Indeed, as in many countries, cadastral information will henceforth be used in Senegal for purposes as diverse
as land use planning and territorial prospective, land use control, natural risk prevention and sustainable development. Thus, the cadastre is currently being modernized to improve the system for protecting land rights, while promoting its versatile use and the creation of value-added applications. Despite certain difficulties inherent in the implementation of a cadastral project of this magnitude, including the constraints of the 1964 Law on the National Domain, progress is expected to be made through the strengthening of land administration mechanisms, land tenure methods and the securing of real estate rights in a context of in-depth decentralization and the effective exercise of powers transferred from the State to local authorities.

It must be said that the conclusions of the research committee were based on a very broad documentary base constituted by:

- institutional productions (reports of workshops, seminars, symposiums organized by the ministries and agencies concerned) and productions that accompany the programs of the technical and financial partners (TFPs). The free expression of opinion by various actors (civil society, whistleblowers, lobbyists, etc.) is considered grey literature but remains an indicator of social facts, especially in the context of the "land grabbing" that urban and rural land tenure is currently experiencing;
- the report on the Land Governance Analysis Framework (CAGF, Ipar - 2013). Considered as a diagnostic tool that made it possible to assess the status of land governance in Senegal, the CAGF systematically drew on local know-how and existing data. Indeed, the CAGF provides a synoptic view of certain themes that have until now been dealt with separately. The process has made it possible to build consensus on key aspects of land governance and to define priority actions concerning:
  
  (i) missing data that are nevertheless relevant to improving land governance;
  (ii) areas for regulatory or institutional reform, and interventions to improve land governance on a larger scale (e.g., strengthening land rights and improving their enforcement);
  (iii) the criteria for evaluating the effectiveness of these measures. The CAGF is also helping to put in place a process to monitor, in a long-term and systematic manner, the progress made in improving land governance;

- the provisions of the order of the Ministry of Economy and Finance (MEF) n°20287 MEF/DGID dated December 31, 2013 on the organization of the General Directorate of Taxes and Domains;
- the recommendations drawn from the three webinars held from 28 to 31 August 2020, which provided an opportunity for national and sub-national actors from Guinea, Mali and Togo to share good practices in land tenure and cadastral
management and governance for inclusive and integral territorial development in line with the Sustainable Development Goals.

I/ HISTORY OF THE EVOLUTION OF THE ORGANIZATION OF STATE STRUCTURES

From Pinet Laprade's note of 1867 on property tax in Senegal to the periodic report of 1883 on the operation of the Direct Taxation Services as well as texts on the tax regime in French West Africa (AOF), archival sources provide information on the founding files of a tradition of organization, administration and regulation of an essential economic function for the Colony, and later for the State of Senegal.

At independence, in the context of consolidating its achievements and recasting the objectives and modes of action related to the challenges of the time, the Government of Senegal drew heavily on this legacy to establish a fiscal, land and state administration in line with its new needs and orientations.

Thus, the General Directorate of Taxes and Domains (DGID), organized according to Order No.00591 MEF/DGID of February 2, 2009, modified by Orders No.00792 MEF/DGID of February 1, 2010 and No.014693 MEF/DGID of December 23, 2011, is strongly dependent on the structures inherited from the colonization. Indeed, the organization of the DGID is the result of a series of more or less profound changes in the former financial authorities whose evolution, over the years, is marked by different periods thus divided for the circumstance:

I.1 From the colonial period to 1963

This phase is especially marked by the coexistence of two clearly separate financial authorities:

- the Service, then the Miscellaneous Contributions Branch;

- the Service, then the Registration, Domain and Stamp Department.

According to the Decree No.59-193 MF of August 4, 1959, the Miscellaneous Contributions Service of Senegal includes:

- a Direction;

- a Delegation for the River Region;

- Divisional or functional inspections;
- a Research and Verification Brigade.

Under the authority of the Director, the Miscellaneous Contributions Department ensures the establishment of direct or indirect taxes due by taxpayers and the investigation of related litigation.

As for the Service of Registration, Domains and Stamps, which includes offices in charge of state affairs in the territorial districts, it is essentially constituted, according to the terms of Decree No. 59-192/DEDT of August 4, 1959:

- of a Directorate in Dakar;

- Recipe Offices in Dakar, Saint-Louis, Kaolack and Ziguinchor;

- of a Control in Dakar.

At that time, there was virtually no functional link between the two financial authorities. Moreover, they were housed in separate premises, each of the structures huddled up on itself and jealous of its prerogatives. And, within the Ministry in charge of finance, there was still no mention of the Cadastre; in fact, the Topographical Service, the distant ancestor of the Cadastre Service, depended on the Ministry of Public Works.

However, in that year 1959, a very limited attempt at a functional link for the purposes of tax audit is noted in the exchange of taxpayer information.

I.2 From 1963 to 1973

This chronological and institutional slice is characterized by multiple attempts to merge the structures of the financial authorities.

In 1963, is created a single department, the Directorate of Taxes and Domains (DID) comprising the former Departments of Miscellaneous Contributions and the Directorate of Registration, Domains and Stamps, according to Decree No. 63-795 of December 9, 1963 on the distribution of national services between the Presidency of the Republic and the ministries.

The Land Registry Service is concerned with baptismal funds in 1965, by Decree No 65-169 of 17 March 1965 on the organization of the Ministry of Finance, in its article 9.
The Department of Taxes and Estates, organized by Order No. 2580 of February 23, 1966, comprises Central Services and External Services.

The central services of the DID at that time were:

- the Legislation and Litigation Division;
- the General Administration Division;
- the Roles and Statistics Division;
- the Domain Service;
- the Land Registry Service.

The External Services consist of:

- Divisional Inspectorates of Direct Contributions;
- Registry, Domain and Land Registry Offices;
- the Office and the Indirect Tax Revenue;
- the Verification Brigade;
- the Divisional Inspections of the Cadastre.

In practice, this superimposition of the structures of the former régies did not give the expected results; therefore, it was necessary to think about a neo-organization more adapted to the social and economic context of the country.

I.3 From 1973 to 1980

The imagined structuring was put in place in 1973, following Decree N°73-808 of August 28, 1973 on the organization of the Ministry of Finance and Economic Affairs (MFAE), with the creation, for the first time, of a General Directorate of Taxes and Domains (DGID).

This period is mainly one of further integration of organizational structures, with a view to their rehabilitation, but also of better interweaving of tax services.
Placed under the authority of a Director General, the Tax Administration of 1973, whose structures with national competences include Central Services and External Services organized by tax or by nature of duty/taxes and taxes, is as follows:

**Related Services**

- the Legislation and Litigation Department;
- the General Administration and Equipment Department;
- the Verification Brigade;
- Service Inspection.

**Field Services**

- the Tax Department (DI);
- the Domain Directorate (D);
- the Land Registry Service (SC).

According to Decree No. 79-417 of May 12, 1979 on the organization of the Ministry of Urban Planning, Housing and Environment, the year 1979 marks:

- the partition of the Directorate of Domains and the Cadastre Service of the General Directorate of Taxes and Domains;

This experiment ended in 1980. It gave way to a new attempt at organization.

**I.4. From 1980 to 1991**

The brigades are competent to verify, throughout the national territory, all taxes and duties falling under the prerogatives of the DGID. In 1983, still with the aim of doing better, the Order N°11609/ MEF/DGID of September 3, 1983 on the organization of the General Directorate of Taxes and Domains repealed and replaced N°14461/ MEF/DGID of November 21, 1980.
The following new features are introduced:

- an effective merger of the missions of supervision and internal control of services with the creation of a well restructured Services Inspectorate; missions of tax audits and investigations entrusted to the DVEF; litigation and the development of administrative doctrine;

- a greater willingness to integrate services through periodic coordination meetings.

In 1985, as part of the measures to improve the tax base, control, and collection, the International Monetary Fund (IMF), in an aide-memoire dated July 25, 1985, called for an overhaul of the DGID's structures.

This reorganization was also essential in view of the implementation of the medium- and long-term structural adjustment plan and the tax reform enshrined in Law No. 87-10 of February 21, 1987 on the General Tax Code.

Among the accompanying measures necessary to fully master this reform, the reorganization of the tax department structures and the improvement and modernization of working methods occupy a prominent place.

This desire to adapt the structures and working methods of the Tax, Land and State Administration to the socio-economic realities of the country resulted in the need to issue Order N°013426/ MEF/DGID of November 30, 1990 on the organization of the General Directorate of Taxes and Domains.

In application, this text did not fit well with the needs of taxpayers. Neither did it allow for the optimization of the agents' action to reach the peak of efficiency; it was thus necessary to postpone its execution and try something else.

I.5. From 1991 to 1996

The General Directorate of Taxes and Domains has a different organization, which is enshrined in Order N°8169/MEFP/DGID of September 26, 1991, which repeals and replaces Order N°013426/ MEF/DGID of November 30, 1990.

The 1991 vision meets the following objectives:

- Reaffirm and strengthen the authority of the hierarchy (General Manager, Directors and Heads of Tax Service Centers) by relieving it of repetitive tasks and execution work to strengthen its command, coordination, design and animation missions;
- Achieve a balanced and progressive merging of services to eliminate their compartmentalization for a better flow of information;

- to set up a more complete and better structured organization of the Tax, Land and State Administration in order to increase its efficiency through the creation of:

  - a position of Coordinator;
  - a pool of Technical Advisors;
  - a Division of Legislation, Studies and Litigation (DLEC) comprising a Public Relations Office (BRP) and a General Affairs and Documentation Office (BAGDOC);

  - Establish a better definition of tasks, a judicious distribution of the workload integrating a doctrine of employment and a career plan for agents;

  - centralize and follow up all tax files within an Office of Order, Documentation and Management (ORDOC);

  - Organize work in a more rational way by making extensive use of IT tools;

  - to carry out at the level of the basic services a fusion of the tasks of assessment and control of all taxes and duties pertaining to the former structures by the creation of Merged Assets and Control Inspections (IFAC). This merger should allow the creation of a single file for each taxpayer;

  - grouping all the external services of the national directorates into homogeneous units through the creation of Tax Service Centers (CSF);

  - improve the brand image of the Tax and State Administration among public service users by placing greater emphasis on information, the basis of reference and the welcome given to citizens.

In order to achieve these objectives, the changes made affect both the central services of the DGID and the external services of the Tax Department, the Registration, Domains and Stamp Department and the Land Registry Department.

**1.6. From 1996 to 2000**

The year 1996 coincided with the first attempt to restructure the Tax and State Administration on a functional basis.

The major innovation brought by the Order No9159 MEFP/DGID of December 19, 1996 is:
- the creation of a Tax Services Directorate (DSF) regrouping all tax functions, including all revenues, registered as indirect taxes;

- the erection of a Directorate of Land and Cadastral Affairs (DAFC) which unifies the two former major directorates of the Directorate of Registration, Domains and Stamps and the Directorate of Cadastre.

This reform is causing strong internal resistance. As the authority was not decisive enough to actually implement it, it was finally suspended by the Minister in charge of the Budget.

Thus, during the period from 1996 to 2000, the General Directorate of Taxes and Domains was organized by Order No. 9159 MEFP/ DGID of December 19, 1996 with fairly ambitious objectives; but this text was never applied. From then on, the Tax, Land and State Administration continued to be governed by Order No. 8169/MEFP/DGID of September 26, 1991. This practice proved to be increasingly inconsistent.

It is in this context of confusion that, starting in the 2000s, the outlines of other reform projects gradually took shape, tending to establish more logical links and harmony between services.

I.7. From 2000 to 2011

In 2000, a number of structural reforms were prepared and implemented in response to the operational difficulties encountered by the tax, land and state administration, and also in application of the recommendations resulting from consultations with development partners.

These recommendations concern:

- the restructuring of Central Services on a functional basis, irrespective of the nature of the taxes, and on a balanced distribution of major assignments among the departments;

- the creation of the Centre des Grandes Entreprises (CGE).

Order N°009843/MEF/DGID of October 27, 2000 on the organization of the General Directorate of Taxes and Domains sets up the CGE. The Decision N°00162 MEF/DGID of January 11, 2001 determines its organization and operation; the Memorandum N°0326 DGID/DLEC of March 30, 2001 determines its areas of competence.

After the functional formula tried in 1996 but never applied, the Order N°009843/MEF/DGID of October 27, 2000 returns, almost, to the old organization of 1991
which only retains the technical departments of the past which are the Directorate of Taxes, the Directorate of Land Registry and the Directorate of Tax Audits and Investigations.

In addition to the creation of the CGE, the main new features of the Order N°009843/MEF/DGID of October 27, 2000 are:

- the desire to strengthen the position of Coordinator, who appears as a kind of Deputy Director General (DGA) responsible for the coordination of all DGID services. He ranks after the Director General and replaces him in case of absence;

- the abolition of the General Inspectorate of Services (IGS) and its attachment to the General Inspectorate of Finance (IGF) of the Ministry of the Economy and Finance.

Apart from these three major innovations (creation of the EMC; reinforcement of the position of Coordinator; abolition of the GHI), the other proposals, especially the reorganization of services on a functional basis, seem to have been postponed. The reasons generally cited to justify this caution revolve around the many projects that have been started simultaneously.


- the deletion of the "division" step;

- the creation of "sections" with specialized attributions; - the multiplication of positions of responsibility.

The 2004 structural reform, pursuant to Order No. 007619/MEF/DGID of September 15, 2004, largely concerns the establishment of an Internal Control Department (DCI).

According to Order N°005330 MEF/AD/bt of June 15, 2004 relating to the Internal Control Departments of the General Directorates of the Ministry of Economy and Finance, the DCI is notably responsible for:

- to ensure, under the authority of the Director General, the application of the directives resulting from the reports of the Inspectorate General of Finance and those of other control bodies;

- ensure the application of presidential or primatorial instructions and directives;
- to assist the Director General in controlling the management of staff, equipment and credits of all the services under his responsibility;

- carry out any investigation, verification and control mission entrusted to it by the Director General to whom it reports.

Order N°000955 MEF/DGID of February 19, 2007 repeals and replaces Order N°007619/MEF/DGID of September 15, 2004. As it results from this text, the structuring of the General Directorate of Taxes and Domains enshrines the division of the main centers in the Dakar Region into several others, followed by the creation of Tax Service Centers in the Medina, Dakar-Liberté and Ngor-Almadies.

In December 2005, under the impetus of the political will of the Government of Senegal and the support of its main partners, both multilateral and bilateral donors, the Tax, Land and State Administration embarked on a vast project to modernize the business functions resulting from its remit. The project leads to the implementation of projects including:

- the project for the implementation and implementation of an Integrated Tax Management System (SIGTAS);

- the project of dematerialization and digitization of land, state and cadastral information;

With this modernization in mind, the search for a state-of-the-art organizational structure capable of handling the innovations that would result from this important program was necessary.

In addition, the service structuring model implemented in 2007 not only did not meet the requirements of the modern management context of a tax administration, but rather presented dysfunctions at the operational level.

In the interest of greater efficiency, Decree No. 2008-642 of June 16, 2008 on the organization of the Ministry of Economy and Finance, amended by Decree No. 2008-1226 of October 30, 2008, led the department to make technical adjustments within the General Directorate of Taxes and Domains.

Thus, on the proposal of the Director General, the year 2009 saw the birth of an organization of the structures prescribed by Order N°00591 MEF/DGID of February 2, 2009, modified by Order N°00792 MEF/ DGID of February 1, 2010.

The changes are as follows:
- the erection of the Office of Legislation and Litigation (OLL) direction. It becomes the Department of Legislation, Studies and Research.

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The changes are as follows:

- the erection of the Office of Legislation and Litigation (LLC) in direction. It becomes the Directorate of Legislation, Studies and Litigation (DLEC). The structure includes a Research Office in charge of analyzing the fiscal, budgetary, state and cadastral impact of public policies;

- the elevation of the Office of Administration, Budget and Equipment (BABE) in the direction of the Office of Administration and Personnel (DAP);
- the creation of the Direction du Recouvrement (DR).

The establishment of a directorate in charge of tax collection within the Directorate General of Taxes and Domains is justified by the Senegalese government’s option to gradually transfer, starting January 1, 2009, the responsibility for collecting direct state taxes from the Directorate General of Public Accounting and the Treasury to the DGID, with the aim of facilitating the fight against tax fraud and increasing public revenue.

In addition, this 2009 restructuring offers the opportunity to carry out major technical changes to improve the coordination of existing services.

The reform enshrined in Order No. 014693 MEF/DGID of December 23, 2011 is the result of two factors:

- the need to improve the organization of certain services, which is learned from practice;
- the control of the evolutions that can allow Senegal to have a tax administration close to the international standards.

Overall, the 2011 structural reform is based on three objectives:

**A/ Optimal mobilization of tax revenues:**

This is done by:

- the creation of a Center for Medium-sized Enterprises (CME). It represents the second essential link in the strategy of segmentation of the base, after the creation of the Center for Large Enterprises in October 2000. The CME will manage companies whose turnover is between 200,000,000 and 1,000,000,000 FCFA, excluding regulated professions (formerly called "liberal professions") which are subject to the supervision of a professional order composed of notaries, lawyers, doctors, pharmacists, architects;

- the monitoring of regulated professions by a specialized service, the Centre des Services fiscaux des Professions réglementées, through the refocusing of its portfolio from which all taxpayers who do not belong to professional orders will be removed;

- measures to reorganize the general tax service centers, in the extension of the creation of the CME; thus, at the territorial level, the Tax Service Centers of Dakar-Plateau I, Dakar-Plateau II and Medina are merged into a single center in Dakar-Plateau; at the functional level, the 2002 separation between the Professional Taxation Office and the Personal Taxation Office is abolished. Extensive consultations with the social partners and lessons
learned from experience have shown that the separation has greatly undermined the policy of broadening the tax base. Therefore, a single Tax Office was created;

- the reorganization of the sections of the collection office housed in each LSF (generalist or specialized), with the aim of making it more efficient;

- Harmonization of the eligibility threshold for the CGE; a single threshold of FCFA 1,000,000,000 has now been established, whether for service providers or companies in the commercial or industrial sectors;

- the transfer to the CGE of all State agencies and assimilated public structures in order to ensure a better follow-up of the VAT withholding tax.

B/ Rationalization of structures

In a methodical manner, the DGID has made some timely adjustments: in particular, with

- The Office of Strategy and Monitoring (OSM) becomes the Office of Strategy and Modernization (OSM). Its competence in the area of strategy remains. The BSM continues to be responsible for developing strategies and reforms for the DGID, particularly through the Administration's Strategic Development Plan (PDSAF) and the Performance Contract with the MEF. The "modernization" component concerns the management or monitoring of DGID modernization projects, with the aim of ensuring their overall consistency.

- As a result of the creation of the WSO, the Office of Information Technology and Service Modernization (BIMS) loses the competence related to "service modernization". It focuses exclusively on IT management, a sign of the strategic importance of ICTS for the DGID.

- Another result of the change from BSS to BSM is the creation of a Monitoring and Synthesis Unit (CSS), as the BSM no longer manages the "monitoring" aspect, except in the specific case of modernization projects for which it does not directly manage.

Reporting to the Director General and at the disposal of the Coordinator, the role of the CSS is to support them in monitoring the application of directives received by the directorates, the attached services, the chargé de missions and the technical advisers.

In addition, the CSS monitors the revenue situation on behalf of the Director General. As regards the "synthesis" component, it covers two activities:
- a periodic report, consisting of the centralization of activity reports from the directorates, attached services, mission leaders, technical advisors and the production of DGID management reports;

- the other permanent, consisting of the support provided to the Director General and the Coordinator in maintaining the coherence and interoperability of the day-to-day actions of the DGID structures;

As part of the strategy to deconcentrate the operational skills of the General Management, the Office of Archives and Documentation (BADOC), hitherto a department reporting to the Director General, is being repositioned within the Directorate of Administration and Personnel (DAP). The Office of Judicial and Extrajudicial Acts and Transfers by Death (BAJEM) is abolished. The DGID’s strategy is to divest itself of exceptional bodies in all cases where their existence does not result in productivity gains significantly greater than those of ordinary law structures.

The registration of judicial acts whose diligent nature is crucial to the proper functioning of the public justice service will not be affected by the disappearance of the BAJEM; it is entrusted to the collection offices within whose geographical jurisdiction a departmental or regional court is located, with the creation in each of these offices of a section dedicated to this task.

As for extra-judicial documents, those of auxiliary professions such as bailiffs, the DGID has opted for deconcentration; from now on, bailiffs will be able to register their documents at the collection office closest to their professional address.

Finally, the BAJEM’s competence on the guardianship of vacant and unmanaged real estate is transferred to the Land Conservancy, which will allow for gains in simplicity, speed of procedures and transparency in management.

C/ Better service to the user

The DGID has adopted an approach of deconcentration of its services most requested by citizens. Thus:

- two new land conservations are created: one competent on the Department of Guédiawaye and the other on the Municipalities of the District of the Sanitized Plots, Grand-Yoff, Patte d’Oie and Cambérène;

- the Vehicle Duties and Taxes Office (VDOT) is abolished. In addition to the general logic underlying the DGID’s approach, which consisted in reducing exceptional structures in favor
of ordinary law bodies, it had become anachronistic for citizens residing in the Dakar Region to be able to pay their "vignette automobile" or register a vehicle transfer in only one department.

The abolition of the BDTV is therefore mainly aimed at satisfying the objective of bringing the Administration closer to the users. From now on, provided that the vehicle is registered in the Dakar Region, the said fees and taxes can be paid in five sites which are:

- the city center by the Dakar-Plateau Collection Office; - the Bourguiba Avenue site by the Grand-Dakar Collection Office;

- the CICES site by the Ngor-Almadies Debt Collection Office;

- the site of Guédiawaye by the Pikine Collection Office ;

- the Rufisque site by the Rufisque Collection Office.

In the light of these successive developments, it can be seen that the reforms of the structures of the tax, land and state administration have always aimed at one main objective divided into two strategic options:

- the consolidation of a leading-edge service organization with a focus on efficient revenue mobilization (spontaneous collection);

- an ever more efficient and user-friendly range of services for users, focusing on the following aspects: reception and welcome, external communication, simplification of procedures, single point of contact. The prospect is to achieve voluntary tax acceptance and a business-friendly environment.

More specifically, depending on the country's social and economic context, it is a matter of achieving an optimal organization that firmly integrates homogeneous and operational structures for the management, from the bottom up, of the processes that are part of the DGID's main missions, which are, among others:

- the base and the liquidation;
- recovery;
- tax audit;
- legislation and litigation;
- integrated management of land information, all of which revolves around:
- a new results-based resource management (RBM) philosophy that makes greater use of internal communication, professional training, knowledge enhancement, accountability, management dialogue, systematic monitoring of activities, evaluation and management reporting on progress.

I.8. Since 2013

The consolidation of the DGID’s achievements has been set by an order n°20287 MEF/DGID on the organization of the DGID, which places under the authority of the Director General of Taxes and Domains the competences for all matters concerning:

- direct taxes and assimilated taxes;
- indirect taxes and assimilated taxes other than those payable on importation and exportation;
- registration fees, stamp duty, land registration fees and similar taxes;
- the domain of the State;
- the land organization;
- the cadastre; property that is vacant and without a master or placed under sequestration as a result of a general security measure.

Within the framework of this competence, the General Directorate of Taxes and Domains is in charge of:

- the preparation of legislative and regulatory texts and international conventions of a fiscal nature or with fiscal implications;
- the assessment, liquidation, collection and litigation of taxes and taxes assimilated to them within the limits of its competence;
- tax information, the search for omissions, concealments, inadequacies and generally tax offences;
- the constitution, management and disposal of the State's private real estate domain within the limits of its competences;
- the disposal of the furniture sector;
- of the management of the public domain within the limits of its competences;
- of the recovery of the products of the;
- training and staff development in connection with vocational training schools and specialized institutions;
- the verification, control and animation of services.
She acts as Government Commissioner to the National Order of Surveyors and the National Order of Chartered Accountants and Chartered Public Accountants.

Moreover, it is thanks to these various structural reforms that the tax, land and state administration of the Republic of Senegal has been able to achieve one of the best performances in the WAEMU zone since 1990.

The General Directorate of Taxes and Domains has particularly benefited from a leadership which, in addition to illuminating the orientations and structural reforms useful for each historical evolution, will have ensured the safeguarding and perpetuation of the gains made.

Appointed at the head of the two essential pillars that are the "fiscal block" and the "land block", the various general directors, each in their own right and in different contexts, have laid the groundwork for the consolidation of an operational economic and social function necessary for the emergence and development of Senegal today under the Empire of the Emerging Senegal Plan and the territorial reform commonly referred to as "Act III of decentralization".

II/ INVENTORY OF STAKEHOLDERS AND EXISTING DATA

It is important to note that Senegal has engaged, in the mid-1990s, a series of reforms supported by the Bretton Woods institutions and other TFPs in order to improve its revenue without increasing the tax burden. Thus, at the fiscal level, two laws were promulgated on February 6, 2004, one modifying certain provisions of the General Tax Code and the other instituting a special procedure to assist with tax regularization. In terms of land registry and domains, the action plan recommended, on the one hand, the establishment of an exhaustive diagnosis of these services with a view to their restructuring and modernization. It is well understood that, in addition to the need to secure the propriété, the cadastre, estates and land conservation offer significant opportunities for mobilizing resources for public finance. In fact, the nine (9) duties and taxes in force in this sub-sector had at the time a derisory return with revenues of nearly 0.25% of the national GDP.

To implement this component of the action plan on the modernization of the cadastre, the State had an international consultancy firm, financed by the World Bank as part of the Private Investment Promotion Project (PPIP), carry out a preliminary study of this modernization on faisabilité. The report resulting from the said study first highlighted Senegal's spécificité, in the sense that cadastral, state and land conservation activities are the exclusive competence of a general directorate within the Ministry of Economy and Finance, whereas in other countries these activities are devolved either to the Ministry of Urban Planning or to the Ministry of Construction and Housing. Secondly, it showed that the image of the
Cadastre and land conservation is tarnished by the persistence of a certain number of constraints in particular:

- the obsolescence of land legislation;
- the manual nature of the operating procedures;
- the lack of human, material and financial resources of state actors in the three areas.

Consequently, the study has recommandé modernization of these activities with a view to restoring confidence between state services, economic operators and development partners. This challenge was déjà taken into account in the National Program for Good Governance (PNBG), developed in June 2002, which is one of the pillars of the strategy to reduce the pauvreté. The actions of the PNBG include six (6) components, namely:

- the improvement of the qualité public service;
- economic governance;
- local governance;
- judicial governance;
- the improvement of the qualité of parliamentary work;
- the development of Information and Communication Technologies.

Taking into account the objectives of the GNP and the extent of the constraints highlighted, the TFPs have manifesté their predisposition to include their support within the framework of the program coordinated by the Delegation for Public Management (DMP). Thus, the United Nations Development Program (UNDP) is in charge of the political and local governance component and the cross-cutting capacity building component. The World Bank, the European Union and the Canadian International Development Agency (CIDA) are involved in the economic governance component and also make commitments on the judicial governance component to support the Justice Sector Program. Other bilateral donors such as the French Cooperation, Belgium, and Japan have also made commitments to contribute to the financing of the GNP.

The dynamics of modernization involved:

- the General Directorate of Taxes and Domains (DGID);
- Cadastre, estates and land conservation (notaries, surveyors, the Dakar City Hall, the Bureau of Topographic Studies);
- the Ministry in charge of Urban and Regional Planning;
- the Automatic Data Processing Branch;
- the Delegation to Public Management;
- TFPs, in particular the UNDP, the World Bank, the European Union, CIDA and AFD;
III/ RESPONSIBILITIES AND COMMITMENT OF THE ACTORS IN THE COLLECTION OF CADASTRAL DATA

The stakeholders in the collection of cadastral data (state and land conservation) are numerous, they can be fully or partially involved. We can retain the following actors:

- the DGID through Domains;
- the DGID through the Directorate of Land Registry;
- the Direction de l'Enregistrement, des Domaines et du Timbre (DEDT);
- the Tax Investigations and Audits Branch (TIAB);
- the Order of Surveyors;
- the Chamber of Notaries;
- the Ministry in charge of Urban and Regional Planning.

The Domain Department

Under the authority of the Director General of Taxes and Domains, the Directorate of Domains is competent for all matters concerning:

- the design and monitoring of strategies defined for good land and property management;
- the implementation of strategies and their evaluation for a good use of the computer tool in the execution of its missions;
- the supervision of the management of the state domain;
- the establishment of conditions necessary for the proper conservation of private property and land rights;
- the control of the management of vacant and masterless assets;
- the monitoring of land operations relating to the national domain;
- the production of studies and support for the development of legislation on land and property.

The Domain Directorate comprises the following cells and offices:

- the "Monitoring and Management Dialogue" Unit; the "Resources" Unit;
- the "Information Technology" Unit;
- the Office of Legal Affairs;
• the Office of Modernization and Documentation.

The "Monitoring and Management Dialogue" Unit is responsible for:

• the reception and transmission of mail from the Domain Department;
• centralization and analysis of data on service performance;
• the preparation of activity reports and action plans; the follow-up of the due diligence assigned to Management.

The "Resources" Unit is in charge of:

• dealing with issues related to the management of credits, material and human resources of the Domain Directorate;
• the management of expropriation credits for public utility purposes as well as credits for the acquisition of real estate for the State.

The "IT Unit" is responsible for handling questions relating to IT and computerized applications used by the Domain Department. It is the correspondent of the IT Office of the Taxpayer Services and IT Department.

The Office of Legal Affairs is responsible for:

• to assist the services of the DLEC in the elaboration of the land and state legislation;
• to assist the services of the DLEC in the management of administrative and jurisdictional litigation in land and property matters;
• to draw up an annual report on the management of the State domain in relation with the operational departments concerned;
• to control the management of vacant and masterless assets;
• to control the implementation of expropriation procedures for reasons of public utility and the exercise of the State's right of pre-emption;
• ensure the coordination of the preparatory work of the Commission de Contrôle des Opérations Domaniales (CCOD) in relation with the operational departments concerned;
• to ensure that the advice of the CDC is properly followed up.

The Office of Legal Affairs includes the following sections:

• Legislation Support Section;
• Procedure Control Section;
• Section "Secretariat of the CCOD".
The Office of Legal Affairs is placed under the authority of an Inspector of Taxes and Domains with at least the rank of principal.

**The Office of Modernization and Documentation** is responsible for:

- the formulation of technical specifications prior to the computerization of the land;
- monitoring the digitization and computerization of services;
- the implementation and monitoring of service interconnection strategies;
- documentation, archives and real estate files;
- the preparation and maintenance of the general table of the State’s properties in relation to the operational departments.

The Office of Modernization and Documentation includes the following sections:

- Section "Studies and Modernization";
- Section "Documentation and Archives".

The Office of Modernization and Documentation is placed under the authority of an Inspector of Taxes and Domains with at least the rank of principal.

The Department of Domains is placed under the authority of an Inspector of Taxes and Domains with at least the rank of principal.

**The Directorate of the Land Registry**

Under the authority of the Director General of Taxes and Domains, the Directorate of Cadastre is competent for all matters relating to the design and evaluation of strategies for land development and cadastre.

As such, she is in charge of:

- monitoring of the application of technical standards for carrying out topographic and evaluation work throughout the national territory;
- the production of studies and support for the development of cadastral legislation;
- the implementation of strategies and their evaluation for a good use of the IT tool in the execution of its missions;
- the supervision of cadastral works of national scope;
- the establishment of a cadastral information system at the national level;
- monitoring the application of methods for revising the valuations of built and non-built properties in order to determine their market value and rental value after determining the discount coefficients.
The Director of the Cadastre is Government Commissioner to the National Order of Surveyors. He sees to the respect of the internal regulations of this order.

The Directorate of Cadastre includes the following cells and offices:

- the "Monitoring and Management Dialogue" Unit;
- the "Resources" Unit;
- the "Information Technology" Unit;
- the Office of Studies and Documentation;
- the Office of Modernization and Supervision of Technical Works.

The "Monitoring and Management Dialogue" Unit is responsible for:

- the reception and transmission of mail from the Land Registry Department; the centralization and analysis of data on the performance of services;
- the preparation of activity reports and action plans;
- the follow-up of the diligence assigned to the services of the Land Registry Department.

The "Resources" Unit is in charge of dealing with questions relating to the management of credits, equipment and human resources of the Land Registry Department.

The "Cellule Informatique" is in charge of supporting and assisting the services of the Cadastre Directorate in IT matters.

She is the correspondent of the Information Technology Office of the Taxpayer Services and Information Technology Department.

The Design and Documentation Office is in charge of the following in relation with the operational departments:

- the supervision of the execution of all basic topographic and cadastral works;
- general work:
  - cadastral triangulation, polygonations, levelling;
  - stereo preparations;
  - development of the technical documents necessary for the drafting of the new land maps;
  - elaboration of technical documents necessary for land studies related to expropriations, real estate acquisitions, the State and National Domain;
• the design and development of survey materials;
• the assistance of the services of the Directorate of Legislation, Studies and Litigation for the elaboration of the cadastral legislation;
• the follow-up of the fiscal mission of the Cadastre;
• the control and centralization of topographic work carried out by public services and private organizations.

The Office of Studies and Documentation includes:

• the basic work section;
• the general works section;
• the evaluation strategies section.

The Office of Studies and Documentation is placed under the authority of a Land Registry Inspector or a Land Registry Surveyor.

The Office of Modernization and Supervision of Technical Works is in charge of the design and monitoring of photogrammetric works. As such, it ensures:

• the follow-up of the digitization and computerization of the services;
• the formulation of technical specifications prior to the computerization of procedures;
• the management of geographic information systems;
• monitoring of the national geomatics plan;
• representation on the National Card Committee.

The Office of Modernization and Supervision of Technical Works includes the following sections:

• Computerization" section;
• Section "Modernization and supervision of technical works".

The Office of Modernization and Supervision of Technical Works is placed under the authority of a Cadastral Inspector or a Cadastral Survey Engineer.

The Directorate of Cadastre is placed under the authority of a Cadastre Inspector with at least the rank of principal. In addition, it should be noted that the Director of the Cadastre also acts as Government Commissioner to the Order of Surveyors (qualité). He ensures compliance with the internal regulations of this order and is also the legally recognized
expert in the physical definition of the parcel, since it is its structure that ensures cadastral conservation. The documents deposited there are authentic and constitute proof of the delimitation and demarcation of the parcels.

Throughout the national territory, the DC has 18 cadastral inspections, including seven (7) in the Dakar region and its environs (Dakar Plateau I Inspection, Dakar Plateau II Inspection, Grand Dakar Inspection, Inspection of Sanitized Plots, Pikine Inspection, Guédiawaye Inspection, Rufisque Inspection), two in the Thies region (Mbour and Thies city); and one cadastral inspection in each of the following regions: Diourbel, Fatick, Kaolack, Kolda, Louga, Matam, Saint Louis, Tambacounda, Thiès and Ziguinchor.

In terms of human resources, DC and its deconcentrated services will have 228 employees in 2020. This number is still insufficient compared to the previously expressed needs of approximately 300 agents.

In terms of topographic equipment, DC has total stations for the fourteen regions and GPS. The total stations are essential electronic devices in the activité cadastral system, particularly for parcelling and demarcation, and are composed of an optical block, tripod, set of reflectors and support rods. Their function is to measure angles and distances to determine the coordinates of the points in levé. They are equipped with magnetic recording systems that allow direct transfer of the survey data to the computer for digitization. With regard to the reproduction of plans, the DC has plan plotters that allow the editing of plans drawn on the computer and the printing of the digital plan on paper.

On the IT front, DC has workstations, software and security and support equipment. The acquisition of aerial views and UAV coverage is the basis of its geographic information system and the production of cadastral maps.

The Directorate of Registration, Domains and Stamps (DEDT) includes:

- the office of revenue collection and centralization;
- the office of public affairs;
- the office of computer works, documentation and archives and the office of management and general affairs.

The Office of State Affairs is responsible for matters relating to the state and national domain. It deals with the inventory and management of state property and concessions; fees for the occupation of the estate; the acquisition and disposal of movable and immovable property belonging to the State and possibly to other public authorities or establishments; the monitoring of the investigation of state affairs; and the control of state operations carried out by the State, secondary authorities and in particular by the municipalities. In addition,
the Office of State Affairs provides the secretariat of the Commission for the Control of State Operations (CCOD) and investigates expropriation procedures on public grounds (utilité), excluding proceedings before the competent courts. This Commission used to meet once every nine months, which contributed to the congestion of services and the increase in the backlog of cases.

Since the entry into force of Order No. 20287 MEF/DGID of December 31, 2013 organizing the General Directorate of Taxes and Domains, the Office of State Affairs is

The Office of Computer Works, Documentation and Archives is in charge of the preparation and maintenance of the general table of state properties, as well as the documentation, archives and real estate files. It is the correspondent of the Office of Information Technology and Modernization of Services of the DGID. The registration and stamp revenue offices, estate offices, and land conservation offices in the tax service centers constitute the external services of the DEDT.

**The Direction de la Vérification et des Enquêtes fiscales (DVEF)** has, among other things, like activité, the audit of comptabilité of companies and the personal tax situation of taxpayers, with regard to one or more categories of taxes, including property taxes and royalties. Its organization chart includes the central services and the external services, each under the autorité of a tax and estate inspector. The central services include: the accounting and personal tax audit brigades; the tax studies and investigations brigade; the office of revenue collection and centralization; the office of computer works; and the administrative and financial office. With regard to human resources, in addition to the Director, the DVEF has a staff of administrative officers, including brigade chiefs, all of whom are senior inspectors; auditing inspectors; controllers in the investigation brigade, controllers in the revenue authority, tax assessment officers in the investigation brigade, tax assessment officers in the revenue authority, tax assessment officers in the legal department, managers, and secretaries.

**The General Directorate of Taxes and Domains (DGID)** administers and coordinates the tax system. The DGID is based on the General Tax Code (CGI), which is governed by the Basic Law 92-40 of July 9, 1992, amended several times, and the decree of December 31, 2013. There are currently about forty (40) taxes levied in Senegal, nine (9) of which are directly related to state and land activities:

- State royalties;
- the rights of publicité;
- the land tax on built and non-built properties;
- tax on real estate capital gains;
• the tax for the removal of household waste.

Under the authority of the Director General of Taxes and Estates, the Directorate General of Taxes and Estates is responsible for all matters concerning:

• direct taxes and assimilated taxes;
• indirect taxes and assimilated taxes other than those payable on importation and exportation;
• registration fees, stamp duty, land registration fees and similar taxes;
• the domain of the State;
• the land organization;
• the cadastre; property that is vacant and without a master or placed under sequestration as a result of a general security measure.

Within the framework of this competence, the General Directorate of Taxes and Domains is in charge of:

• the preparation of legislative and regulatory texts and international conventions of a fiscal nature or with fiscal implications;
• the assessment, liquidation, collection and litigation of taxes and taxes assimilated to them within the limits of its competence;
• tax information, the search for omissions, concealments, inadequacies and generally tax offences;
• the constitution, management and disposal of the State's private real estate domain within the limits of its competences;
• the disposal of the furniture sector;
• of the management of the public domain within the limits of its competences;
• of the recovery of the products of the;
• training and staff development in connection with vocational training schools and specialized institutions;
• the verification, control and animation of services.

She acts as Government Commissioner to the National Order of Surveyors and the National Order of Chartered Accountants and Chartered Public Accountants.

The Director General of Taxes and Domains is the Chairman of the National Accounting Council.

The Director General of Taxes and Estates is assisted in his functions by a Coordinator. The latter is responsible, in particular, for the coordination of the services of the General
Directorate of Taxes and Estates. He is the acting Director General of Taxes and Estates in case of absence.

The Director General of Taxes and Estates is also assisted in his duties by technical advisers and project managers appointed by order of the Minister of Finance. In addition to the departments reporting to him, the General Directorate of Taxes and Taxation includes external departments of equal rank, comprising functional departments and operational departments. In their supervisory, assessment and centralization missions, the functional directors are in contact with the operational directors.

The functional departments are made up of:

- the Internal Control Department;
- the Department of Legislation, Studies and Litigation;
- the Administration and Personnel Department;
- the Direction du Recouvrement;
- the Tax Control and Intelligence Department;
- the Taxpayer Services and Information Technology Department;
- the Domains Department;
- the Land Registry Office.

The operational departments are made up of:

the Specialized Tax Services Branch;

- the Dakar Regional Directorate;
- Regional Services Branch.

The departments attached to the General Directorate of Taxes and Domains are:

- the Office of Monitoring and Synthesis;
- the Office of Strategy and Modernization;
- the Communication Office.

The Office of Monitoring and Synthesis assists the Director General of Taxes and Estates in monitoring the application of the directives that he addresses to the departments, services, technical advisers and project managers.

In addition, it centralizes the activity reports of the directorates, services and those of the technical advisers and project managers. It prepares the management reports of the General Directorate of Taxes and Domains. Finally, it helps to maintain the consistency and
interoperability of the actions of the various bodies of the Directorate General of Taxes and Tax Areas.

The Office of Monitoring and Synthesis also assists the Coordinator of the General Directorate of Taxes and Domains in the performance of his duties. It is placed under the authority of an Inspector of Taxes and Domains with at least the rank of principal. He is responsible for assisting the Director General in defining and implementing the strategic objectives of the General Directorate of Taxes and Estates. In this capacity, the Office of Monitoring and Synthesis:

- Develops and updates the steering instruments of the General Directorate of Taxes and Domains such as the strategic plan and the performance contract;
- Analyzes service productivity using quantitative and qualitative tools such as dashboards, the service performance measurement framework and performance indicators;
- is in charge of keeping and analyzing statistics on the performance of services;
- is in charge of monitoring the various modernization projects of the Directorate General of Taxes and Domains.

The Office of Strategy and Modernization includes the following sections:

- the "Strategy" section;
- the section "Managing Modernization".

It is placed under the authority of an Inspector of Taxes and Domains having at least the rank of principal.

The Communication Office is responsible for:

- to inform taxpayers about their tax obligations;
- implement the internal and external communication policy defined by the General Manager of Taxes and Domains.

The Communication Office includes:

- the "Internal Communication" section;
- the "External Communication" section.

The Communication Office is placed under the authority of an Inspector of Taxes and Domains or any other agent of equal or similar rank.
Each of the above-mentioned Heads of Office may be assisted in the performance of his duties by a Tax and Estate Inspector or by any other officer of grade A or equivalent rank, appointed under the same conditions.

The DGID has 25 tax service centers (CSFs) at the territorial level, which also correspond to cadastral inspections. In addition to the center for large companies and the center for the liberal professions, the CSFs generally include a land registry inspection; one or more tax revenue offices including property tax, state fees, and taxes on household waste; a formalities office, a personal tax office, and a professional tax office.

The Tax Services Centers are placed under the authority of a Tax and Domain Inspector with at least the rank of principal.

The Head of the Tax Services Centre exercises the functions of coordination, animation and general supervision of the services placed under his authority. He ensures the centralization of all the documentation relating to the same taxpayer in a single file. He is in charge of litigation and ensures the custody of taxpayers’ files.

The Head of Center has, as the case may be, as direct interlocutor the Director of Specialized Tax Services, the Regional Director of Dakar or the Director of Regional Services.

The Head of the Center may be assisted in the performance of his duties by a Tax and Domain Inspector having at least the rank of principal, appointed under the same conditions.

The Deputy Head of Centre is in charge in particular of animation, control and training tasks. He ensures the interim of the Head of Center in case of absence. Each Tax Services Center is organized according to the standard organization chart below, except for the Center of Large Enterprises, the Center of Medium-sized Enterprises and the Center of Regulated Professions:

- an **Office of Taxation**, Taxpayer Services and Control divided into management units, in charge of the assessment and settlement of taxes within its jurisdiction. Each Management Unit is headed by an Inspector or a Tax and Domain Controller.
  This office is responsible for the registration of taxpayers, updating of files and archiving. In addition, the Office is in charge of welcoming and assisting users, as well as issuing printed declarations.
  The Office of Taxation and Taxpayer Services is headed by an Inspector of Taxes and Estates;

- a competent **collection office for the** recovery of all taxes, duties and fees.
The Collection Office includes:
+ the "Cash, Payment Tracking, Accounting and Recording" section;
+ the section "Management and Pursuit".

The Collection Office is headed by a Tax and Domain Inspector who may be assisted in his duties by an Inspector or a Tax and Domain Controller;

- an **Office of Domains** competent in the management of public affairs;

- an **Office of Conservation of Property and Land Rights** responsible for the conservation of property and land rights and the administration of vacant properties under curatorship.

The Office of Estates and the Office of Conservation of Property and Land Rights are each headed by an Inspector of Taxes and Estates;

- a **Land Registry Office** competent for cadastral matters.
The Land Registry Office is headed by a Land Registry Inspector or Engineer. Exceptionally, it may be headed by a surveyor with the rank of principal.

- a **Rent Control Office**.
The Rental Control Office is headed by a Land Registry Inspector or Engineer. Exceptionally, it may be headed by a surveyor with the rank of principal.

- of the **attached units** (management follow-up and dialogue, resources, IT);

The national territory is divided into the following Tax Service Centers:

**For the Dakar Region**

1- The Center for Large Enterprises is a specialized center, competent throughout the Dakar region. It is in charge of companies whose turnover excluding taxes is fixed by memorandum of the Director General of Taxes and Domains, excluding regulated professions. It is also responsible for the taxpayers referred to in Articles 90 and 91 above.

In this capacity, it ensures the assessment, liquidation, control and collection of all taxes and duties within its jurisdiction, with the exception of the control devolved to the Control and Intelligence Directorate and land registration rights.

2- The Center for Medium Enterprises is a specialized tax services center, competent in the Dakar region, outside the geographical limits of the current department of Rufisque.
It is responsible for companies whose turnover excluding taxes is set by memorandum of the Chief Executive Officer, excluding regulated professions.

As such, it ensures the assessment, liquidation, control and collection of all taxes and duties within its jurisdiction, with the exception of land registration rights.

3- The Center for Regulated Professions is a specialized Tax Services Center, competent in the department of Dakar.

It is responsible for regulated professions subject to the supervision of a professional order. For members of the National Bar Association of Senegal and those of the Chamber of Notaries of Senegal, the Center’s competence extends to the entire Dakar region.

The Centre for Regulated Professions ensures the assessment, liquidation and collection of all taxes and fees within its jurisdiction, with the exception of land registration fees.

4- The Tax Services Center of Dakar-Plateau, bounded by:

- the sea at the tip of Dakar through Cap Manuel and Soumbédioune Bay to its intersection with the Fann Bel Air bypass; the Fann Bel Air bypass to its intersection with the highway through the Colobane crossroads;
- the highway to its intersection with Malick Sy Avenue, Malick Sy Avenue to Cyrnos intersection, Felix Eboué Avenue to the Fishing Wharf (Mole 10);
- the sea, at the level of the Fishing Quay (Mole 10) to the tip of Dakar.

The competence of the Tax Services Center of Dakar-Plateau covers the communes of Dakar Plateau, Medina, Gueule-Tapée-Fass-Colobane and Korea.

5- The Grand-Dakar Tax Services Centre, bounded by:

- Bourguiba Avenue from its intersection with Dial Diop Boulevard to its intersection with Sheikh Ahmadou Bamba Avenue, from this point to its intersection with the highway, the highway to its intersection with Malick Sy Avenue, Malick Sy Avenue to the Cyrnos intersection, Felix Eboué Avenue to the fishing wharf (Mole 10);

- Bourguiba Avenue from its intersection with Dial Diop Boulevard to its intersection with Route du Front de Terre, Route du Front de Terre to its intersection with the Hann interchange, from the Hann interchange to its intersection with the highway, from this point to its intersection with Route de Cambérène;
- the sea up to the height of the school of Hann Montagne, from this point to the Boulevard du Centenaire of the Commune of Dakar, from the Boulevard du Centenaire of the Commune of Dakar up to its intersection with the Route de Cambérène.

The competence of the Tax Services Centre of Grand-Dakar covers the district municipalities of Grand-Dakar, Biscuiterie, HLM and Hann Bel-Air.

6- The Tax Services Center of Dakar-Liberté, bounded by :

- the West Corniche at the level of Soumbédioune Bay up to the sea level of the wall of the Gendarmerie bridal camp; from this point and its extension up to the North Clearance (VDN) via the so-called "old track"; the north clearance lane up to its intersection with the Front de Terre road; the Front de Terre road up to its intersection with Bourguiba Avenue; Bourguiba Avenue up to its intersection with Dial Diop Boulevard; Dial Diop Boulevard up to its intersection with the Fann Bel-Air bypass;
- the Fann Bel-Air bypass from Soumbédioune Bay to its intersection with Dial Diop Boulevard.

The competence of the Dakar-Liberté Tax Services Center covers the district municipalities of Sicap Liberté-Dieuppeul-Derklé, Fann-Point E- Amitié and Mermoz-Sacré-Cœur.

7- The Tax Services Center of Ngor-almadies, bounded by :

- the maritime height of the wall of the bride and groom’s camp;
- the coastline and its extension to its intersection with the Northern Clearance at the boundary of the Diamalaye district;

8- The Tax Services Center of the Sanitized Plots, delimited by :

- the north clearance lane from its intersection with the Land Front Road to the sea;
- the north clearance lane from its intersection with the Front de Terre road, the Front de Terre road to its intersection with the Hann interchange, from the Hann interchange to its intersection with the highway, from this point to its intersection with the Cambérène road, the Cambérène road to the eastern limit of the village of Cambérène, from this point to the sea to the west;
- the maritime height of the wall of the Gendarmerie Bridal Camp up to its intersection with Cheikh Anta Diop Avenue, Cheikh Anta Diop Avenue up to its intersection with the North Clearance Way via the so-called "old track", the
North Clearance Way from its intersection with the so-called "old track" up to the seafront of the Diamalaye district.

The competence of the Tax Services Center of Ngor-Almadies covers the district municipalities of Yoff, Ouakam and Ngor-Almadies.

The competence of the Centre des Services fiscaux des Parcelles Assainies covers the district municipalities of Grand-Yoff, Parcelles Assainies, Patte-d’Oie and Cambérène.

9- The Pikine Tax Services Center competent in the geographical area of the Pikine department.

10- The Guédiawaye Tax Services Center competent in the geographical area of the department of Guédiawaye.

11- The Rufisque Tax Services Center competent in the geographical area of the department of Rufisque.

For other regions:

1- the Thies Tax Services Center competent in the geographical area of Thies region, excluding Mbour department;

2- the Mbour Tax Services Center competent in the geographical area of Mbour department;

3- the Kaolack Tax Services Center competent in the geographical area of the Kaolack region;

4- the Fatick Tax Services Center competent in the geographical area of the Fatick region;

5- the Ziguinchor Tax Services Center competent in the geographical area of the Ziguinchor region;

6- the Kolda Tax Service Center competent in the geographical area of Kolda region;

7- the Diourbel Tax Services Center competent in the geographical area of the Diourbel region;

8- the Saint-Louis Tax Services Center competent in the geographical area of the Saint-Louis region;
9- the Matam Tax Services Center competent on the geographical area of the Matam region;

10- the Tambacounda Tax Services Center competent in the geographical area of the Tambacounda region;

11- the Louga Tax Services Center competent in the geographical area of the Louga region;

12- the Kaffrine Tax Service Center competent in the geographical area of the Kaffrine region;

13- the Sédhiou Tax Services Center competent in the geographical area of the Sédhiou region;

14- the Kédougou Tax Services Center competent in the geographical area of the Kédougou region.

The DGID’s computer diagram has the following particularity. The applications in operation are housed either at the General Directorate or at the Directorate for Automatic Data Processing (DTAI), which is in charge of defining and implementing the IT policy of the Ministry of the Economy and Finance using the Standard Integrated Government Tax Administration System-SIGTAS software.

**The Directorate of Urban Planning and Architecture** is one of the four directorates of the Ministry in charge of Urban Planning and Regional Development. Its activities concern:

- the elaboration and implementation of urban management tools, in particular the elaboration of land-use planning schemes;
- urban development plans;
- the establishment and management of urban databases;
- the implementation and monitoring of the policy of land restructuring and regularization;
- the promotion of Senegalese architecture and urban aesthetics.

It maintains functional relations with the Land Registry Office. Steps must be taken within the framework of the DGID’s new IT master plan to systematize these relations, particularly during the phase of modernization of cadastral, state and land activities. In a later phase, a system intégré should also be envisaged for the exchange of information on cadastral, domanial and land conservation activities between the structures of the DGID, the Ministry of Urban Planning and Land Development, other stakeholders and users.

**The National Order of Surveyors** was established by Law No. 2000-04 of January 10, 2000. It gathers the persons exclusively entitled to practice the profession of expert surveyors. The
cadastral and land surveying missions of the surveyor mainly concern the parcelling out and delimitation of private property and land expertise. The Director of the Cadastre is the Government Commissioner to this Order and ensures that its internal regulations are respected. He is also the legally recognized expert in the physical definition of the parcel, since it is its structure that ensures cadastral conservation. The documents deposited there are authentic and constitute proof of the delimitation and demarcation of the parcels. It is in this capacity that the State can ask expert surveyors to intervene on the estates and the DC controls them a posteriori.

Notaries are public officers. They are organized in chambers of notaries and are instituted to receive the deeds and contracts to which the parties wish to give or must give the character of authenticity attached to the acts of the public authority in order to ensure the certain date, to keep the deposit, and to deliver large copies, dispatches and excerpts. Notaries provide the public service of proof and authenticity. They manage thousands of files and their activities are affected by the slowness of the procedures for establishing land title. These delays compromise not only the security of the deeds taken with their clients, but above all the volume of their transactions, particularly in terms of access to real estate credit, since the land title is the essential document required by bankers for the granting of a loan. Indeed, before any bank credit file, the notary and the parties must be informed of the state of the registrations that encumber the title concerned and any credit guaranteed by a land title cannot be formalized without this information and the land registry is still not in a position to give this information in time because of the length of the procedures.

IV/ RELIABLE CADASTRAL DATA AND MONITORING OF ODDS

The main constraints identified for the reliability of cadastral data appear from an analysis of the texts, the process of land title creation, the various stakeholders in these sectors and some actions initiated by the State. Thus, the cadastre, estates and land conservation are confronted with three main constraints, namely:

- the obsolescence of texts;
- the lack of knowledge of the real situation of the land;
- the lack of material, human and financial resources of state actors;
- the unsuitability of the organization chart of the single state structure intervening in both sectors.

The obsolescence of the texts results from the very context of their elaboration (colonial period and post-independence). The corollary is a legal void on the use of information technology in operating methods, particularly in the fields and land conservation. It is also
illustrated by the maintenance of manual operating procedures which in turn feed legal insecurity, particularly on rural land in rural areas.

The lack of knowledge of the real situation of land is due to the complexity of the legal framework (national domain, unclassified land, public domain, private domain) and especially to the lack of means at the level of state structures intervening in the cadastral and domain sectors. Apart from the few pieces of land that have given rise to land titles (they are a tiny fraction), particularly in urban areas, the administration has difficulty in taking stock of the real situation of land, particularly in rural areas, because of the inadequacy of material, human and financial resources. The consequence is that the files, which should be dealt with as they are opened, pile up, thus opening the way to multiple attributions and wild occupations of people who, faced with the slowness of the administration, choose as a solution to put it before the fait accompli. As a result of these constraints, contributions from the state budget for built and unbuilt properties are relatively low. Moreover, at the social level, these constraints further increase women's vulnerability in terms of access to property due to the persistence of sociological burdens. In this regard, there is observed a discrepancy between the rights recognized to them by the Constitution and the discriminatory practices exercised in the name of custom, religion and marital authority.

The still relatively satisfactory state of equipment of the state structures involved in the cadastre, estates and land conservation sectors. This partly explains the long time taken to produce land titles, legal insecurity, difficulties in accessing property and the wait-and-see attitude of investors. In addition, for the land registry, the low number of survey engineers and senior survey technicians must be compensated for by a proactive policy of training these essential bodies. The DVEF and the DGID are also faced with the constraints of computer equipment and training in new information technologies (network and messaging administration). It is necessary to continuously strengthen the capacities of these structures and modernize their operating methods.

The above-mentioned constraints have multiple consequences, the most obvious of which is the still inadequate nature of budget revenues from property and state taxes.

V/ ROADMAP FOR STRENGTHENING THE CADASTRAL ECOSYSTEM

In view of the recommendations of the territorial reform of Act III of decentralization, which is entering its second phase of application with the eventual extension of transferred competencies, particularly in the field of agriculture, and considering the numerous socio-economic demands for the development of rural land in support of the territorialization of public policies initiated by the Emerging Senegal Plan, Senegal, faced with the imperative of
territorial development in social cohesion, recommends a reform of the 1964 Law on the National Domain, whose conclusions have been officially submitted to the Authority.

It is obvious that the lessons learned from the current situation of land tenure in both urban and rural areas, marked by speculation and innumerable disputes, lead to a strengthening of the cadastral ecosystem.

**V.1 Objectives of strengthening the cadastral ecosystem**

The objective of strengthening the cadastral ecosystem is to contribute to good governance by improving the mobilization of internal resources and the business environment for sustainable growth with a significant impact on poverty reduction and the achievement of SDOs. More specifically, strengthening the cadastral ecosystem aims to contribute to:

- the **digitization of the urban and rural cadastre** for a perfect mastery of the land to improve the access of the greatest number of people to real estate ownership;
- the **guarantee of land ownership rights** in the land areas which protects the rural population and contains the not very virtuous initiatives of some national and foreign private investors;
- **increasing tax revenues through** the implementation of a reliable and updated real time land and tax database;
- making available to Senegal’s **three hundred and fifty-two (352) communes information and land governance tools** (cadastral plans) in support of their respective Land Use and Occupancy Plans (POAS).

Strengthening the cadastral ecosystem could also have a **positive impact on the mobilization of local internal resources** and the consequent improvement of national public finances. Indeed, the **reliability of the data should make it possible to broaden the tax base** and raise the contribution of land revenues to a significant level in the constitution of the national budget. One of the direct impacts is that **modernization of the land title production and distribution process** will shorten the time required to acquire land title and make it more secure, thereby facilitating access to property. It should attract more foreign economic promoters wishing to invest in Senegal and amplify **transactions between notaries and banks** in charge of granting real estate loans. The implementation of cadastral plans and databases, operated by the DGID’s GIS, will make it easier for local authorities to forecast tax revenues.

The strengthening of the resources of local authorities following the implementation of the rural land registry should make **these authorities financially viable** so that they can effectively take charge of the areas transferred by the State since 1996 (health, education,
estates, environment, etc.) and **further facilitate access by the greatest number of people to better quality basic services**, thus contributing to the achievement of the MDGs. Moreover, with the expected positive effects of the reform of the National Domain Law, the modernization of the cadastre and domain services on land acquisition procedures and access to cadastral information, the number of land conflicts should significantly reduce, particularly double allocations (or duplications), **illegal sales of land** belonging to **others**, and **encroachment on other people’s land** by **recurring problems of communal boundaries**. With the **security of land title**, disadvantaged people who own land should see the spectre of expropriation by a few ill-intentioned wealthy people disappear. As for the disadvantaged people who do not own land, they should have a better chance of gaining **access to land ownership under** simpler and more secure conditions. Finally, with **transparency in the allocation of land titles**, the **conditions of access to housing** should logically improve, as should the living conditions of the poorest populations living in Dakar and in other cities in Senegal, particularly the regional capital cities.

The **impact on the status of women** who could have easier access to land ownership will be a major step forward. It must be said that despite the provisions in favor of women’s access to land, introduced during the revision of the Senegalese constitution in 2001 by referendum, **women still encounter difficulties in accessing land ownership** due to socio-ethnic and religious constraints. However, justice must be done to this eminent actor of economic development, particularly agricultural development.

The strengthening of the cadastral ecosystem guarantees the **provision of reliable and regular information on the real state of the land**, which will enable the State to **anticipate the problems posed by the occupation of land** subject to a constant balancing of its carrying capacity. The latter will be able to **anticipate functional disruptions in time and formulate proactive policies for concerted management**, consistency, rectification of orientations and/or allocations in order to respond effectively and efficiently to the demands of the population and development stakeholders.

The question of the development of a modern multi-purpose cadastre is therefore posed concretely. In this perspective, many tools are today both effective and efficient in view of the results obtained in several countries.

**V.2 Contribution of spatial remote sensing and geographic information systems (GIS) and statistics to the modernization of the national cadastre**

From a practical point of view, P. Dale and J. McLaughlin (1999) have proposed a theoretical model that expresses these new characteristics of cadastres well, integrating in a systemic way the functions of evaluation, securing land rights and controlling land use. They made
certain adjustments to it, notably to further emphasize this idea of an information system, as illustrated by the figure below, which translates the concept of the Cadastral Information System (CIS).

Cadastral Information System Concept (adapted from Dale and McLaughlin, 1999)

*Conceptual model of land information system*

In 1996, following a meeting of cadastral experts in Bogor, Indonesia, FIG (1996) published the *Bogor Declaration* on the Design and Reform of Cadastral Systems in Developing Countries. The experts identified factors for the success of cadastral projects, with a view to creating an efficient real estate market (promoting the adjudication of land rights, land transfer, and land transformation through subdivision and consolidation). This statement also had the merit of identifying an important characteristic of cadastral systems, namely that they are not entirely generalizable and transferable from one country to another. Each cadastral system is a specific case and has to be adapted to the specific needs it has to meet.
Then, in 1999, FIG (1999) presented the Bathurst Declaration on Cadastre and Sustainable Development, as the result of a workshop held in Bathurst, Australia. This declaration clarifies the role and contributions of cadastral systems in land management, land policy development, land use planning, management of urban growth, vulnerability to natural disasters, access to land for women and indigenous or minority groups, etc. The declaration also identifies the role and contributions of cadastral systems to land management, land policy development, land use planning, management of urban growth, vulnerability to natural disasters, access to land for women and indigenous or minority groups, etc. In the light of the concept of sustainable development, this workshop also made it possible to formulate certain findings relating to the concept of land ownership, which contribute to cadastral reflection. First, land ownership rights must be considered from the perspective of the stewardship principle, as they do not include the right to neglect or destroy the territory and its resources. Second, the concept of ownership encompasses social and environmental responsibilities as well as the rights to enjoy property. Thus, cadastral systems should contain not only data on property rights, but also constraints and restrictions on the exercise of such rights.

In parallel with the workshops and expert meetings, FIG had mandated in 1994, a committee of reflection on the modernization of the concept of cadastre. In 1998, this committee presented the results of its work and FIG published a document entitled Cadastre 2014, which sets out the characteristics of the cadastral systems of the future (Kaufmann and Steudler, 1998). The major characteristic of the cadastral systems of the future will be their versatility, supporting the land and parcel information needs of a multitude of users. The cadastral representation will no longer be limited to the mere parcelling foncier; it will also integrate new "objects of the territory" referring to the particular burdens, obligations, and restrictions affecting the land parcel (e.g., easements, flood zones, sensitive environments, etc.). It is anticipated that the cadastre of the future will provide a more complete representation of the "land geography" of an area. The result will be a cadastre composed of several superimposed thematic layers, representing different objects of the territory that intersect with the land parcels.

In light of recent conceptual developments and multidisciplinary contributions on cadastre, several authors now consider this type of information system as one of the instruments of territorial governance (Dale, 2006; Williamson and Ting, 2001; Dale and McLaughlin, 1999; Hendrix, 1997). Although it remains an instrument of public authority, the cadastre also responds to new information needs expressed by private organizations, interest groups, businesses, and the general public. Its conceptual evolution now places it at the center of concerns inherent in the protection of property rights, the structuring of the market economy, the organization of state powers, the application of public policies, and the proper conduct of local governance (see figure below).
However, despite the interest they generate, these conceptual developments in cadastre remain, in many cases, difficult to apply in the field. One of the main criticisms of cadastral projects is that too much attention is paid to technical aspects, which obscures the organizational, legal, political, economic, and cultural dimensions. These projects are poorly designed, misunderstood, and misunderstood; the objectives pursued are often unclear and imprecis; the organizational framework is too rigid and not adapted to the reforms proposed by the project. R. Bennett et al. (2008) point out that the promoters of cadastral reforms and future users must share a common vision of the land object.
represented and registered in the cadastre, and be able to identify and classify the interests, constraints and restrictions affecting the land and its use.

Cadastral projects are generally large-scale: their realization is spread over several years, with significant budgets, involving the contribution of many experts, managers, professionals and technicians, and the implementation of new work methods. The planning and management framework of such projects must be subject to rigorous attention, as D. reports. Grant and D. Roberge (2001) with respect to cadastral projects in Greece and Quebec. Thus, there is a vast field of research to explore the effects and impacts of cadastral systems, which are still too often uncertain (Williamson and Fourie, 1998; Silva and Stubkjaer, 2002).

V.2.1. Implementation of a multi-purpose cadastre in Senegal

Within the framework of mobilizing internal resources and with a view to natural resource and land management, Senegal has an immediate interest in extending the cadastre, which only concerns cities, to rural areas. The cadastre must be multi-purpose and be based on a medium-scale cartography of the space representing in a global and more or less precise manner the meshes of the national territory. The identification of rural and urban heritage, as well as its enhancement and conservation, reveals many problems in Senegal. The implementation of conservation actions for the built or non-built space, requires the possibility of intervening on the physical places, to know their limits, nature, occupation and therefore to identify their real or apparent owners. In most cases, it is extremely difficult to identify the land owner of a piece of land, generally under the regime of undivided ownership or de facto divided between several descendants, without any official act legitimizing the transactions. The lack of application of the provisions of the law on the National Domain, particularly in rural areas, and of the property regimes explains this situation, which is problematic for developers, but normal for the said owners, who have always organized themselves differently, according to their own rules guaranteed by tradition, for whom ownership of the land is the responsibility of an arbitration carried out consensually by the ancestors. In addition to the problems, there are also the mental attitudes determined by belonging, or rather the social hierarchy and sociological considerations, of which belonging to an ethnic group is the determining factor. It is obvious that to establish a land policy, the ideal situation is one where there is a general land registry showing the entire national rural space. In the same way, it appears that the subdivision of land into arable plots must be based on an informed cartography.

The function generally assigned to the cadastre is fiscal. Senegal has reached a level of development of land transactions in urban as well as rural areas where the establishment of proof of the consistency of property is an obligatory prerequisite for securing any
investment. Moreover, it is noted that the land registry services record various requests from citizens, real estate developers, territorial development project holders, etc. on the legal status of land, the identity of owners, land use, etc. Therefore, it seems interesting to consider the potential functions of the cadastre in Senegal, which has entered a phase in its territorial development that calls for a certain degree of standardization. This requires first of all an inventory of fixtures, the knowledge of which can be based on the tools offered by spatial remote sensing and GIS for the production of spatially referenced documents.

V.2.2. Thematic maps

The notion of Cadastre has evolved over the centuries either to adapt to new needs or to apply new techniques. The vocation of the cadastre is the creation of large-scale parcel plans that more or less precisely match the property. However, it is possible to draw a general definition whatever the type of cadastre envisaged. In Senegal, the primary function of the Cadastre must be to make an inventory of land ownership and to provide a more or less detailed description of it, in order to meet individual or collective needs, particularly in terms of taxation, land ownership, legal and economic matters. This inventory most often takes the form of graphic documents (cadastral plans) and literal documentation (registers, files). However, it can be thematically reinforced with a view to making available to the community documents that can answer questions on land tenure, civil and rural engineering, land use, the economy of public services, statistics, science and research.

Thematic maps have a broader spatial scope than that of the cadastre; they relate to the notion of zone, independently of any concern for the configuration of the property: migration zone, fertile zone, zone with non aedificandi potential, fire-sensitive zone, floodable zone, agricultural production zones, etc. However, by acting on scales, it could be admitted that relationships are created between two types of documents. For example, does it not seem interesting to have the cadastral plan take charge of the land use of a rural plot of land? The information is taken from a sufficiently precise thematic map.

To accomplish this task, the techniques generally used are not very efficient in terms of speed. These include aerial photography and survey methods, photogrammetry and photointerpretation. In Senegal, aerial photographs have always been used, particularly in topographic work for the preparation of medium-scale maps.

Today, the use of UAVs makes it possible to revisit photogrammetry, which allows to capture the altimetric and planimetric coordinates of an object determined by measurements made in two photographic images.

The altimetric and planimetric coordinates of an object are determined by measurements made in two or more photographic images taken from different positions. In this technique,
the common points are identified on each image. A pair of images must have these common points. A line of sight can be constructed from the position of the camera to the point of the object. It is the intersection of its rays that determines the three-dimensional position of the point. Thus, photogrammetry increases the quality of thematic maps by improving the human perception (stereoscopic) of the relief of two plane images of an object, taken from two different points of view.

All the choremes can thus be interpreted as accurately as possible and improves the quality of the thematic maps. As far as the Cadastre stricto sensu is concerned, the general procedure of integrating data on residential construction into the repository is facilitated. Many operations can be performed such as:

- accessibility to schools and urban facilities (shortest distance by walking algorithm);
- the simulation of movements on the road network (which improves the calculation of the value of land through its location rent and its position in relation to central locations);
- the topology of the road network with impedance and directions (which helps zoning operations);
- etc.

Thematic maps for land use planning and territorial development can therefore be filled in using the variables in the Cadastre TOPO database and the simulations for opportunity calculations carried out in ArcGIS with, for example, the Network Analyst extension.

V.2.3. 2D and 3D Carto.

It is necessary to specify that for the case of aerial photogrammetry, an airplane equipped with a camera flies over a region, so that a part of the ground appears on two pictures corresponding to two different positions of the plane. The data drawn from the overlapping surface are of great reliability. For example, if one simultaneously observes a photograph with one eye and the second with the other eye thanks to an appropriate optical tool (mirror stereoscope, restitution device, computer equipped with special glasses, etc.), the area of terrain seen on the two images is seen in relief. The human vision indeed makes it possible to see in relief in a wide range of relative arrangements of these two images.
If we dispose of the latter in a relative position exactly similar to the one they had at the time of the shooting, then the observed stereoscopic image is an exact homothety of the real terrain photographed, as long as the shooting chamber is perfect or the image has been corrected for its distortion. To exploit this stereoscopic scene, the restitution camera superimposes on each image a point that human vision will understand as a small object whose position can be moved at will above the image of the terrain thanks to appropriate controls. The operator will therefore have the job of walking this balloon in the image over all the objects to be measured, while the device will archive all the digital information produced. For the observed image to be an exact copy of the measured object, a number of points in the image must be constrained by forcing them to be in similar relative positions to the objects.

By taking over the definition, photogrammetry is the passage from two 2D models of the landscape to a 3D model. Note that an object must be measured at least twice in 2D to be rendered in 3D.

From 2D objects (photographs) to 3D objects
The increasing demands for three-dimensional (3D) information in different urban applications have entrained the definition and implementation of many models and management methods. A good example is found in the development of municipal information systems for which the use of 3D objects is becoming increasingly important. Consequently, CAD systems, which have long offered 3D, have been widely used in the study of urban development. These 3D CAD systems contain 3D visualization tools, links to databases for analysis but are limited in the field of 3D spatial analysis. Thus this 3D trend affects several fields, one of which is the management of the cadastral system.

The term "3D cadastre" was first coined in 1998 with the publication of the report Cadastre 2014 by the International Federation of Surveyors (FIG). This created an inspiration among professionals and public administrations for the implementation of this system. Jantine Esther Stoter’s thesis (2004) entitled "3D Cadastre" was the first study. Since then, several countries around the world have been trying to apply it. The FIG conducted a survey on 3D Cadastre around the world in 1995. The main goal of this survey was to be able to draw up an inventory of the different ways of managing the third dimension in the cadastral system, especially on superimposed properties. Many countries responded to the questionnaire such as Germany, England, Argentina, Australia, Austria, Brazil, China...

In Senegal, over the last few decades, land use has not only increased considerably, but has also become more complex and diversified. This trend requires an accurate and reliable description of land ownership. In absolute terms, a two-dimensional description of property rights is sufficient to provide clear information on the legal status of real estate. In the case of multiple use of space, with property rights underground or above ground (which is beginning to emerge with the emergence of co-ownership), the 2D cadastre is no longer sufficient and this makes it necessary to use three-dimensional information. A 3D base exists for buildings in Dakar, especially for buildings in the city center. One can probably imagine the design of a 3D structure by integrating cadastral data for a management according to a given altitude. Thus to stay in the field of topography, one of the processes indicated for data acquisition is aerial photogrammetry which allows to have, in general, the reconstruction of buildings.
Population growth (now close to 16 million), urban development and urbanization over the last twenty years have increased considerably. Pressure on land use has generated growing interest with an increase in the number of multi-storey buildings (R+2 or 3) and buildings above 8 storeys. Soon, with the emergence of multi-level buildings as a result of "green" urbanization, data management will become increasingly complex, requiring the installation of new systems.

Senegal will have to make a choice between the 3 types of 3D cadastre which exists:

- **the cadastre with a 3D label**, which consists in marking the 3D information on the 2D computerized cadastral plan with the help of the labels. These labels specify to the user the references corresponding to the documents containing the 3D information (deed or plan). In addition to the label, a reference can be added to a legal document or a drawing that illustrates the situation. The reference can be implemented in various ways.

  The owner is therefore responsible for finding other additional information in the administrative offices intended. The disadvantage of this cadastre is that it does not respond to the desired result, that of understanding 3D situations and managing this information. It does not allow the automation and exchange of data;

- **the hybrid cadastre** is a cadastre where we add in the existing 2D parcel, the existing data on 3D terrain. The main represented elements are the physical objects as well as the volume rights attached to the parcel. The result is a hybrid solution to the registration of volume rights and a 3D situation registration. This can be done in the form of text, annotation, plans and sections, 3D drawings or volumes on properties.

  The use of text allows for the alphanumeric identification of the cadastral plan. That is to say, the creation of a link between the cadastral plan and complementary documents explaining the vertical component of superimposed properties. Plans and sections are used to describe the existence of properties superimposed by the plans annexed to the cadastral plan. The 3D drawings allow a representation of the vertical situation.

  The Hybrid Cadastre offers two solutions: the registration of 3D volume rights and the registration of physical objects.

  a. **The registration of volume rights in 3D**
Here, the plot is the starting point of the registration to show the rights and obligations. The volume right is a legal space related to a right attached to a parcel on 3D situations.

The legal space is the space in which the owner of a physical object claims rights in order to secure its possession. For example, the owner of a piece of land may extend into the subsoil and the oversoil. This means that he has a right to the extent of his property while taking into account these rights. In the case of the existence of a tunnel above the parcel, the limits of the tunnel are defined by a volume above the surface. The owner of the parcel is therefore limited in his use of the surface. It is therefore necessary to fix these rights.

Thus, the spatial boundaries of rights must be precisely described in deeds and plans. For example, the right to the height of buildings in the city or the right to build in the basement, a right of way. Thus, 3D situations can be consulted since the rights are linked to a database containing non-spatial information. Note that the installation of these volume rights depends on the country's legal system. A 3D volume right can only be registered when an established right will be recorded in the cadastral registration. A solution is possible to have the spatial extent of any physical object in the cadastral registration. This solution could register a volume containing the legal space of the physical object. This is indeed the case of the alternative of combined 2D/3D.

**b. Registration of physical objects**

In this system, the objects seen in 3D on the plots (constructions or infrastructures that are above or below the surface of the plot) are recorded. This solution can be adapted even in the case of situations that are difficult to represent in 2D. For example, if a tunnel crosses several parcels, only the object will be recorded in its entirety with spatial descriptions using plans or sections. These objects will be added to the geographic data. A physical object registration system can be invoked.

The representation of the object must reflect reality and be constantly updated. These cadastral databases of the physical objects available allow a better overview of reality. They offer a solution for complex buildings or infrastructures.
- **the fully 3D cadastre**, in this system, the 2D parcel is totally abandoned. In the fully 3D cadastre, the rights are no longer established on parcels but defined by studied volumes. They imply areas and volumes to which the rights are attached.

### V.2.4. Statistical modelling

Statistics must be central to the design of the Cadastre. It allows the modeling of the stakes involved in urban sprawl and provides the keys to coherent land use planning. The importance of statistics is proportional to the interest of various disciplines such as geography, economics, spatial planning, landscape ecology, etc., some of which have been federated for nearly 20 years within the *Land Change Sciences-Sciences of Territorial Dynamics*. These sciences have very early on found in modeling the methods and tools to observe and analyze the spatial dynamics related to the observed changes. In return, they have made a very significant contribution to the development of geomatics tools and methods that have enabled the design of Cadastral Information Systems.

Within the families of models often distinguished in the literature (Agarwal *et al.*, 2002; Lambin and Geist, 2006), one can select methods aimed at identifying transition rules, on the one hand, and methods aimed at evaluating the likely impact of evolutionary scenarios (Le Berre *et al.*, 2016) and exploring possible future types of occupation and landscapes (Houet and Gourmelon, 2014), on the other hand. The former can moreover be integrated into the simulations conducted with the latter. The first family includes empirical and statistical models in which the observed changes are linked to exogenous variables. Among the models used, regression methods are a particularly relevant approach (Kestens *et al.*, 2008; Kirk *et al.*, 2011) insofar as they allow testing the relative contribution of each variable to the model, while controlling for their feedback because they can be associated with each other (Le Berre *et al.*, 2016). Concretely, the aim is to establish the relationship between the construction date of a plot and its spatial and environmental characteristics. The construction of an exhaustive and regularly updated database therefore remains a necessity.

### V.2.5. Methodology for the elaboration of the comic book

The development of the database is based on three steps: (i) the evaluation of the development status of each parcel (already built or available) year by year; (ii) the description of the context of urban and peri-urban evolution from the physical, environmental and regulatory points of view; (iii) the filtering of the available parcels according to the land use restrictions linked to the regulations in force and to certain developments, in order to keep, year after year, only the parcels suitable for construction.

- **Cadastral referential**
Administered by the Direction Générale des Impôts et Domianes (DGID), the cadastre provides "an exhaustive and permanent inventory, descriptive and evaluative of land ownership" which has been progressively digitized for more than ten years. The project to support the modernization of the cadastre (PAMOCA) has provided Senegal's 40 largest cities with a cadastral map that can be consulted on the Internet and a digital cadastral matrix. It has also provided the tax services with the technical and human resources they need to fulfill their mission of transparent land management with the aim of ensuring good economic governance. The results achieved by PAMOCA are diverse, ranging from the improvement of tax revenues to land conservation, to the strengthening of the DGID’s capacities in the administration of computer networks and public financial management systems.

Today, the cadastre is distinguished by the notable advances in favor of geomatics, with the advent of NICAD (Cadastral Identification Number) as the primary key for cadastral reference databases, the adoption of a graphic charter for data harmonization and integration, and aerial surveys by topographic UAVs.

Since the beginning of the 2000s, the Land Registry Department has begun a vast project to digitize cadastral data. Thus, throughout Senegal, all the technical files of land titles have been scanned in order to secure them. In addition, all the parcel plans that were drawn up on paper were digitized and merged into a single file at each land registry office of the Tax Service Centers.

In 2004, an aerial coverage allowed the mapping of 40 communes in Senegal. A second aerial survey in 2008 extended the cartographic coverage to 36 other localities in the country. In the end, it is the merging of the digitized parcel of land with the 2004 and 2008 cartographies that is the basis of the first digital plan. This plan needs continuous updating in order to regularly take into account all the changes related to land use. It must also be extended to all other localities in the territory. The scope of the tasks and the deadlines are such that other technologies had to be used in order to have a national cadastral plan in the short term.

The cadastral plan, composed of graphic and attribute data, is a support for all development activities. As such, it can be used for

- with the help of NICAD, the exhaustive census of taxable goods and persons and the broadening of the tax base;
- using NICAD as an addressing tool for mail routing;
- to all network managers (water, electricity, telephone, etc.) for the definition of rights-of-way and the location of subscribers;
- to all users, at the request of regularization of occupation, building permits, location plan, creation of businesses, etc.
- **the map: a large-scale repository**

The Cadastre is competent in large-scale cartography, it is both a supplier of data through the plan and a receiver for the needs of its updating. The sharing of information has always been a strong concern in large-scale mapping. The request by mail to the Land Registry Department by all the land actors for the needs of making cartographic data available is unconditionally satisfied. Moreover, the Land Registry Office has made available to the National Order of Expert Surveyors a directory of one thousand six hundred points scattered throughout the territory for the needs of field work.

The topographic database or TOPO DB is made up of several vector layers of thematic information that provide a detailed description of the right-of-way and certain characteristics of communication routes, transportation networks, hydrography, various lines and boundaries, buildings, vegetation and altimetry. Thematic layers from the TOPO DB can also be extracted to provide information on the following themes: municipal boundaries, road network, as well as some entities useful for the production of the inconstructibility filters.

- **Unconstructible areas**

In Senegal, the unconstructibility is a major problem. It is not just a question of taking into account potentially constructible plots that are already built. As a general rule, three types of constraints characterize inconstructibility:

**a) Incompatible or restricted land use** which includes large facilities such as cemeteries, railway rights-of-way, ports and airports. The corresponding rights-of-way must be extracted from the TOPO DB. In addition, military sites must be the subject of special investigations to be able to date them. The same procedure is to be applied for mines and quarries.

**b) Risk protection zones** mainly concern establishments classified as industrial risk and SEVESO sites, which result in a real exclusion from construction.

**c) Environmental protection and conservation areas** bring together different tools that constrain urbanization (national laws and international conventions). These include coastal land, sensitive natural areas, classified forests, ecosystem reserves, national reserves, national parks, water catchment areas, classified sites, etc.

**V.3 Content of the roadmap**
This could consist of three components that would constitute the solutions proposed by SDSN and its strategic partners to:

- the strengthening of the cadastre itself;
- the strengthening of the fields, audit and tax investigation;
- strengthening the administration and coordination of the tax system.

Indeed, various administrative, technical and organizational recommendations make up the content of the roadmap. Among others, the following achievements that depend on the commitment of the State are expected from the project:

- the adoption of the new law on the National Domain and land ownership;
- the completion of a study on the reform of the Senegalese tax administration which will lead to a new organizational chart based on digitized cadastral, state and land conservation activities in relation to the local authorities whose powers were confirmed in 1996 by Act III of decentralization, while recommending the transfer of additional powers;
- updating the DGID’s IT master plan for:
  - a better knowledge of the real state of urban and rural land by an exhaustive mapping of the current dynamics;
  - a better understanding of the contribution of wealth-producing sectors to tax revenues;
  - better medium- and long-term revenue forecasting thanks to a simulation model that enables local authorities to draw up effective and efficient development plans;
  - a better territorial prospective taking into account the capital gains generated by the achievements undertaken within the framework of the Emerging Senegal Plan (PSE) and within the framework of sectoral plans;
- the monography of reference habitats and the elaboration of cartographic conservation by aerial view (UAV coverage) supplemented by the reality on the ground;
- the realization of the study on the computerization of land conservation in the Dakar-Thiès-Mbour triangle which polarizes the main land tenure issues;
- the consolidation of the national cadastral plan (including the rural cadastre) on the basis of the cadastral plans obtained from monographic studies and cartography resulting from the adaptation of aerial views (aerial photographs, satellite images, orthoplan-drone and Digital Terrain Model (DTM), orthophotographs or orthoimages,
orthoplans, etc.), and the development of a national cadastral plan. ) to the reality of the terrain.

The roadmap proposes actions to modernize and bring the instruments and tools used by the state and cadastral services into line with the reality on the ground. A work of capacitation and updating must be done to :

- improving the quality of public service (dematerialization, reception and settlement of disputes and litigation);
- the economic governance of land in its entirety;
- local governance in order to map the typology of land with the objective of its valorization (community lands, arable land, aedificandi land, non aedificandi land, areas of ecological interest to be protected, etc.);
- judicial governance by redefining (clarifying) the responsibilities between the State and the local authorities and harmonizing procedures;
- the improvement of the qualité of the parliamentary work through the provision of land information when the latter decides on the final allocation of land;
- the development of Information and Communication Technologies, particularly in rural communities.

V. 4 Priority and Agenda of the Roadmap

In 2005, the European Union, the African Development Fund (ADF) of the African Development Bank (ADB) and the State of Senegal approved funding of more than 17 billion CFA francs for the conduct of a Project to Support the Modernization of the Cadastre (PAMOCA). The results obtained are obvious. However, private investment in land is now accelerating and is having a significant impact on socio-economic balances and the land rights of users of the land and its resources. It is important to note that this concerns the largest number (more than 60% of Senegalese), hence :

in the immediate future,

- the urgent need to implement a program for the formalization and systematic registration of land rights, taking into account the social arrangements and regulatory methods put in place at the local level;
- the need to develop a land information system dedicated to local authorities to improve land governance and provide a framework for investment in the agricultural sector (cadastre, rural land plan, etc.);
- the obligation to organize, under the aegis of a technical committee on "Land use planning and territorial development", multi-stakeholder study days that
would analyze issues related to land tenure security, new legislation, territorial marketing, etc.;

in the **short term**,  

- facilitate **the creation of a National Commission for Territorial Cohesion (CNCT)**  
- assist in the **design of an action plan for new ruralities**  
- advising on the **development of specific territorial contracts between third party investors and territories in order to follow investment policy and corporate social responsibility**

in the **medium term**,  

- **Strengthening the dialogue between the State and the local authorities to accompany the transformation of the land**;  
- **Supporting institutional changes** by adapting the modes of contractualization between the State and local authorities;  
- the **integration of Civil Society in the CNCT in order to facilitate the mobilization of neighborhoods for the implementation of partnership projects for land development and major urban planning and urbanization operations.**
CONCLUSION

The revolution in cadastral data is helping to improve land management and development monitoring in Senegal. Beyond the acquisition of information by satellite, the drones have made it possible to capture all the subtleties of the surface through point clouds, orthoplans and DTM's.

Today, the intensity and scale of the data revolution, beyond the multiple impacts of digital technology on daily life, can be assessed in the light of the exponential growth of digital information online, and the emergence of new professions such as data scientists, data activists and data evangelists. In essence, any revolution upsets the established order, and the revolution in cadastral data will overturn traditional modes of economic production and societal reproduction. The aim is to better prepare Senegal for this revolution through the innovative use of geospatial data produced by new acquisition technologies (spatio-maps, orthoplans, etc.) and those from new megadata sources. The Agence Nationale de la Statistique et de la Démographie (ANSD) has a key role to play in mobilizing information and will have to apply itself to the creation of intelligent indicators to strengthen its modeling schemes.

In addition, megadata can be used to achieve sustainable development objectives by mapping anonymized target populations for the application of programs for medico-social protection, personal development and adjustment of living environment amenities. The manipulation of cadastral data and thematic maps for territorial development requires a technical partnership between the DGID and ANSD with the main objective of establishing a virtuous circle of production so that the information used by those responsible for public action is selected, analyzed and structured. The aim is to propose a reference frame for management assistance/decision-making adapted to the needs of socio-economic and territorial actors and equipped with a dashboard for the evaluation of public policies.
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