

# **Characterization of the Colombian Territorial Administration System: Multipurpose Cadastre, dimensions, challenges, and “Geography for Life” (2016-2023)**

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**KEY WORDS:** Multipurpose Cadastre, dimensions, challenges, system and territory.

## **SUMMARY**

With the intention of characterizing the Colombian Territorial Administration System (TAS) (2016-2023), the recent circumstances of this system are analyzed, with emphasis on its affinity with the Multipurpose Cadastre, the dimensions for its mission development are identified, and the challenges that emerge in its implementation are described. TAS is defined by Enemark, Rajabifard and Williamson, whose theoretical postulates are accepted by national entities to compose CONPES documents. However, the Colombian TAS is feeble. It is not formally constituted, there is still a lack of awareness of the role played by some agents in its execution, it is exposed to sudden regulatory transitions and to a marked shortage of professionals to study and review it. Nevertheless, within the framework of the National Development Plan (2022-2026), from the IGAC, with the support of similar institutions, formidable efforts are being made from administrative, scientific and operational levels, in an atmosphere of “Geography for Life”, for the optimal management of the TAS.

## **RESUMEN**

Con la intención de caracterizar el Sistema de Administración Territorial (SAT) colombiano (2016-2023), se analizan las circunstancias recientes de este sistema, con énfasis en su afinidad con el Catastro Multipropósito, se identifican las dimensiones para su desarrollo misional y se describen los retos que emergen en su implementación. El SAT es definido por Enemark, Rajabifard y Williamson, cuyos postulados teóricos son acogidos por entidades nacionales para componer los documentos CONPES. Sin embargo, el SAT colombiano es débil. No está formalmente constituido, persiste el desconocimiento del papel que juegan algunos agentes en su ejecución, está expuesto a repentinas transiciones normativas y a una marcada escasez de profesionales para su estudio y revisión. No obstante, en el marco del Plan Nacional de Desarrollo (2022-2026), desde el IGAC, con el apoyo de instituciones afines, se están realizando formidables esfuerzos desde los niveles administrativo, científico y operativo, en un ambiente de “Geografía para la Vida”, para la óptima gestión del SAT.

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## 1. INTRODUCTION

The research characterizes the Territorial Administration System (TAS) in Colombia (2016-2023), the moment when the Peace Agreement was signed and when the Multipurpose Cadastre<sup>1</sup> was officially born as an official initiative for land use planning, until today, when public projects for cadastral development are promoted under a national commitment that is disseminated from the slogan “Geography for Life”. Thus, a “de facto” TAS has been developed in Colombia, which has not yet been formalized, but which functions to a certain extent with certain particularities.

Between 2016 and 2023, the TAS has adopted a series of specific characteristics, the result of the context that Colombia is facing in terms of digital transformation, accompanied by socio-political factors such as the signing of the Peace Agreement, the implementation of policies focused on territorial management, the implementation of the Multipurpose Cadastre, the Land Management Plans<sup>2</sup> and the property registry. In view of the above, it is important to point out that, in order to achieve the objective of carrying out a comprehensive characterization of the TAS (2016-2023), an explanation and subsequent description of its current circumstance is made within the framework of a “Geography for Life” (a concept presented in the National Development Plan 2022-2026: “Colombia World Power of Life”<sup>3</sup>), together with an exposition of its dimensions, and challenges that surface in its implementation. In this sense, and because of how the TAS has developed in the contemporary Colombian context, the inquiry is exploratory in scope.

Even though explanatory public policy documents have been drafted describing its legal nature and purposes, they do not have sufficient scope to explain these characteristics, due to the changing and evolving conditions of the TAS; the result of the repeated incorporation of various stakeholders, the adoption of multiple standards, and the adjustment of a number of technical and legal implementation errors. As has happened in the TAS drive, where the cadastre and the land registry were totally disconnected, and for that reason it is going through a transition process where the actors involved have reached

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<sup>1</sup> System that "registers updated land data, based on formal and informal properties. The information obtained contains specifications on rights, responsibilities, restrictions, geometric descriptions, values [...]; and registers interests on the properties, in terms of occupation, value, use and urbanization" (IGAC, 2023, para.1).

<sup>2</sup> This is the basic instrument defined in Law 388 of 1997, for the country's municipalities and districts to plan land use planning. The POT contains a set of objectives, policies, strategies, goals, programs, actions and regulations that guide the physical development of the territory and land use.

<sup>3</sup> Approved by Law 2294 of 2023, its objective is to lay the foundations for the country to become a leader in the protection of life through the construction of a new social contract that favors the overcoming of historical injustices and exclusions,

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the non-repetition of conflict, a change in our relationship with the environment and a productive transformation based on knowledge and harmony with nature (Congress of Colombia, 2023, para.1)

agreements to act under the TAS standards, the international standard ISO: 19152 of 2012<sup>4</sup>, and the adoption of the LADM-COL Model<sup>5</sup> (MINTIC, 2015).

Now, in a “Geography for Life” environment, it is necessary to link the actors responsible for the TAS, since the transitions and coupling of the system are not instantaneous and require long periods of time for their preparation, adaptation of the information and training of the personnel who produce, process and analyze the territorial information. Thus, the research is developed through a series of sections where, in the first instance, a general scenario is presented where the research problem is stated. From the formulation of the problem, the central question is presented, together with its respective justification. Secondly, a frame of reference is presented, emphasizing the methodology and theoretical direction of the project.

Then, the specific goals are addressed in 3 sections in which the contemporary situation of the TAS in a “Geography for Life” domain is described, then its dimensions are presented, and the challenges associated with its implementation and successful implementation are enunciated. At the end, the respective conjectures of the research are presented, and the bibliographical references consulted are listed. The construction and development of this research is achieved through the bibliographic consultation of academic notes and contributions, official documents issued by public entities, conjectures and experiences present in official archives, book chapters, and articles in indexed journals as a result of research by numerous experts in the fields of cadastral engineering and geodesy, land administration, etc. The contents presented in this work are supported by diagrams, organization charts and different graphic aids.

## **2. FRAME OF REFERENCE: PROBLEM, THEORETICAL APPROACH AND METHODOLOGY**

The discussion on how the territory should be managed has been taking center stage globally, and especially in the recent Colombian socio-political context. In fact, today it takes more strength and relevance after the signing of the Final Peace Agreement (2016): “For the Termination of the Conflict and the Construction of a Stable and Lasting Peace”, which was signed in Cartagena de Indias, between the national government and the extinct Revolutionary Armed Forces of Colombia-People's Army (FARC-EP)<sup>6</sup> (Insight Crime, 2023).

The Agreement highlights, among one of its essential appendices, the need to promote a comprehensive rural reform, better known under the slogan: “Towards a new countryside”, an instance where projects related to comprehensive development, restitution, massive

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<sup>4</sup> International regulation that seeks the semantic standardization of territorial information through the creation of a data model comprising the definition of possible relationships between different territorial objects, of rights, responsibilities and restrictions related to territorial administration (MINTIC, 2015, p.5).

<sup>5</sup> It defines the semantics and data structure for the information of the physical, legal and economic components of the multipurpose cadastral formation or updating processes (IGAC, 2023, para.4).

<sup>6</sup> Main Colombian guerrilla, of Marxist-Leninist ideology. Upon signing the Peace Accord, it disintegrated into a series of organizations that formed the Colombian Territorial Administration System (MINTIC, 2016). Multipurpose Cadastre, dimensions, challenges, and “Geography for Life” (2016-2023) (12337)

formalization of small and medium rural property, updating of the cadastre and rural property tax, protection of reserve zones, and mechanisms to promote access to land (Cancillería, 2016). At this juncture, there are multiple emerging functions and tasks that seek to meet the goals of the Peace Agreement.

For this reason, there is now a specific initiative that seeks to strengthen the TAS in all its implementation, and that is the implementation of the Multipurpose Cadastre (DNP, 2016). Design that, plays the role of “nodal axis” to census land and properties, as the basis of the search for legal security of land tenure on an indispensable condition; towards the desired elimination of Colombia's historical conflicts. Together with the implementation of a new cadastre model, with a multipurpose approach, which emerges in Colombia with the need to think not only in the census exercise (cadastral), but better, in a practice with greater scope that articulates the set of units, entities, jurisdictions and dimensions on land tenure relations: the optimal administration of the territory (DNP, 2022).

It should be noted that the problem lies in the fact that Colombia has always had a tacit, or “de facto”, and quasi-informal and rudimentary TAS, implemented on the fly, which has withstood the ups and downs of geo-historical, socio-political and institutional hardships. According to CONPES 4007<sup>7</sup>, a document issued by the National Planning Department (DNP)<sup>8</sup>, the TAS is purely fragile, as it is not formally constituted, and for this reason, there is a lack of knowledge of the role played by some actors in its deployment (Rodríguez-Ospino, 2020).

With this drawback, each actor establishes its own standards, thus generating obstacles for the transfer and multiplicity of territorial information. In this field, it is necessary to characterize the TAS, taking into account its dimensions, recent circumstances and main challenges, both classic and emerging. The difference between the contemporary context and what has been done traditionally is that today, at the level of “Geography for Life”, it is desired to formalize the TAS, under the structure of a series of duly implemented institutional, normative and regulatory frameworks.

The urgency of generating a space for academic discussion that allows us to “put on the table” what the new perspectives of territorial administration imply in the field of TAS, makes this research address the following question: *What are the essential characteristics of the Territorial Administration System (TAS) in a contemporary Colombian socio-political scenario (2016-2023), where the Multipurpose Cadastre prevails in the framework of “Geography for Life”?* Faced with such an unknown, it is essential to clarify that, in practice, what can be called in the Colombian environment, as the TAS, pre-exists, and has been constituted on the fly. This has meant that the institutional processes have a

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<sup>7</sup> Document: National Economic and Social Policy Council (CONPES) No. 4007 "Strategy for Strengthening Governance in the Territorial Administration System", published by the National Planning Department (DNP), together with the Ministry of Information and Communication Technologies (MINTIC), the Ministry of Housing, City and Territory (Minvivienda), the National Administrative Department of Statistics (DANE), and the Administrative Department of Public Administration (DAFP).

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<sup>8</sup> Se encarga de planificar el desarrollo del país a través de la coordinación, diseño y apoyo en la formulación de políticas públicas y en la planeación del presupuesto de los recursos de inversión (DNP, 2022). Characterization of the Colombian Territorial Administration System: Multipurpose Cadastre, dimensions, challenges, and “Geography for Life” (2016-2023) (12337)

weak and unsatisfactory relationship with respect to the understanding of the certainty of tenure, value, land use, and even their socio-cultural and territorial relations and characteristics.

In the first instance, there was a pre-existing land administration, where the territorial information systems were disconnected, as was the cadastre and the registries. In contrast, it can now be seen that, due to inefficiency and the adoption of public policies within the framework of the “Post-agreement”, the TAS has changed structurally and conceptually. In general terms, the administration of the territory is carried out with the integration of different territorial information systems, that is to say, a TAS has been developed, where at first the interoperability of the cadastre-registry is established, and standards are adopted for the integrity of the information. Also, public and private actors are included, together with the adoption of methods for the transfer of information and knowledge among the competent parties.

Now, the contemporary incursion of territorial administration has led those interested in territorial management and governors, to have a holistic conception of territorial administration, in view of the fact that, since 2016, the Multipurpose Cadastre (set out in CONPES 3859)<sup>9</sup> entered the scene. Where the TAS, involves territorial information systems, and it should be taken into account that, the errors and successes that occur in the TAS, are the consequence of the interaction between its central components; cadastre, registration and land use planning. This makes it necessary to establish standards so that the components that make up the TAS function in a synchronized manner, in order to achieve goals associated with land management and administration.

With the progress of the discussions on the dimensions, challenges and perspectives associated with the TAS, it is necessary that, from the academic perspectives of public administration and cadastral engineering, an analysis be made on what the incursion of this perspective has implied in Colombia, together with its paths and connections. Therefore, it is meaningful to document the scope of formalizing a TAS with the characteristics assigned to it. It is essential to state that, at present, the components of the TAS are in full consolidation.

Likewise, during this stage, the elements inherent to the system require adequate standardization with a view to adapting them to international regulations and statutes and, above all, so that their properties coincide with the variables that serve as the logical basis of the LADM-COL Model and ISO: 19152 of 2012 (MINTIC, 2015). This has generated that, from the institutions in charge of the operation and development of the TAS, a diagnosis of the territorial information is made, and initiatives are proposed for the adoption

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<sup>9</sup> CONPES Document 3859 "Policy for the adoption and implementation of a Rural-Urban Multipurpose Cadastre". Where it is clarified that, in the scenario of a Colombia at peace, the Multipurpose Cadastre is presented as an opportunity to solve the problems related to land management that have afflicted Colombian society for decades (DAR, 2016, p.5). Characterization of the Colombian Territorial Administration System: Multipurpose Cadastre, dimensions, challenges, and “Geography for Life” (2016-2023) (12337)

of some reforms, seeing that, the system is subject to regulatory changes for its correct implementation.

For this reason, the TAS is in a situation of evolution; therefore, the processes of incorporation of territorial information systems are points of great importance, where progress has been made in the interoperability between the cadastre and the registry. And, recently the territorial planning has been linked, which is under study and coupling, with the above, it is established that the integration of information systems must be gradual. In the CONPES 4007 it is clarified that, the TAS has had an important renovation, where the Multipurpose Cadastre, has given it an integral approach, which wants to contribute to the sustainable advancement of the territory, in which a holistic vision of the competencies and functions of; development, tenure, use and value is incorporated, to satisfy needs aligned to the economic development, environmental management and social stability (DNP, 2020).

In this field, aspects such as an integrated management framework for processes related to territorial administration must be taken into consideration, together with adequate articulation and coordination among actors, and the implementation of plans based on information associated with the territory (Enemark et al., 2010, p.40). The DNP clarifies that the TAS “constitutes a government policy [...] that seeks to harmonize the main processes of transformation of territorial management” (2021a, p.3). The TAS is associated with laws, institutions and processes where “citizens request procedures, permits or licenses related to the territory and institutions make decisions to promote development. It is like “machinery that needs its parts to work in a coordinated manner to be effective” (DNP, 2021b, p.5). The DNP, clarifies that, among the principles for governance in the TAS framework, efficiency, effectiveness and transparency predominate (Samsudin, 2014).

After exposing the research problem, it is imperative to highlight that this work is built through an exhaustive research exercise where a qualitative methodology is used, where a delimited period (2016-2023) is taken into account to characterize the TAS; its current situation, dimensions and challenges. Qualitative research is that which “studies the quality of activities, relationships, issues, means, materials or instruments in a given situation or problem. It seeks to achieve a holistic description, [...], which attempts to analyze, in great detail, a particular issue or activity” (Vera, 2018, p.1). An information gathering technique better known as bibliographic analysis is implemented. Ayala (2020), describes this skill as a study of “existing bibliographic material regarding the subject to be studied [...], it includes a set of phases that include observation, inquiry, interpretation, reflection and analysis to obtain necessary bases for the development of any study” (para.3).

In addition to the methodological framework, a theoretical approach is adopted, where the reasoning of Enemark, Rajabifard and Williamson on the TAS is taken into consideration. Which are complemented in parallel with the conception of territory offered by Rosero and Sarmiento (2020), based on the statements of Beuf (2017), a notion understood as a “political-administrative space identified by limits or boundaries, administered or managed by authorities whose legitimacy allows them to make and implement decisions [...],

this political-administrative space can be the national State or a territorial entity in this case the municipalities” (p.39).

For Enemark (2004), the construction of state systems of territorial administration is to determine the basic infrastructure for the implementation of land management strategies (policies) in support of sustainable development. Williamson (2001) establishes that the basis of a TAS is based on the cadastre, which should assist the functions of land tenure, value, use and development. Thus, within the system, the cadastre (or cadastral gear) becomes the “technical engine” that provides the capacity to manage the territory.

In the case of Rajabifard et al. (2004), the deployment of the TAS is the responsibility of government entities, where processes are carried out through technical tools for data collection and references. Notes and information play a fundamental role, since the TAS provides clear and reliable data to the public, and offers essential inputs to leaders for judicious decision making. The earth sciences and the fundamentals of land administration are rigorously linked, since the use of technologies and innovative methods to fine-tune processes are the challenges facing systemic procedures (modern and traditional) (Rajabifard et al. 2004).

Enemark and Williamson, conduct an analysis of the TAS and, in particular, on the underlying spatial framework of large-scale mapping, which should be designed to manage solutions to current problems with participatory and inclusive approaches where human needs are met, rather than simply following more advanced technical standards. Under the framework of optimization and optimal land administration, it is necessary to mention that land is one of the most valued and valuable resources of the community, and its administration and management require a full and optimized approach (Enemark and Williamson, 2004).

Therefore, efficient administration systems, with their underlying cadastral diagnostics, are crucial for intelligent resource management. Reforms, in the field of TAS itself, are mainly driven by political-economic schemes, but increasingly by the need to address social and environmental challenges, as well as by the pressure exerted by technological evolution and organizational and/or regulatory transformations. The urgency of assessing management systems and documenting their alterations, challenges, and dynamics is almost as paramount as the functioning of the system itself.

Considering the above, the productivity and performance of the TAS is being evaluated by international organizations and national entities (mayors' offices, governors' offices, etc.), as well as by the territorial administration agencies themselves, in order to assess the systems for planning, sponsoring or carrying out reform projects (Rajabifard et al., 2004). As a conclusion to this section, it is necessary to say that, according to Enemark et al. (2010) the TAS is “an infrastructure that includes institutional arrangements, a legal framework, processes, standards, information, management and dissemination systems, and

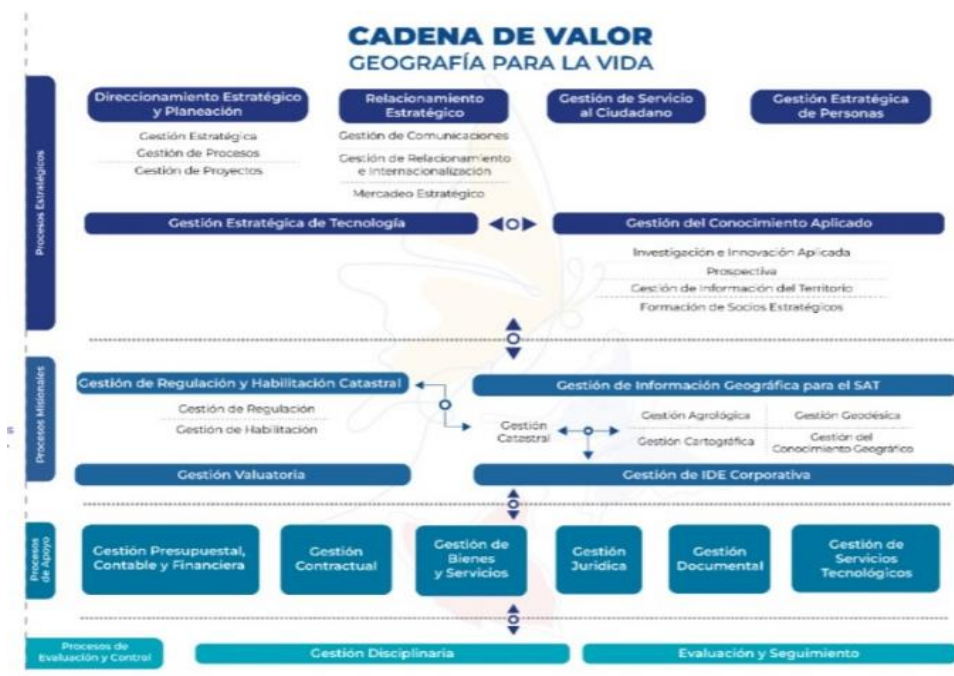
the technologies required to implement land policies and land administration strategies” (p.39).

### 3. RECENT CIRCUMSTANCE OF THE COLOMBIAN TERRITORIAL ADMINISTRATION SYSTEM (2016-2023)

Some particularities on the contemporary panorama of the Colombian TAS and its transcendence at the national level are presented in a document<sup>10</sup> issued by the General Directorate of IGAC. In it, the role played by the entity in the implementation of the 5 axioms that are expressed in the National Development Plan 2022-2026: “Colombia World Power of Life” is widely highlighted (and in depth). It is necessary to highlight that, from the departments, directorates and offices that make up the institution, joint efforts are made, where a complex process associated to a specific value chain (figure No.1) is followed, in order to meet the goals proposed by the national government.

Among the main points or goals highlighted throughout the National Development Plan 2022-2026 are, in the first instance, territorial planning around water and environmental justice. In second place is the strengthening of strategies to guarantee the human right to food, followed by other goals such as the generation of regional convergence, human security and social justice, and last (but not least) is the transformation that alludes to internationalization, the productive economy for life and climate action.

**Figure No.1: Value Chain “Geography for Life”.**



Source: IGAC (2023).

Characterization of the Colombian Territorial Administration System: Multipurpose Cadastre, dimensions, challenges, and “Geography for Life” (2016-2023) (12337)

Federico Pinzón Arana, Johan Andrés Avendaño Arias and Daniel Estiven González Ríos (Colombia)



Now, the issues or transformations that are proposed as nodal axes in the National Development Plan are perfectly related to the TAS, given that they are understood as transversal guidelines for the proper functioning of the territory, which must be developed in a sustainable manner to meet environmental and human needs. Thus, the point that emphasizes land management around water and environmental justice is a fundamental point in the agenda of the current government, which wants to carry out a massive delivery, along with the formalization of small and medium rural property, and of course, accelerate the Multipurpose Cadastre. “To consolidate the comprehensive reform, Colombia will update the Multipurpose Cadastre, going from 9.4% in 2022 to 70% in 2026” (DNP, 2023a, p.2).

Contemplating the 5 appendices (or transformations) of the National Development Plan, it is imperative to state that the IGAC plays a crucial role in their fulfillment, since it is the institution responsible for the Multipurpose Cadastre. “This public service is crucial for the transformation of land management and the optimization of land markets, with a focus on equity and the social and ecological functions of property” (IGAC, 2023a, p.3). The IGAC, in addition, develops a transcendental role in the generation of agrological data to promote productive transformation, along with internationalization and climate action in the agricultural sector. “The information produced by IGAC is essential for territorial planning, rural land protection, risk management, ecosystem conservation, and the promotion of environmental justice and inclusive governance” (IGAC, 2023b, p.3).

With regard to guaranteeing the human right to food, it is desirable to seek programs and strategies of territorial scope with a view to eradicating extreme poverty, eliminating hunger in early childhood, and exponentially increasing the production of resources for well-being and life. Regarding the promotion of human security and social justice, projects should be established to “reduce poverty, double Internet access, strengthen higher education for a peaceful society [...], promote the popular economy, reduce the hours of unpaid care, reduce vital deaths, and drastically reduce maternal mortality” (DNP, 2023b, p.1).

Regarding the transformation desired in the field of regional convergence, it is valid to comment that this point emphasizes strengthening initiatives to have a country with tertiary roads to connect the territories. The above, accompanied by more homes with housing, and above all to strengthen logistical capacity, and reduce poverty to achieve high rates of development and welfare (DNP, 2023).

On the transformation in terms of internationalization, productive economy for life and climate action, an energy transition is required, where Colombia must revitalize nature with social inclusion. Instances where deforestation must be halted, an environmentally sustainable transportation system must be developed, exports must be diversified and a reindustrialization program must be carried out in terms of knowledge and technology (DNP, 2023). After having briefly described the five transformations proposed in the National Development Plan 2022-2026, it is necessary to clarify that the axioms or axes presented “represent relevant commitments to guide territorial policy [...], which require

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aligning the institutional postulates of the IGAC to contribute, from its mission, to the Characterization of the Institutional System of the Multipurpose Cadastre, its mission, challenges, and “Geography for Life” (2016-2023) (12337)

Federico Pinzón Arana, Johan Andrés Avendaño Arias and Daniel Estiven González Ríos (Colombia)

fulfillment of the broad agenda of change proposed by the national government” (DNP, 2023c, p.7). Based on the above, it is valid to comment that the IGAC contributes to the current TAS by:

Provide geographic information for the articulation of different government plans and the strengthening of links between territories, with the objective of closing territorial gaps and promoting social and economic development. In addition, the role of the IGAC is fundamental for the strengthening of municipal income sources through the Multipurpose Cadastre that contributes to local development and the provision of goods and services, promoting human security and equitable progress. (IGAC, 2023c, p.3)

After explaining the importance of the IGAC in the implementation of the strategies of the National Development Plan in terms of its five transformation processes or guidelines, it is worth saying that at the present juncture (2022-2026), the entity operates under a policy framework that encompasses a broad melting pot of agents, concepts and scenarios, better known as “Geography for Life” But why a Geography for Life? The IGAC, as the highest geographic authority, assumes the responsibility of placing its efforts to support the consolidation of territorial peace at the service of the nation, the State and citizens (Avendaño, 2023a, p.1). In this sense, and materializing the commitments of the National Development Plan PND 2022-2026 to turn Colombia into a “Power of Life”, this institution urges to reflect on how geographic knowledge contributes to the construction of peace in the country and the welfare of individual (and community) life.

Geography for Life is an “emerging notion, under construction, and surely dynamic that, in principle, starts from a context located in the horizon of the expressions of social conflict and armed conflicts in the Colombian geographic space” (Avendaño, 2023b, p.2). However, today, this notion takes on prospective relevance, of future vision in order to consolidate a perception of territories with a real guarantee of rights and life with dignity. Geography for Life is debated between the; “epistemic discussion on the way to the consolidation of its definition and the relevance of praxis to understand its evidences and expressions in the scenario of social relations and the geographical spaces in which they develop” (Avendaño, 2023c, p.2). Ultimately, it is to think that “the exercises of reflection, analysis, understanding and geographic interpretation must continue to be absolutely relevant, today, concomitantly, it is indispensable to transcend to doing, to transformation, to assume the role of contributing to change” (Avendaño, 2023d, p.2).

Geography for Life also understands, today more than ever, that in addition to addressing “conflicts of the Colombian space-time, it must pay attention to preserving life on the planet, since it is, as in no other historical moment, in a great vulnerability due to the intensification of the impacts of the Anthropocene” (Avendaño, 2023e, p.2). Climate change is undeniable; the effects are imminent and transpiring at multiple scales. This leads to think

~~that Geography for Life should be seen in multi-scale terms, from the global to the local, with~~  
Characterization of the Colombian Territorial Administration System: Multipurpose Cadastre, dimensions, challenges, and “Geography for Life” (2016-2023) (12337)

Federico Pinzón Arana, Johan Andrés Avendaño Arias and Daniel Estiven González Ríos (Colombia)

emphasis on facing challenges that emerge in the geopolitical Cartesian plane, and identifying anomalies and solutions involved in purely national and regional scenarios, “where decentralization, rural, urban preponderance, rural-urban relationship, neighborhood and communal, informal, environmental, border, migrations and transhumance, geo-historical, reflective and applied, prospective, etc. transcend” (Avendaño, 2023f, p.2 ).

Of course, the responsibility assumed by the IGAC with the implementation of a political initiative of Geography for Life, gives account of reflections for the optimal development of a sustainable TAS whose bases are constituted from the good development of multiple projects and sketches such as the; Multipurpose Cadastre, land use planning (around water), valuation processes, real estate (and land) markets, agrological studies (use and coverage), geodesy, risk management, environmental and territorial management, legal security of land tenure among many other areas. At the same time, it includes the perspective of geomatic and remote sensing tools, cartography and its standards, data analytics, etc. (Avendaño, 2023).

#### **4. DIMENSIONS OF THE COLOMBIAN TERRITORIAL ADMINISTRATION SYSTEM: ECONOMIC, ENVIRONMENTAL, AND SOCIOPOLITICAL**

Within the framework of the TAS (traditional and current), 4 dimensions can be distinguished, among which are identified: economic, social, political and environmental. The economic phase emphasizes everything related to the collection of resources for the updating of cadastral information, and the provision of inputs for priority works in the municipalities. In this order of ideas, in the TAS own environment, the Multipurpose Cadastre has played an important role for the economy.

Previously, tax collection in municipalities that did not have updated cadastre information was minimal. The outdated cadastre allowed illegality and tax evasion to be above the national welfare, so public policy sought to establish methodologies that would allow municipalities to participate in the same progress that the country required in cadastral matters. At the head of the IGAC and the municipalities, with the proposal that each territorial entity should have updated information, the Multipurpose Cadastre policy has been implemented, where the municipalities have been called upon to be cadastral managers, to know their territory and to administer it in a timely and complete manner (DNP, 2022).

The problem that has arisen in some municipalities is associated with the economic part, and this is related to the categorization of the municipalities. Not all of them have a large portfolio to support the economic burden required to create and sustain an adequate cadastre, which has led functional municipalities to carry out associative schemes of territorial entities. Field surveys are costly, and in some cases delayed depending on the topography of the municipality, public order, technical and technological capacity, which, in turn, must be state of the art to obtain results that allow benefits to be obtained.

The economic dimension has been framed in the attainment of resources through the cadastre, the update has allowed in these years an increase in the collection of

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Characteristics of the Colombian Territorial Administration System: Multipurpose Cadastre, and “Geography for Life” (2016-2023) (12337)

Federico Pinzón Arana, Johan Andrés Avendaño Arias and Daniel Estiven González Ríos (Colombia)

and that had never been taxed. As of June 30, 2022, according to IGAC figures, “the country reached a cadastral update equivalent to 40.31%, more than 45.9 million hectares” (DNP, 2022, S.p.). For this reason, the need for the interoperability of the cadastre-registry allows finding hundreds of processes that were legally carried out, but that had no information available from the cadastral point of view.

From another angle, it is valid to say that the social component is one of the most important dimensions in the TAS. The citizen is no longer a foreign actor in the administration of the territory, since Colombia has prioritized permanent (citizen) participation in the construction of public policies for the development of territorial management, as well as for the identification of problems and analysis of other dynamics inherent to the territories. While in the past the citizen, when required to carry out a process for any type of transaction, was in a complex situation, now the TAS focuses on the individual, especially to reduce the procedures (and costs) so that the processes are timely. It should be noted that TAS, in its coupling and standardization phase, still has problems in its operating system, since these procedures vary from municipality to municipality, and the municipal autonomy can establish parameters that are not yet taken into account in TAS.

Now, the value chain of the Colombian TAS processes establishes that citizens must participate in the support processes. The interest of a landowner in his property means that he requires information that the State, as the party responsible for the administration of the territory, must provide. Therefore, the information must be interoperable; processes must be developed to implement mechanisms that allow the dissemination and consultation of territorial information, which contributes to the development of the communities, allowing decision making on a specific territory. The processes of citizen participation are part of the TAS mission development; the Multipurpose Cadastre has made it possible to establish relationships between citizens and their property, but the TAS is responsible for integrating rights, responsibilities and restrictions (Rodríguez-Ospino, 2020).

On the other hand, the political dimension has been framed in the development of government plans with respect to Multipurpose Cadastre policies and TAS governance. In this sense, it is worth highlighting that there is a great political interest in territorial management, the lines of work focused on strengthening territorial information systems have allowed the country to advance in terms of governance and achievement of objectives, the design and structuring of policies that allow recording, analyzing and sharing territorial information generate confidence in the citizens.

The public policies that stood out the most between 2016 and 2023 were the CONPES documents that conceptually, established a general vision of the Multipurpose Cadastre, its financing and the governance of the TAS. Moving from public function to a public service of cadastral management with multipurpose scope. To make its implementation possible, the DNP contributed to the preparation of regulatory, institutional and technological advances. Proof of this is the same National Development Plan (PND) (2018-2022) “Pact for Colombia. Pact for Equity”, which included necessary elements for

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the implementation of the Multipurpose Cadastre policy providing for cadastral management, and “Geography for Life” (2016-2023) (12337)

Federico Pinzón Arana, Johan Andrés Avendaño Arias and Daniel Estiven González Ríos (Colombia)

as a public service; and CONPES 3859 (2016), 3951 (2018)<sup>11</sup>, 3958 (2019)<sup>12</sup> and 4007 (2020), which established resources and guidelines to promote this same initiative and set the strategy for strengthening governance in the TAS.

The environmental dimension of the TAS calls for the incorporation of actors producing information on the territory with reference to the environment and natural resources. This commitment links entities such as the Regional Autonomous Corporations<sup>13</sup> and National Natural Parks<sup>14</sup>, which are producers of environmentally relevant information. The help provided by territorial information to manage, care for, protect, plan and promote projects focused on environmental care has made it possible to establish “green” public policies for the preservation of ecosystems with sustainable development.

In this sense, knowledge of the territory is indispensable for risk and natural disaster management, and regional entities that produce independent information, such as risk management units, have been called upon to participate in the interoperability of information. This environment has allowed advances in risk mitigation to be implemented in other municipalities that did not have sufficient risk management administration.

## **5. CURRENT CHALLENGES OF THE TERRITORIAL ADMINISTRATION SYSTEM (2016-2023)**

In the first place, one of the main challenges that have long afflicted the implementation of the TAS in Colombia is changes of government. Key initiatives for the proper development of the TAS, such as the Multipurpose Cadastre and guidelines associated with territorial governance, require that the governments in office establish policies that guarantee their continuity and consolidation. Where changes in government administration do not have a negative influence, since these policies must be promoted in each government, given that they are of general interest, and the political will to continue with certain projects fosters, in society, a greater perception of trust in the leaders (DNP, 2020).

In the framework of the TAS, between 2010 and 2018, Juan M. Santos, prioritized in the PND (2014-2018), the need to consolidate a territorial management system, for the proper administration of the territory, an idea that was accelerated and strengthened with the signing of the Peace Agreement. Subsequently, with the PND (2018-2022) “Pact for Colombia, Pact for Equity”, Iván Duque, gave continuity to aspects such as the generation of public policies for the TAS improvement, the financing of the Multipurpose Cadastre and the

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<sup>11</sup> CONPES Document 3951 "Favorable concept for the nation to contract external credit operations with the Multilateral Bank for up to USD 150 million, or its equivalent in other currencies, destined to partially finance the program for the adoption and implementation of a Rural-Urban Multipurpose Cadastre (DNP, 2018).

<sup>12</sup> CONPES Document 3958 "Strategy for the implementation of the Multipurpose Cadastre Public Policy" (DNP, 2019).

<sup>13</sup> Public corporate entities, created by law, integrated by territorial entities that due to their characteristics geographically constitute the same ecosystem or form a geopolitical, biogeographical or hydrogeographical unit, endowed with administrative and financial autonomy, their own assets and legal personality, entrusted by law to manage, within the area of their jurisdiction, the environment and renewable natural resources and to promote their sustainable development (Minambiente, 2023).

<sup>14</sup> The entity is in charge of the administration and management of the National Natural Parks System and the coordination of the National System of Protected Areas (ANM, 2023, par. 2). Characterization of the Colombian Territorial Administration System: Multipurpose Cadastre, dimensions, challenges, and “Geography for Life” (2016-2023) (12337)

regulations to carry out cadastral processes in a timely manner from the perspective of interoperability, the above was presented in the “Pact for Decentralization” section of his PND, where he sought to constitute a triad that would integrate territories, governments and populations, in a single functional scheme.

Currently, the government of Gustavo Petro seeks to implement numerous strategies and programs, with a view to strengthening the Multipurpose Cadastre for the proper consolidation of the TAS. Institutions such as the IGAC play a leading role in the complete consolidation of the TAS in Colombia, where, in the four-year period (2022-2026), the goal is to achieve cadastral coverage of 74.4% of the national territory, which is equivalent to 598 municipalities representing an area of 84,844,235 hectares (IGAC, 2023). Despite the fact that recent governments have made every effort to manage a series of projects and programs aligned to adequately promote the establishment of an effective TAS, administrative changes affect any strategy to be implemented. Aspects such as the budget allocated for its proper implementation, together with other approaches for its execution, are susceptible to modifications depending on the political approach taken.

Secondly, it is essential to point out that, from its inception to the present day, the TAS has had to adapt to numerous changes. Consequently, the professionals involved in the operation of the TAS have made multiple adjustments to the methodologies that, historically, were used for the development of cadastral processes and obtaining special information. Such adjustments have been made due to changes in regulations and standards that have been made on the fly, due to the needs of the administration of the territories, capacities and characteristics of cadastral management.

Therefore, one of the challenges that emerge in the current TAS framework is the adaptation to regulatory and methodological changes, since it is not easy to adapt to them, and usually, officials require extensive and demanding training, where entities must also modify their systems, processes, etc., and even invest in new equipment and other technical resources. From another perspective, in the territorial approach, new goals are also established where more actors participate, which must be coupled to a context of interoperability in a modern TAS.

Between 2016 and 2023, there have been several exchanges in terms of the application and insertion of new standards and methodologies for the implementation of cadastral processes. Regarding the above, it is necessary to clarify that the application of models, such as the LADM-COL and other technical initiatives such as the LADM-POT<sup>15</sup> Model, establish these changes in regulatory standards, where the TAS has had to redesign itself and adjust to the needs of recent methods. At first, the challenge was to standardize the “cadastre-registry” information with the implementation of the LADM-COL model, establishing technical parameters for the transfer of information. More recently, the LADM-

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<sup>15</sup> Extended model, to model information related to the country's POTs, with the purpose of standardizing spatial objects, categories and domains for the exchange of data between the different territorial levels compatible with the property model  
Characterization of the Colombian Territorial Administration System: Multipurpose Cadastre, dimensions, challenges, and “Geography for Life” (2016-2023) (12337)

POT model has been developed, which involves the interoperability of the POTs and the Multipurpose Cadastre (Correa-Borrero, 2022).

Thirdly, another impediment to the implementation of the TAS is related to the shortage of trained personnel, from the academic-technical point of view, for the execution of cadastral tasks. Within the scope of this challenge, it is decisive to state that, among the subparagraphs of CONPES 3859 there is a statement that refers to the shortage of qualified professional resources (2016a, p.28). Verse in which it is clarified that, “Colombia does not have a registry of certified professionals who can perform cadastral activities, despite the fact that it is currently possible to identify several professional profiles that, complemented, could perform the processes [...]” (DNP, 2016b, p.28). Particularly, Colombia has lacked collaborators and operators specialized in the subjects of remote sensing, geodetic systems, cadastral valuation, geomatics, administration of geographic and geospatial information systems.

In the same sense, the challenge for those responsible for the implementation of the TAS has been the training of professionals in the areas of cadastral engineering and geodesy, topography, geography, agronomy, etc. Given that, by 2023, it is recognized that, if there are suitable academic profiles, but the permanent regulatory change requires multiple trainings in the use of innovative methodologies and the use of Information and Communication Technologies (better known as TICs) to be implemented for the optimal development of the TAS and the Multipurpose Cadastre. Professionals in the areas in question possess solid theoretical-practical bases and it is necessary to deepen, in specifically technical issues associated with the creation and subsequent implementation of the LADM-COL Model, and the appropriate application and insertion of international standards for territorial administration (Stuedler, 2018).

Therefore, it is essential and peremptory that, from the Colombian academy, the offer of courses be expanded with a view to refine and strengthens the technical skills and abilities of professionals in the aforementioned areas. In fact, agencies and institutions such as the IGAC, the *Servicio Nacional de Aprendizaje (SENA)*<sup>16</sup> and Swiss Tierras Colombia<sup>17</sup> have offered various training programs to learn about the regulatory framework of the Multipurpose Cadastre, along with training for land survey, and other sessions to understand the preponderance of the role played by the TAS (and the cadastre) in territorial governance. From an academic point of view, entities such as the *Universidad Distrital Francisco José de Caldas (UDFJC)*, the *Universidad Pedagógica y Tecnológica de Colombia (UPTC)*, the *Universidad Militar Nueva Granada (UMNG)*, among others, offer accredited undergraduate (for the UDFJC) and graduate programs, where their curricula

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<sup>16</sup> Responsible for fulfilling the State's duty to invest in the social and technical development of Colombian workers, offering and carrying out comprehensive vocational training for the incorporation and development of people in productive activities that contribute to the social, economic and technological development of the country (Law 119/1994) (SENA, 2023).

<sup>17</sup> The SwissTierras Colombia project, financed by the Government of Switzerland, is supporting the definition of public policy through the design of the SAT, which includes the standardization of data for interoperability and availability of information, support to territorial entities to decentralize land management, especially the Multipurpose Cadastre, as well as training courses for the Multipurpose Cadastre, dimensions, challenges, and “Geography for Life” (2016-2023) (12337)

include courses in cadastre, geodesy, geomatics, planning, land management, topography, among others. The academic projects and schemes offered today by institutions committed to the training of professionals involve multiple technologies for territorial analysis.

The IGAC recommends that engineers and other professionals specialize in advanced topics that are currently of vital importance for the implementation of the TAS, such as data science, Artificial Intelligence (AI), programming, management of Geographic Information Systems (GISs)<sup>18</sup>, and the use of cartographic geo-technologies. The above, without losing sight of the theoretical and practical importance of other areas of study such as traditional geography, statistics (probability), cartography, etc. (IGAC, 2023). In spite of the obstacles that emerge in contemporary times, it is key to comment that the problems of the traditional structure not only persist, but have also worsened and fostered a social phenomenon, which is framed in the armed conflict that still persists. Land administration has not been effective and does not guarantee security and legal tenure. The inequitable and disproportionate distribution of land has meant that land ownership is concentrated in the hands of a minority.

Likewise, the responsibility to manage land, has been a function of the governments in office, this makes land management become a political issue, and does not meet the needs of citizens, which generates distrust about the legitimacy of property rights (Machado, 2017). This problem is present in every government, where the search for solutions has not been a priority. It was until the Peace Agreement, where the issue of land and comprehensive rural reform came to the fore.

Up to that point, land administration was not a very visible issue, with a framing of the physical and economic dimensions of land as a productive asset, without the necessary transcendence and scope. The needs and dynamics that arose in Colombia in the economic, social, environmental and political dimensions, led the government in 2016 to seek solutions that would make the TAS functional again, with an updated approach, associated with dynamics present in the territories. In this sense, the territorial approach of the Peace Agreement;

It involves recognizing and taking into account the needs, characteristics and economic, cultural and social particularities of territories and communities, guaranteeing socio-environmental sustainability; and seeking to implement measures in a comprehensive and coordinated manner, with the active participation of citizens. The implementation would be done from the regions and territories and with the

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<sup>18</sup> It allows to relate any type of data with a geographic location. This means that on a single map the system shows the distribution of resources, buildings, populations, among other data of municipalities, departments, regions or an entire country. GIS are designed to capture, store, manipulate, analyze and display information in all possible ways in a logical and coordinated manner. (Machado, 2017, p. 203)

Characterization of the Colombian Territorial Administration System: Multipurpose Cadastre, dimensions, challenges, and “Geography for Life” (2016-2023) (12337)



participation of the territorial authorities and the different sectors of society.  
(Cancillería, 2016, p.13)

## 6. CONCLUSIONS AND RESULTS

With the intention of making a detailed characterization of the TAS in Colombia (2016-2023) and responding to the research question of: What are the essential characteristics of the Territorial Administration System (TAS) in a contemporary Colombian socio-political scenario (2016-2023), where the Multipurpose Cadastre prevails in the framework of “Geography for Life”? It is essential, to clarify that, the coexistence of pre-existing forms of land administration and territorial administration, have allowed establishing a contemporary discussion in the framework of sustainable development and governance, where the territorial approach encompasses a broader vision than that of the land container approach. Integrating territorial elements that also belong to the country, allow the generation of an environment where territorial information converges, where decisions are made based on territorial data, reducing the margin of error that compromises governance (González, 2022).

Land must be administered, taking into account the characteristics of the territory, and above all, its economic, social, political and environmental dimensions. Likewise, the activities around the TAS have allowed, through the cadastral update, the incorporation of new properties to the TAS, reflecting the increase in the taxation of the municipalities. The social dimension is framed within the search for solutions to the problems that citizens have when carrying out any procedure. In this sense, procedures have been minimized, using interoperable information systems, where requirements and times are reduced, in addition to making the citizen a participating actor in the updating and correction of the information of his property, and allowing him to express inconveniences that arise in the municipalities.

Also, the Multipurpose Cadastre has been transformed into a public service (free of charge) regulated by the State, which stands out for being a “complete environment of institutions, laws and processes, where citizens request procedures, permits, licenses; related to the territory and the institutions that make decisions to promote development” (Albarracín, 2022a, p.23). The political dimension has been characterized as an environment in which various public policies are implemented, which make the TAS and the Multipurpose Cadastre interoperable, and the information has the same semantics for the actors involved.

Government plans seek to ensure that policies in the area of TAS are sustainable and that territorial management processes are optimized. In the environmental dimension, a call has been made to involve those institutions that produce and analyze territorial information with perspectives associated with sustainable development and climate change. Multiple entities, such as the Regional Autonomous Corporations and the Natural National

Parks have standardized their information through the Colombian Spatial Data Infrastructure (better known as ICDE)<sup>19</sup> (ICDE, 2022).

The most relevant emerging challenges for implementing the TAS are manifested in three scenarios: changes in government, academic training of personnel and adaptation to different regulatory frameworks. In order to overcome government changes, public policies must not have a programmed obsolescence (of a government period). On the contrary, they should be long-lasting and should be included in the NDP of each government, and should function as State policies to strengthen governance and effective administration of the territory (González, 2022).

The implementation of improvement processes in the academic training of personnel involved in technical and technological processes is one of the great challenges that emerge within the framework of the TAS. Although professionals have solid knowledge in the subjects of cadastre, geodesy, planning, etc., it is necessary that the technical training for the territorial approach be comprehensive. In addition to increasing the number of professionals in the area, it is necessary, for the successful evolution of the TAS, to adapt to regulatory changes.

Changes, in order to fine-tune processes, have been made on the fly, and the ability to adapt to certain changes has allowed the TAS to constantly improve. The information standards and the incorporation to the ICDE have allowed the information and data to be of higher quality, so that the information can be used to make decisions about the territory. At the same time, it should be noted that “a formally established TAS with robust governance allows interactions and constant feedback from the generation of information and the interoperability of information systems” (Albarraacín, 2022b, p.28).

The standardization of information has been considerably the first step towards interoperability, given that the production of territorial information was disconnected, and each entity produced its own information, which generated multiple versions of the same territorial object. Therefore, the Multipurpose Cadastre and other initiatives are part of the digital transformation of the State. The Multipurpose Cadastre for the role it plays in the TAS, has made its first steps to establish parameters with the land registry, this was until 2020, which jointly sought to involve other producers of territorial information, but try to integrate 2 territorial information systems (Gonzalez, 2022).

Given that the traditional Colombian cadastre had high rates of out datedness, which has generated new lines of action to close the information gap. The administration of the Colombian territory is the responsibility of the State, and it must promote a favorable scenario for the processes to work in a synergic manner. Public policies have allowed the TAS to be formed with special characteristics; from planning and the future vision of a system that integrates interoperable territorial information programs that promote efficiency in governance. It should be noted that the peace process "opens the doors" to consider the

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<sup>19</sup> Set of technologies, standards, policies, plans and institutional projects that facilitate the generation, availability and Characterization of the Colombian Territorial Administration System: Multipurpose Cadastre, dimensions, challenges, and “Geography for Life” (2016-2023) (12337)

cadastre with a multipurpose approach, as a macro project, whose pilot programs and plans allow establishing the basis for future requirements of the TAS operation. With the PND (2018 - 2022), Multipurpose Cadastre policies are promoted for the TAS. It is up to this point, the analysis that is made from the perspectives of administering land or administering the territory, when it must be defined that Colombia administers land from a general scope that is; the administration of the territory, the bet of governance is to effectively administer the territory to plan and establish policies that allow the sustainable development of the country (González, 2022).

Now, within the framework of the National Development Plan (2022-2026), there is an approach that seeks that middle point where people converge or interrelate with the territory itself, where this second concept plays the role of a primordial concept for a nation (or country) to reach standards of well-being and sustainable development, where there are decent living conditions with a component of social justice. Taking the National Development Plan 2022-2026 as a reference point, it is imperative to state that the management of the current TAS is directly linked to the axioms or transformations of: “territorial planning around water, the human right to food, productive transformation, internationalization and climate action, and regional convergence; and indirectly, in the consolidation of enabling conditions for human security and social justice” (IGAC, 2023h, p.7).

Considering the current environment, entities such as the IGAC emerge as leading and key institutions in terms of the construction, development and maintenance of a TAS, whose deployment and implementation must be carried out taking into account aspects such as “peace building”, sustainable development and socioeconomic well-being. Likewise, any initiative implemented with a view to strengthening, consolidating or improving the execution of the TAS must be associated with programs to promote and strengthen territorial planning, the implementation of geographic chairs, and, of course, the activation of the Multipurpose Cadastre that marks a line of transit (effective and logical) towards the optimal transformation of the TAS (Figure No.2). At the end of the day, the TAS in Colombia represents:

[An] integrating benefit of the main transformation efforts [...], it seeks to strengthen the governance of the territory, so that the State, civil society organizations, private

companies and, in general, the citizenry, interact, cooperate harmoniously and coordinate in making decisions about the territory. (Albarracín, 2022c, p.28).

**Figure No.2: Articulation of the PND 2022-2026 with IGAC.**

Ley 2294 de 2023	
Tema	Artículos
<b>Ordenamiento Territorial</b>	Art. 32. Determinantes de ordenamiento territorial y su orden de prevalencia
<b>Catastro Multipropósito y tránsito hacia el sistema de Administración del Territorio SAT</b>	Art. 43. Naturaleza y organización de la gestión catastral (modifica Art 79 de a Ley 1955 de 2019)
	Art. 45. Gestión catastral en territorios y territorialidades de comunidades indígenas y en territorios colectivos de comunidades negras, afrocolombianas, raizales y palenqueras
	Art. 46. Adecuación institucional de la política de catastro
	Art. 47. Aspectos regulatorios del servicio público de la gestión catastral
	Art. 48. Ejecución de recursos para la gestión catastral
	Art. 49. Reducción de rezago de avalúos catastrales a nivel nacional mediante actualización masiva de los valores rezagados
	Art. 50. Gestión catastral a cargo de la Agencia Nacional de Tierras (Modifica el Art. 80 de la Ley 1955 de 2019)
	Art. 51. Sistema Nacional de Reforma Agraria y Desarrollo Rural (modifica el Art. 2 de la Ley 160 de 1994)
	Art. 52. Conformación del Sistema Nacional de Reforma Agraria y Desarrollo Rural (modifica el Art. 4 de la Ley 160 de 1994)
	Art. 53. Formalización del SAT
Art. 54. Salvaguarda del registro de la propiedad inmobiliaria del país	
<b>Cátedra de geografía</b>	Art. 121. Promoción de las cátedras obligatorias en historia, geografía, educación física en la etapa básica y media

**Source: IGAC (2023).**

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