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ARTICULATION OF THEORY AND PRACTICE ON URBAN RESILIENCE AND ADEQUATE SOCIAL HOUSING. POPAYAN-COLOMBIA

ARTICULACIÓN DE TEORÍA Y PRÁCTICA SOBRE RESILIENCIA URBANA Y VIVIENDA SOCIAL ADECUADA. POPAYÁN-COLOMBIA

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ABSTRACT

As a result of the investigative process carried out in Popayán, it is concluded that Urban Resilience, it is the capacity and ability of an urban system to maintain its functionality in the face of impacts or catastrophes of natural or anthropic origin, being a continuous and dynamic process implemented in the public, private and community sectors, whose objective is to anticipate events that modify social, economic factors , physical, environmental and cultural of a city, with a look that promotes the return to normality and the improvement of the existing conditions before the occurrence of the event. On the other hand, considering Adequate Social Housing, as a basic need of every human being, construction immersed in an urban environment affected by various territorial, structural, social or organizational vulnerabilities, an articulation is proposed between the theory on Urban Resilience and Adequate Housing promoted by the United Nations Organization, its inclusion and applicability in processes of design, improvement and approval of these projects in the city of Popayán - Colombia. The resulting analyzes show a low inclusion of Urban Resilience in the regulations on social housing at the national and local level, reflected in the importance given to financing and provisions to make it affordable to the population, with medium inclusion at the academic level and low at the professional level. Also indicating the need to generate and implement territorial strategies of a political-administrative nature, in the long term, that involve these concepts in the development of Social Interest Housing at the urban level.

Palabras clave:

RESUMEN

Como resultado del proceso investigativo realizado en Popayán, el concepto de Resiliencia Urbana define como la capacidad y habilidad de

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vivienda adecuada, resiliencia urbana, teoría y práctica, arquitectura	un sistema urbano de mantener su funcionalidad ante impactos o catástrofes de origen natural o antrópico, siendo un proceso continuo y dinámico implementado en el sector público, privado y comunitario, cuyo objetivo es anticipar eventos que modifiquen factores sociales, económicos, físicos, ambientales y culturales de una ciudad, con una mirada que propicie el retorno a la normalidad y el mejoramiento de las condiciones existentes antes de la ocurrencia del evento. Por otra parte considerando la Vivienda Social Adecuada, como una necesidad básica de todo ser humano, construcción inmersa en un entorno urbano afectado por diversas vulnerabilidades de carácter territorial, estructural, social u organizacional, se propone una articulación entre la teoría sobre Resiliencia Urbana y la Vivienda Adecuada que promueve la Organización de las Naciones Unidas, su inclusión y aplicabilidad en procesos de diseño, mejoramiento y aprobación de estos proyectos en la ciudad de Popayán-Colombia. Los análisis resultantes demuestran una baja inclusión de la Resiliencia Urbana en la normatividad sobre vivienda social a nivel nacional y local, reflejada en la importancia dada a la financiación y disposiciones para que sea asequible a la población, con mediana inclusión a nivel académico y baja a nivel profesional. Indicando además la necesidad de generación e implementación de estrategias territoriales de carácter político administrativo, a largo plazo, que involucren estos conceptos en el desarrollo de la Vivienda de Interés Social a nivel urbano.

Introduction

Currently, one of the main challenges in the development of sustainable cities at international, national and local levels is the interdisciplinary development of political, economic, environmental, social and cultural aspects (Gómez, et al., 2020). Consequently, city decision-makers must integrate elements of the Sustainable Development Goals (SDGs) such as environmental regeneration, responsible consumption, environmental assessments, environmental education, among others, in order to achieve optimal development in the quality of life of their inhabitants.

The concept of sustainable city has been reinforced with the publication of the 2030 Agenda and the Sustainable Development Goals mainly Goal 11 on making cities and human settlements inclusive, safe, resilient and sustainable (United Nations, 2018). Specifically, with respect to Urban Resilience, the HABITAT III Cities Program (2015), contributes to the objectives of the New Urban Agenda to improve understanding of the causes of urban resilience, enable a city system to withstand and recover quickly from multiple and varied shocks and stresses and improve its performance over time. Due to the above, the interaction between the needs of citizens and natural or anthropic phenomena that could generate an imbalance in their daily activities is an issue that needs to be updated, mainly in the area of Adequate Social Housing. In order to present a diagnosis of the current situation of Urban Resilience in a case study and subsequently propose strategies that integrate factors that benefit the quality of human life, this research focuses on the city of Popayán, located in southern Colombia.

The architectural, urban, environmental, social, economic, political and cultural characteristics that currently govern the city of Popayán indicate the existing vulnerability to natural hazards such as earthquakes (Earthquake of March 31, 1983, which destroyed 40% of the historic sector of the city and caused more than 200 deaths), landslides and floods (Rio Molino - December 2013), and anthropogenic hazards (demonstrations, forest fires, citizen insecurity, vehicle accidents, etc.), added to the repercussions generated by the Covid-19 pandemic in 2020. The above justifies the origin of this study, focused on a proposal on the articulation of Urban Resilience and the development of Social Housing, added among other aspects by what is expressed in the Development Plan I believe in Popayán 2020 - 2023, where it is expressed that: "The housing deficit in the municipality of Popayán has contributed to increase the gap of injustice and inequity in our territory at the urban and rural level, that is why it is necessary an articulated and specialized response by public and private institutions, which allows to adequately invest the available capital, and manage new resources to attend in a prioritized way to the most vulnerable population groups reducing the housing deficit in Popayán that corresponds to the number of housing units that are needed to supply the number of existing households"(p. 96).

For this reason, the research focused on this problem, defining that Social Interest Housing (VIS) represents a fundamental role in the eradication of urban poverty, since it constitutes a right contained in the Universal Declaration of Human Rights, where the United Nations Organization - UNO, states that housing must be "decent and adequate": that is, it must allow the individual to achieve an acceptable standard of living. Starting from the SDGs (goal 11) and highlighting the work agendas and development plans of every city and every country, as expressed in the United Nations New Urban Agenda (2018): Promote housing policies at the national, subnational and local levels that support the progressive realization of the right to adequate housing for all as an integral element of the right to an adequate standard of living, that combat all forms of discrimination and

violence and prevent arbitrary forced evictions, and that focus on the needs of the homeless, people in vulnerable situations, low-income groups and persons with disabilities, while enabling the participation and collaboration of communities and relevant stakeholders in the planning and implementation of such policies, including by supporting the social production of habitat, in accordance with national legislation and standards (p. 14).

On the other hand, this paper relates housing to Resilience in cities by looking for: "Strengthen the resilience of cities and human settlements, in particular through quality spatial planning and infrastructure development." This theme is complemented and strengthened in this same document, when it states that it seeks to promote "the development of resilient and resource-efficient infrastructure and we will reduce the risks and effects of disasters, including through the rehabilitation and upgrading of slums and informal settlements", as well as "We will also promote, in coordination with local authorities and stakeholders, measures for the strengthening and adaptation of all housing at risk, particularly in slums and informal settlements, in order to make them resilient to disasters".

In accordance with the above and considering regulations and referents at the international level, such as that established by the United Nations ECLAC (2016) in Agenda 2030, Goal 11 about inclusive, safe, resilient and sustainable cities; the approach to planning and implementation of resilient cities, according to the United Nations Office for Disaster Risk Reduction (2017) and Habitat for Humanity - 5th Housing and Habitat Forum: Challenges in housing and settlements in the face of climate change and social crisis (2023), the research developed and named: Articulation of theory and practice on Urban Resilience and Disaster Risk Management, based on cause-effect analysis. The study of urban social housing in Popayán-Colombia, shows the relationship between the high disarticulation between the theory of disaster risk management and the public policy of social housing applied in Popayán. The above, aimed at legislative and political personnel, professionals, teachers and students of Architecture and Civil Engineering as the main actors involved in the design and approval processes of social housing projects. It is important to mention that, in order to achieve an integration between the normative, structural and social aspects of resilient cities, it is necessary to generate an interdisciplinary work, therefore, this work was carried out under the perspective of teachers and students of architecture and civil engineering, leaving to the future the integration of other disciplines to propose strategic plans to achieve timely urban resilience.

In the first instance, on the concept of resilience, whose Latin origin *Resilio* means to go back, there are multiple studies, initially focused on the psychosocial area, developed by Luthar (1993), Michael Rutter (1991) and Edith Grotberg (1995) in a first generation. Later Luthar and Cushing (1999), Mastern (1999), Kaplan (1999) and Bernard (1999) in a second generation, understand resilience as "A dynamic process where the influences of the environment and the individual interact in a reciprocal relationship that allows the person to adapt despite adversity" (p.34). A concept that, by expanding into other fields of knowledge, such as economics, anthropology, urban planning and the environment, has now become a very common term in public policies related to the effects of climate change, urban planning and Disaster Risk Management.

As stated by Silva (2010), international cooperation agencies currently consider it as an axis of strategies or policies aimed at mitigating the negative effects of climate change, environmental sustainability and poverty; therefore, resilience becomes the essential human explanatory component of environmental sustainability in the management and habitation of the territory.

According to Melillo (cited in Gauto, 2007, p.243) "the appearance or not of resilience in subjects depends on the interaction of the person and his/her human environment", similar to the definition of Resilience established by Community & Regional Resilience Institute (2013) when recommending that "Resilience should be defined in a way that allows making useful predictions about the capacity of a community to recover from adversity. This will allow communities to assess their resilience and take steps to improve it if necessary."

Concepts applicable to the research conducted in Popayán, where the housing deficit and the precarious conditions of the population are evident, generating high levels of insecurity and poverty at the urban level, in the face of risks due to natural hazards (earthquakes, floods and landslides) and anthropogenic hazards such as crime, with the need to strengthen resilience, defined for this study as the capacity and ability of a community to anticipate events that may generate material and human losses, as well as its adaptation to the adversities that may arise in its environment.

Now, when analyzing the concept of *Urban Resilience* fundamental element of the present research, Ultramari & Denis as cited in Mallqui (2013), define it as:

> The capacity of urban systems - or better yet their managers - to anticipate events that will affect urban dynamics; and how the implications of certain economic, social or cultural factors of such dynamics will transfer to the city elements that will allow it to respond to the adversities that may arise in the process of urban management (p.2).

And according to HABITAT III (2016) United Nations Conference on Housing and Sustainable Urban Development: "Resilience is a quality of sustainable urban development and at the level of a city it recognizes the urban area as a complex and dynamic system that must continuously adapt to various challenges in an integrated and holistic manner" (p.1).

When analyzing the articulation of urban resilience with VIS, it is important to quote Leal del Castillo (2004):

> The notion of housing goes far beyond the physical dimension and is projected onto multilateral aspects of the development of the people who live there. It is at this moment, when the difference becomes explicit, it is there when extrapolating, no longer the material dimensions, but those that arise as a result of the process of inhabiting, the complex universe of dynamics that reflect the system of spatio-temporal relations becomes evident, which within the framework of habitat are no longer limited to the physical-spatial dimension, but also transcend to the socio-anthropological and the environmental-natural (p.38).

In the sense of the socio-anthropological and natural environmental dimensions referred to by Leal del Castillo, Popayán, despite having been a city of relevance in the history of Colombia, since the process of emancipation in the Colonial period, then in the Republican period, being rebuilt by the effects caused by several earthquakes, the last of which, occurred on March 31, 1983 generated until now a complex social situation as expressed by Vargas (2011):

> "Faced with the impossibility of fully complying with the urban and housing solutions proposed in the aforementioned reconstruction and development plan and of physically controlling the entire reconstruction process, illegal groupings on the outskirts of Popayán overflowed the city limits constituting large marginal sectors that, over time, have developed in some areas considered high risk and vulnerability, increasing the risk at the urban level that already existed before the last earthquake."

This situation is reflected in the Comprehensive Diagnosis of the Land Use Plan-POT of Popayán (2015), due to the phenomenon of both population growth and subnormal settlements, causing a serious problem by not considering the condition of poverty and situation of marginalization in vulnerable communities.

In conclusion, from the research conducted, in the urban area of Popayán, it is required to strengthen Urban Resilience, considered as expressed by Leal de Castillo, not only from the physical dimension, but also from the habitat process, from the socio-anthropological and natural environment, taking into account that every VIS project should be multidisciplinary with contributions from architects, civil engineers, ecologists, lawyers, economists, among others, so that there is an integral relationship of resilience with its habitat from a human vision and the satisfaction of the needs of the community for which the housing is projected.

Background on the generation of Urban Resilience in Social Housing

By examining references such as: Barcelona walking towards Urban Resilience in the Vallcarca Neighborhood by Rafael De Balanzo Joue (2014); The Inclusive, Resilient and Sustainable Cities of the Latin American Urban Agenda by Gustavo Pandiella (2016); The study of resilience in natural disasters in six neighborhoods of the city of La Paz, Bolivia by Luis A. Salamanca (2009); Resilient Medellin - A strategy for the future by the Rockefeller Foundation, Mayor's Office of Medellin (2017) and the Guide to Urban Resilience Government of the Republic of Mexico (2016), the following were defined as the basis for solutions, taking into account the actors referred to in the research hypothesis : professionals, teachers and students of Architecture and Civil Engineering, involved in the processes of design, approval and construction of VIS projects, under the experience in academic, institutional spaces and professional practice:

a) Urban Resilience in Latin America. A brief guide for local authorities, which concretely studies housing conditions in the face of resilience by Fundación Idea (2017) a pioneering public policy think tank in Mexico and Colombia, where it defines that resilience "is not just a policy or a program: it is the integration of a set of capacities and resources". Further ensuring that, as of the date of that publication in 2017, a key urban system such as housing is excluded from the resilience discussion.

This guide sets out some challenges for integrating the conceptual framework of resilience into urban planning, as follows: Challenge A: Resilience must be local, with key components such as social housing, generally overshadowed by policies focused on climate change. Challenge B: Resilience recognizes risks. Challenge C: Resilience requires participation because there is a lack of accountability and effective mechanisms for citizen participation. Challenge D: Resilience meets resistance. Challenge E: Resilience is not obtained immediately: its interventions are long-term. Challenge F: Resilience is complex: the lack of capacity of local institutions continues to be a major obstacle, hence the need to find points of interception and generate continuous learning.

It is important, therefore, to understand that *Urban Resilience* is not just a policy or a program. Consequently, the articulation between the political and social actors that in one way or another are part of the process and in the case of the research conducted in Popayán, the professionals involved in the design, approval and construction of the VIS, so that its projection and materialization also meet the requirements for it to be considered as Adequate Housing. However, a guideline is required, a starting point (policy, strategy, plan and/or program) that guides the development of the project to be executed and provides the opportunity to manage economic resources for its implementation.

b) Habitat III themes. 15 - Urban Resilience. Secondly, the objective of this publication is to contribute to building resilience by including three pillars of the New Urban Agenda, namely: Urban Planning; Urban Legislation and Municipal Financing, through key drivers for action described as follows (p.7):

- Leveraging the city's planning instruments to reduce existing risk and prevent the creation of new risks while reducing exposure to hazard from uncontrollable but predictable conditions of climate irregularities and disaster risk, in particular by strengthening technical and scientific capacity to capitalize and consolidate existing knowledge; building the knowledge of government officials at all levels, civil society, communities and volunteers, as well as the private sector, through sharing experiences, lessons learned, good practices, and training and education.
- Develop or enhance existing policies (including national policies at the city level) that promote compact, socially inclusive, more integrated and connected cities that foster sustainable urban development.
- Develop mechanisms / tools to promote coherence between systems, sectors and organizations related to their policies, plans, programs, processes and investments in urban resilience.

Under these drivers, the research conducted in Popayán includes the concepts of *Urban Resilience* and *Adequate Housing* applied to urban planning and legislation, from the experience of professionals, teachers and students of Architecture and Civil Engineering, involved in the design and approval processes of VIS projects:

a) Principles for climate change resilient social housing design. Rolando Arturo Cubillos González, defines *resilient social housing* as a housing model characterized by minimizing future risks from natural events and that is simpler and faster to rebuild or repair in its physical dimension and describes four design principles of Resilient Social Housing: Housing must be flexible, energy efficient, livable and affordable, emphasizing that incorporating the concept of resilience in social housing will surely require a transdisciplinary sustainability science. In addition to the incorporation of integrative design processes focused on urban systems and participation in the formulation of resilience-oriented housing policies (p.20).

Therefore, it is essential to articulate all these aspects (social, political, public and ecological) with the regulations applicable to theVIS, in environments susceptible to the generation of physical, social, environmental and economic vulnerability, such as the urban area of Popayán, which presents natural and socio-cultural hazards, defined among others by the Comprehensive Diagnosis of the Ordinance Plan (2015) and the Popayán Development Plan (2020-2023), documents where the prospective or anticipated vision of disaster risk is not incorporated.

Hence, from the research developed, it is necessary to incorporate the policy implementation process of Van Meter, D.S., and Van Horn, C. (1993), by establishing a policy implementation system that includes feedback from the system environment, made up of: demands and resources, the transformation process, the policy and the results:

"Four additional factors are included in our model: communication between organizations and induction activities, the characteristics of the agencies responsible for implementation, the influence of the economic, social, and political environment on the jurisdiction or organization where implementation takes place, and the disposition of those in charge of implementation" (p. 122).

The above with the objective that the implementation of policies that incorporate the theory on Urban Resilience and Adequate Housing generate "Compliance", another concept discussed by Van Meter and Van Horn (1993), related to obedience or disobedience to a law or directive and includes manipulation, rewards and symbolic deprivations with remunerative power.

Aspects applicable in the case of the VIS in Popayán and the research conducted, which concludes that the VIS should focus on the real needs of a family, of a community, where the quality of life prevails, not the quantity of housing solutions, with flexible, habitable, safe spaces, with public and complementary services that contribute to the generation of *Urban Resilience* through production chains, productive capacity and quality of community life, where the implementation of policies generates the "Compliance" referred to by Van Meter and Van Horn (year), so that, for example, the urban planning and construction licenses required for their development are processed legally and in a timely manner by the owners.

Method

The development of the research focuses on a mixed design, by exposing in a qualitative way the analysis of an exhaustive bibliographic review about the concepts and implications of urban resilience and social housing; in a quantitative way, surveys were applied to analyze the variables that, from the point of view of the actors in the design and construction of this type of housing, have regarding the introduction and execution of the key concepts of this research. In addition, the analysis focused on the study of a reality of academic, professional and institutional character without intervening, describing the correlations of the content analysis AC[b], in six steps defined for this purpose: (a) Selection of sampling units (Normativity VIS in Colombia); (b) Selection of analysis categories (Urban Resilience and Adequate Housing vs. VIS); (c) Selection of register units (Normativity articles, directly related to the development of VIS at the urban level); (d) Determination of analysis units (Theoretical concepts of Urban Resilience and Adequate Social Housing); e) Determination of the variables (Properties of Urban Resilience and Adequate Social Housing) and f) Selection of the modalities for measurement and evaluation (Quantitative or extensive modality, according to Álvarez, I (2021) applied, when the amount of material is large and an overall view is desired in order to make comparisons (statistical data, frequencies and their relationships).

The content analysis included 16 laws and decrees at the national level such as Law 1523 of 2012 (National Disaster Risk Management Policy) and Decree 1077 of 2015 (Single Regulatory Decree of the Housing, City and Territory Sector), in addition to the development plans at the national, departmental and municipal levels, as well as in-depth or qualitative, unstructured interviews and surveys to architects and civil engineers of the existing guilds in Popayán; teachers and students of architecture and civil engineering of academic programs in the city; public officials of entities responsible for the process (Municipal Mayor's Office - Savings and Housing Corporations, Urban Curator's Offices).

For the CA, on the VIS, and following the United Nations (2010) principles on Adequate Housing, 9 Dependent Variables (DV) were applied as follows: (1) Security of tenure; (2) Availability of services; (3) Materials; (4) Facilities and infrastructure; (5)

[b] According to Álvarez, I (2021) the Content Analysis (CA) method can demonstrate the behavior of different variables in an official or political discourse over a significant period by means of log percentages that indicate the degree of importance attached to them.

Affordability; (6) Habitability; (7) Accessibility; (8) Location; and (9) Cultural appropriateness.

In the same process for Urban Resilience, 4 Dependent Variables (DV) were applied: (1) Metabolic Flows, (2) Social Dynamics, (3) Governance Networks and (4) Built Environment, according to Mallqui (2012).[c]

Results

As a result of the CA, the corresponding national, departmental and local regulations applicable to the development and improvement of VIS and its articulation with Urban Resilience are presented (Figure 1). In this regard, only 2.33% of the regulations applicable to the VIS (1,628 articles) include variables related to Urban Resilience, emphasizing Social Dynamics with 15 points, followed by Governance Networks with 9 points; the Built Environment with 8 points and Metabolic Flows with 2 points.

Figure 1

Analysis of VIS regulations in relation to the 4 variables on Urban Resilience

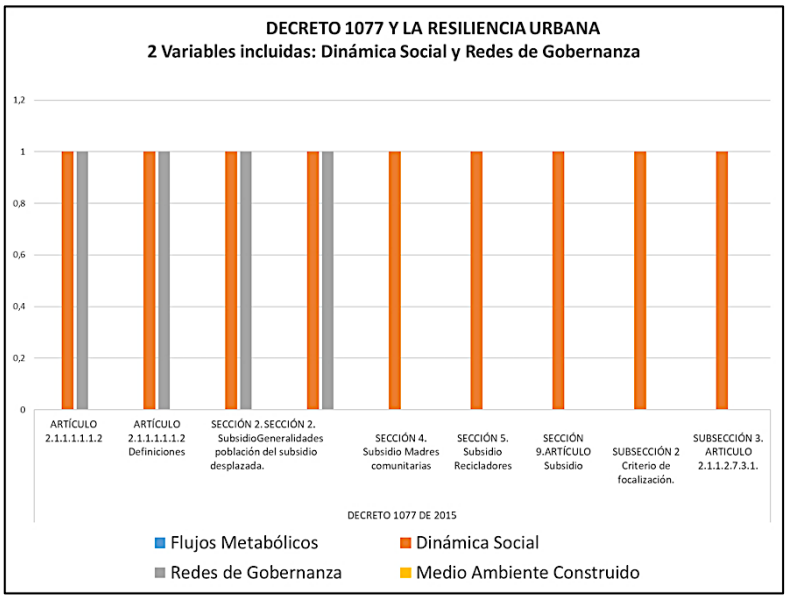
	NORMA	Flujos Metabólicos	Dinámica Social	Redes de Gobernanza	Medio Ambiente Construido	Total sobre 4 variables
1	LEY 388 de 18 de julio de 1997. Modifica Ley 9 de 1989 y Ley 3 de 1991.	0	1	1	1	3
2	Plan de Ordenamiento Territorial. Municipio de Popayán. Acuerdo 06 del 5 de agosto de 2002. Por el cual se adopta el Plan de Ordenamiento Territorial para el municipio de Popayán.	1	1	1	2	5
3	LEY 1454 del 28 de junio 2011. Normas Orgánicas sobre el Ordenamiento Territorial.	1	3	2	1	7
4	LEY 1523 del 24 de abril del 2012. Por el cual se adopta la Politica Nacional de Gestión del Riesgo de Desastres y se establece el sistema Nacional de GRD	0	1	2	1	4
5	LEY 1537 del 20 de junio del 2012. Normas tendientes a facilitar y promover el desarrollo urbano y el acceso a la vivienda	1	0	2	0	3
6	DECRETO 1807 del 2014. Reglamenta el artículo 189 del Decreto-ley 019 de 2012 en lo relativo a la incorporación de la gestión del riesgo en los planes de ordenamiento territorial	0	0	1	0	1
7	DECRETO 1077 del 2015. Decreto único regalmentario del sector Vivienda, Ciudad y Territorio.	0	9	4	0	13
8	LEY 1848 DEL 18 de julio del 2017. Formalización, titulación y reconocimiento de las edificaciones de los asentamientos humanos de predios urbanos.	0	0	0	1	1
9	PLAN NACIONAL DE DESARROLLO.Colombia potencia mundial de la vida. 2022-2026	2	4	6	3	15
10	DECRETO 1533 DE Agosto 2019. "Por el cual se modifican algunas disposiciones del Decreto 1077 de 2015 en relación con la asignación del Subsidio Familiar de Vivienda y se dictan otras disposiciones"	0	2	5	0	7
11	PLAN DE DESARROLLO DEPARTAMENTAL DEL CAUCA 2020-2023. Ordenanza 032 del 11 de junio del 2020	1	1	1	0	3
12	PLAN DE DESARROLLO " CREO EN POPAYAN" 2020-2023. Acuerdo 007 del 29 de mayo del 2020	0	8	2	4	14
13	LEY 2044 del 30 de julio del 2020. Normas para saneamiento de predios ocupados por asentamientos humanos ilegales.	0	1	1	0	2
14	DECRETO 1232 del 14 de septiembre de 2020. Adiciona y modifica Decreto 1077 de 2015	1	1	2	2	6
15	LEY 2079 del 14 de enero del 2021. Disposiciones en materia de Vivienda y Hábitat	0	4	3	1	8
16	DECRETO 651 del 27 de abril del 2022, Se adiciona el Decreto 1077 de 2015	0	0	0	1	1
		2	15	9	8	34

[c] According to Malqui (2012) these variables are described as follows: Metabolic flows are the chains of production and consumption within an ecosystem whose size always exceeds the limits of a city; it is it is the productive capacity of energy, material goods and services necessary for the well-being and quality of community life; the social dynamics related to demographics, human capital, inequality, population, distribution and diversity; governance networks referring to institutional structures and social organizations; the built environment, focusing on eco-systemic services and urban landscapes.

Regarding the norm with the greatest articulation with the research, Decree 1077 of 2015, the basic document for the development of this type of housing, 8 of the 517 articles that refer to VIS (total: 1879 articles) include some indicator on the topic of Resilience. That is, 1.54%, referring to only 2 variables: Social dynamics: 9 points and Governance Networks 4 points (Figure 2).

Figure 2

Analysis of Decree 1077 in relation to Urban Resilience



It should be noted that the variable with the greatest weight is Social Dynamics, which refers to the population that can benefit from government subsidies and households affected by anthropic vulnerability. This is followed by the Governance Networks variable, which includes the territorial entities involved in the process, their activities, self-management systems or community participation; therefore, it is a policy approach to aspects related to housing affordability.

Regarding the analysis of procedures and processes required for the development and improvement of constructions destined to VIS, these results on Urban Resilience are presented, at the level of the Housing Office and the Planning Secretariat of the Mayor's Office of Popayán and the Urban Curator's Offices:[d]

- Basically, the Ministry of Housing, City and Territory only focuses on economic issues, not on environmental, health and hygiene issues. Support for housing that reflects the social term is considered limiting in terms of safety, quality of life and human integrity.
- The current projects do not respond to the productive capacity, favoring a culture of non-compliance, the ignorance of norms and laws that socially benefit and economically activate the cities and their inhabitants, and favoring unlicensed construction causing an exposure not only of their homes, but of the loss of life of its inhabitants.

[d] Private entities in charge of processing and issuing construction licenses.

- The last houses built are only designed based on profitability, not on how the family is supported (self-sustainable housing), which saves water, energy and transportation due to its location in relation to work.
- Overcrowding: No thought is given to the integrity and safety of the population (Pandemic). The resilience of human beings to situations that limit access to new opportunities for growth and development will be complex.
- There is no direct relationship of resilience and housing design and construction. The POT determines where the threats are for VIS in general. This is a cultural issue, people build what they can, even if it does not meet the standard (e.g., kitchens and rooms without ventilation).
- The VIS standard cannot be the general standard for housing. The foregoing is based on geographical characteristics, exposure to natural and/or anthropic hazards, the areas of cession, the burdens in relation to the projection of common areas, among other considerations. As a result, it is necessary to achieve a balanced integration between infrastructure development and the quality of life of cities and their inhabitants. The municipality has not managed to generate the VIS standard and, in addition, the POT is temporary, as it has not been updated for 20 years.
- Incentives are required for sustainable construction, which is not applied in Popayán, it is necessary to start demanding it and define what the incentives are. For example, defining integral improvement zones.
- The production of housing is important, but not the generation of living conditions for the population.

Concluding, in the results of the interviews applied to demonstrate the hypothesis defined in the research, it is corroborated that the current regulations focus on economic aspects, do not include the productive capacity, the profitability of housing, its habitability, its improvement, without a precise definition on Adequate Housing and its characteristics, as seen in the analysis made to Decree 1077 of 2015, where only 7 of the 517 articles that refer to the VIS (total : 1879 items), include some indicator on the topic of Adequate Housing. That is, 1.35%. with variables of Availability of services 7 points; Habitability: 5 points: Affordability with 3 points: With 1 point the variables of security of tenure; Accessibility and Location and with 0 points the Cultural Adequacy, this last aspect is very common in projects of this type where the architectural response to the cultural identity of each city is complex (Figure 3).

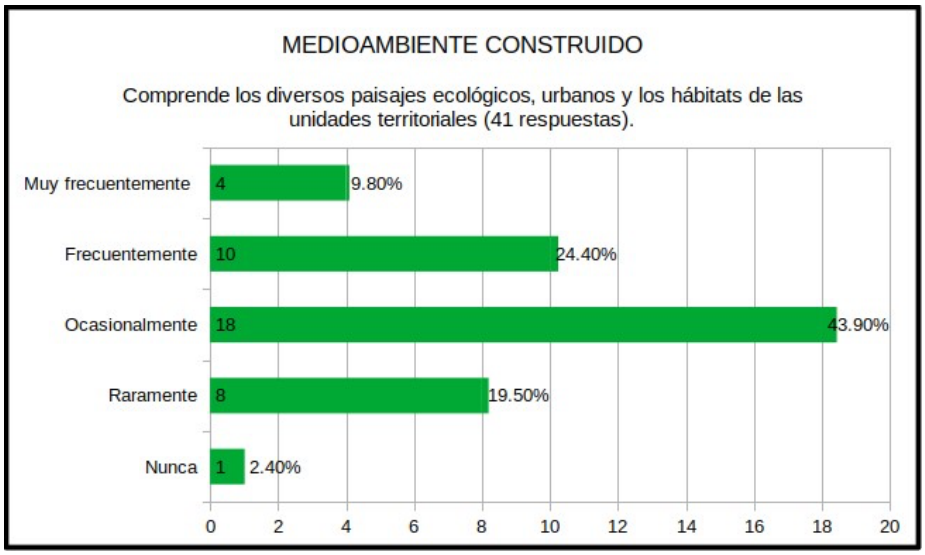
Figure 3
Social housing project in Popayán

On the other hand, at the academic level, relating the knowledge and experience of the three academic programs of Architecture in Popayán: Universidad del Cauca; Fundación Universitaria de Popayán and Institución Universitaria Colegio Mayor del Cauca, the results obtained by applying surveys to students are related as follows:

From a sample of 41 students linked to the 3 Architecture programs in the city, a predominance of the following variables is found with respect to Urban Resilience: Metabolic Flows with 36.6 % and Social Dynamics with 41.5 %; Governance Networks with 34.1 % and Built Environment with 43.9 %. Results that reflect knowledge from training in Architecture in relation to metabolic flows (as mentioned above, related to production chains, supply and consumption) and Social Dynamics related to human capital, with deficiencies in the area of governance networks or institutional structures and social organizations vis-à-vis public policies. As well as deficiencies, as shown in Figure 4, in the built environment variable referring to the ecosystem services or benefits that nature contributes to the city.

Figure 4

Results of the Architecture-Resilience (Environment) student surveys.



Aspects included in the analysis of the study plans in Architecture, of the three institutions of Higher Education involved, whose results define that of the 503 credits that correspond to the study plans of the academic programs of Architecture, 40 corresponding to 8 subjects are related to the variables of social dynamics and the built environment, but not exactly from the vision of *Urban Resilience,* but as components of urban analysis focused on architectural and urban design.

In the analysis related to the study plan of the Civil Engineering academic program, the knowledge on Disaster Risk Management predominates, another transversal aspect to the problem analyzed in the research and at the level of the students' surveys, the variables of social dynamics, metabolic flows and built environment prevail, with shortcomings as in the Architecture programs, with the variable of governance networks.

Discussion and conclusions

In view of the results obtained on the high existing disarticulation of only 2.33% between the theory on Urban Resilience and the public policy of Social Interest Housing applied in Popayán, as well as the low levels of knowledge on Urban Resilience among professionals and students of Architecture involved in the processes of design, improvement and approval of VIS projects and considering that the period in which the present research is concluded, corresponds to the process being carried out for the review and adjustment of the POT by the Secretary of Municipal Planning of Popayán, added to the end of the term of the Mayor of Popayán and therefore the termination of the term of the Mayor of the city and therefore the termination of the Development Plan analyzed in the research, the proposed solution involves the generation of a long-term territorial strategy of a political and administrative nature, which includes the articulation of Urban Resilience with the development of SIV, from the approach of the United Nations for Adequate Housing.

The project proposed as a result of the research is called: Adequate Social Housing and its articulation with Urban Resilience in Popayán. Its objective is to propose political and administrative strategies to articulate and apply Urban Resilience in VIS projects.

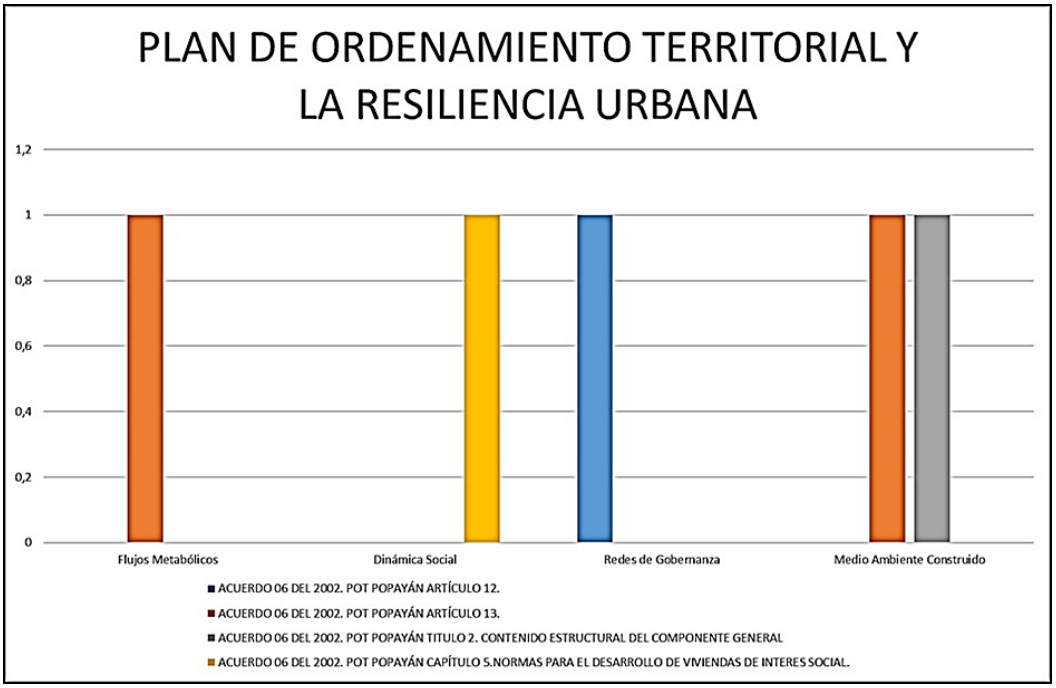
Project based on the analysis of the mission of the Secretary of Municipal Planning: "to guide the formulation, execution and evaluation of the Municipal Development Plan and coordinate the Municipal Planning System, formed by the institutional and community sectors by conducting comprehensive studies of the municipal situation in order to visualize strategic orientations towards the economic, social, environmental and institutional development of the municipality through the formulation, implementation and evaluation of plans, programs and projects with community participation and articulated to the departmental, regional and national planning".

The conclusion of the research on the inclusion of Urban Resilience in 25% of the 20 articles of the Development Plan that relate to the VIS, its inapplicability so far, without actions that demonstrate that in addition to the responsibility of all authorities, decision makers need to implement actions that help to decrease the direct impact with the daily activities of citizens or settlers.

In addition to the study of the current POT, a fundamental document for urban development, it is found that 4 of the 236 articles that are part of the regulation and are related to the research topic include some indicator on resilience, that is, 1.69%, related to the built environment with 2 points; metabolic flows, social dynamics and governance networks with one point each, as shown in Figure 5.

Figure 5

Analysis of the current Land Management Plan in relation to Urban Resilience



Consequently, the following policies related to the research approach are proposed, by analyzing regulatory, academic and professional aspects in design, improvement and approval processes of social housing projects, as follows:

1. Link the theory on Urban Resilience with public policy related to the development of the VIS, through the updating of the regulatory framework that defines the Land Management Plan for the municipality of Popayán, with emphasis on the urban area, so that its applicability is mandatory, promoting corrective and anticipatory risk management, in addition to preparedness for response to natural or anthropogenic events that may affect a community.

2. Strengthening of the Municipal Planning Secretariat, with the creation of an office or unit to support activities related to Urban Resilience, with citizen participation and covering not only Social Housing, but other factors involved in the urban process. To this end, it is necessary to develop a specific project that justifies the need for this function to be part of the processes of the Planning Secretariat, considering that it is a strategic management area, with an impact on the action plans and the project bank of the municipality of Popayán.
3. To promote alliances with Higher Education Institutions to promote knowledge and research on Urban Resilience and its articulation with the VIS.
4. Establish a collaborative work with the Architects and Civil Engineers guilds, to link Urban Resilience in the processes of design, improvement, approval procedures and construction of the VIS.

Proposal in line with the brief guide for local authorities of the Idea Foundation (2017) and the six challenges that include a local knowledge of the problem that recognizes the risks, citizen participation, the ability to face the resistance that may arise because it is a political project, also considering that the process is not immediate, but requires a medium to long term and the complexity of this by incorporating several actors.

The proposal is also based on the publication Habitat III Issues. 15 -Urban Resilience, by seeking to contribute to building Resilience, through the three pillars of the New Urban Agenda namely: Urban Planning; Urban Legislation and Municipal Financing, by taking advantage of planning instruments, such as the POT, the updating of existing public policy for the study area at the local level, specifically Chapter 5 Norms for the development of Social Interest Housing, articles 197 to 205 of Agreement 06 of 2002, which adopts the Land Management Plan for the municipality of Popayán, and the development of mechanisms and instruments that facilitate consistency between the regulations and entities such as the Urban Curators of Popayán, developing instruments that promote consistency among the actors and encourage compliance with these changes in the regulations.

Regarding the standard related to housing design and improvement, as recommended by Rolando Arturo Cubillos González (2017) by incorporating four Resilient Social Housing design principles: Flexibility, energy efficiency, habitability and affordability (p.20), according to the research carried out, it is necessary to add other aspects such as spatial and constructive quality, safety against natural and anthropic hazards, adequate public and complementary services, access to production chains, productive capacity and quality of community life.

To initiate the management of the 4 policies (linkage, strengthening, dynamism and collaborative work) we propose the internal analysis of the Municipal Planning Secretariat, the Housing Office of the Municipal Infrastructure Secretariat and the Municipal Risk Management Office, based on what is established in the Guide of the Fundamentals for Project Management PMBOK seventh edition (2021), so that it is possible to know the tools, documentation, existing databases in each unit, the tacit knowledge of officials who can support the process or the need to hire other professionals, data protection, the infrastructure available for the jobs required, equipment, communication channels, hardware and software, automated systems, employee capacity and availability of resources, by way of a general diagnosis.

As part of the external environment, similar aspects should be analyzed in the institutions of Higher Education analyzed that have academic programs in Architecture and Civil Engineering and that were part of the research, with the possibility of involving other academic programs of these institutions or others, with areas of knowledge related

to the topics, such as disaster risk management, delving into the research groups, the lines of research they manage, the research workshops, social practices, internships, agreements and other academic alternatives that can contribute to the process.

Externally, it will also be necessary to know the conditions and contributions that may be generated by associations such as the Colombian Society of Architects (SCA) Cauca regional and the Cauca Association of Engineers, in compliance with Article 5, among other aspects. - SCA's corporate purpose is to integrate architects in solidarity in order to develop professional activities to foster, develop and promote the academic and cultural social function of architecture.

The analysis conducted in this research presents as a prelude to the formulation of the proposed policies, so as to have a basis to start the process with the community, users and beneficiaries of this type of housing, bearing in mind the definition of the Idea Foundation (2017), when expressing that resilience "is not only a policy or a program: is the integration of a set of capacities and resources" , therefore, the proposal to generate a territorial strategy that contributes to the solution of the existing problematic regarding Urban Resilience and Social Housing, as a result of a research project, will require continuing with a process that implies among other aspects for its implementation, what is established by Van Meter, D.S., and Van Horn, C. (1993) as a successful implementation when commitments to the marginal situation and consensus to unattainable goals are integrated from a particular and specific perspective for each of the communities and cities that are obliged to be resilient to extreme situations, whether natural or anthropic. Finally, this research shows that political and administrative imposition of major changes and consensus on goals is very low, resulting in doubtful prospects for effective implementation. Furthermore, we can affirm that policies involving major changes and, simultaneously, a high degree of consensus will be implemented more successfully than those involving minor changes, but also under a low degree of consensus.

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