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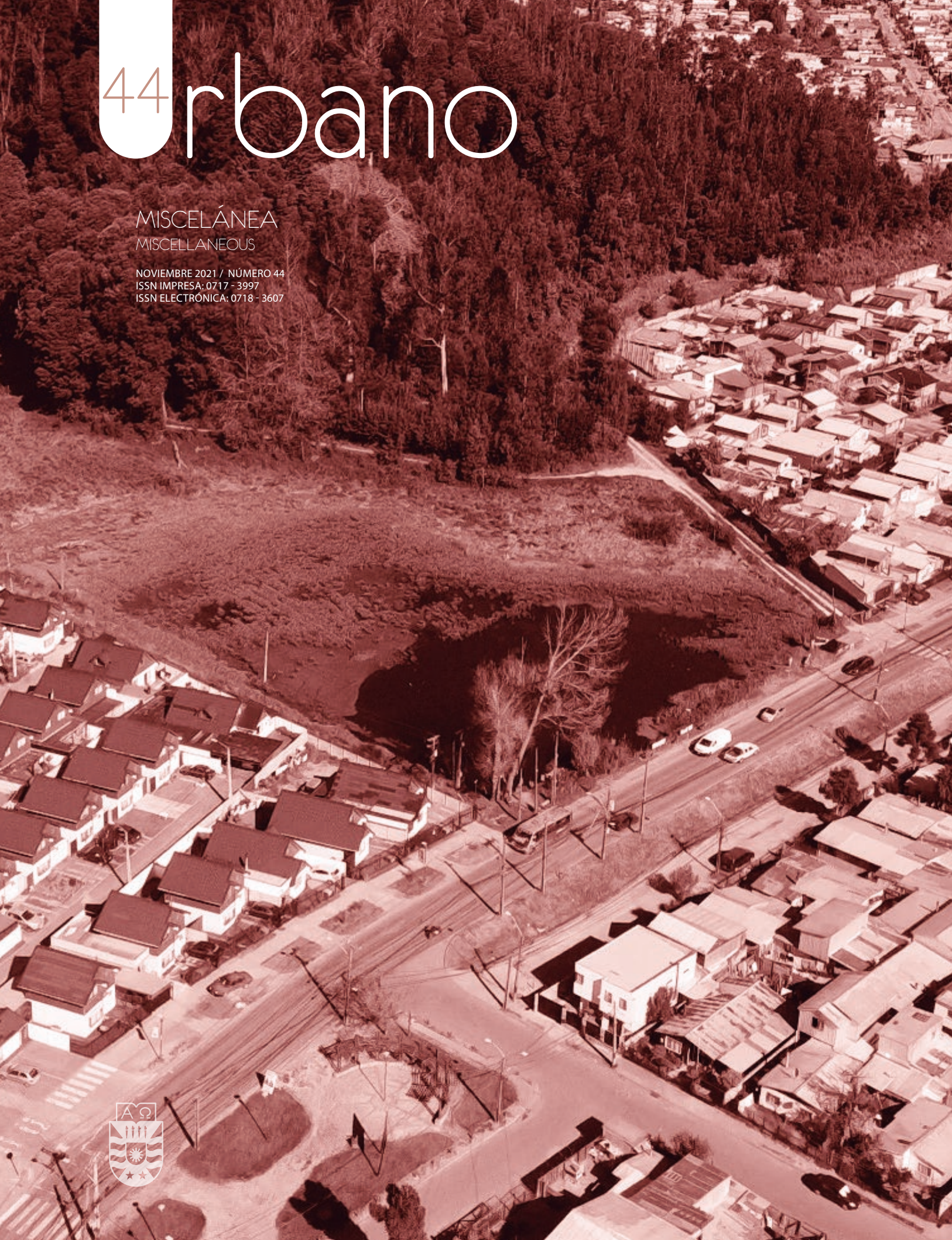

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EDITORIAL
ANA ZAZO MORATALLA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 4 - 7
ISSN 0717 - 3997 / 0718 - 3607

EDITORIAL

Editorial

ANA ZAZO MORATALLA 1

Red alert for urban wetlands 2

Last November 17th, a fire started by a flare, laid waste to 10 ha of the Paicavi urban wetland in Concepción, which is part of the larger Rocuant-Andalién water system. The incident once again raised a red flag for these green spaces, which have been left behind in Chilean urban management and planning in recent decades, on not having been acknowledged as urban green infrastructure, or as part of a broader environmental matrix.

In the academic sphere, urban wetlands have been acknowledged. Although initially the view was more conservationist in nature, linked to their biological diversity, and their ecosystem values as water reserves -hydrophyte vegetation and stopovers for migrating birds-, as the decades have gone by, they have started to be viewed as settings that provide an important number of ecosystem services to urban settlements: water and temperature regulation, CO_2 capture, water purification, leisure and recreation and, in the case of Chile, mitigation for natural threats like tsunamis.

From the protection point of view, the Convention on Wetlands of International Importance (1971), commonly known as the RAMSAR Convention, led by non-governmental conservation organizations, established the first globally coordinated institutional framework to protect this unique type of ecosystem. This framework was built upon three basic pillars: (1) the designation and management of wetlands within the Ramsar network; (2) the prudent use of wetlands; and (3) international cooperation. However, the focus of the network has evolved. While initially, the identification of wetlands to protect habitats of migrating birds was its first goal, in the 1980s the second pillar gained weight. In the 90s and at the turn of this century, the discourse moved onto the protection and evaluation of ecosystem services that the wetlands provide, associating them to the implications for the quality of life, before then moving to involve communities and associated agents. But despite the complexity that was added to the discourse, urban wetlands were not formally recognized as a concern of the RAMSAR discourse until 2008, with resolution X.27. Furthermore, the general principles to establish governance of urban wetlands and the basic principles to guide their management were not determined until resolution XI.11 in 2012. This tardy international recognition has slowed down institutional action for the most at-threat wetlands.

The conceptual frameworks from which aspects have been studied have also been evolving. From a basic framework, where the protection and management of these spaces was the focus of extra-urban wetlands, to intra-urban concepts, like urban ecology, which appear to have garnered strength in recent decades. This is based on the understanding that ecological processes and interactions among the social and ecological dimensions in an urban ecosystem are very different from those taking place in non-urban settings.

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2 We would like to thank Patricio Ortiz Soazo, member of the Bio-Bio Wetlands network, and President of Fundación Bandada, for talking to us, which allowed having updated information about the presentation of files, and about the shortcomings of the Urban Wetlands Law.

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Figure 1, 2 Humedal Paicaví,Concepción 2021. Camilo Riffo

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ANA ZAZO MORATALLA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 4 - 7
ISSN 0717 - 3997 / 0718 - 3607

In the Chilean domestic context, the lack of a regulatory framework for recognition and protection, quick urban transformations from a neoliberal logic, alongside indifference about the values these ecosystems provide, have fostered an urban siege and the disappearance of many wetlands. The threats have not changed much in recent years: deficient urban planning that disregards them, urban sprawl, fragmentation by infrastructures that see them as urban vacuums, refills, drainage, contamination, the destruction of flora or harassing of fauna by passersby, pets, and grazing, have been the main causes behind their reduction and degradation.

The Metropolitan Area of Concepción, due to its location on coastal land that once was a fluvial-deltaic plain, has an interconnected underground water system that on the surface emerges as a large number of lacustrine and wetland spaces. The value of their flora and fauna have been widely identified and recorded, however, they still experience the problems identified domestically.

In the last decade, the support given to these water bodies has been diverse, both from socioenvironmental associations, where the Bio-Bio Wetlands Network stands out, which emerged in 2017 as a socio-environmental organization to take into the public sphere the positive values of wetlands; and from the academic area, which has focused on providing data and indicators on the loss of biodiversity and wetland surfaces, whether in scientific journals or through digital platforms open to the general public (see urbancost.cl)

The joint work of both blocks on a national scale led to the passing of Law 21.202, in 2020, whose purpose is the protection of urban wetlands which, in many aspects, brought hope for these strongholds of socioecological biodiversity in the city. The Regulations of the Law, published on July 30th, establish that to label space as a wetland, it must at least have one of the following criteria: (1) the presence of hydrophyte vegetation; (2) the presence of wet soil with poor or no drainage; and/or (3) a hydrological saturation system, be this permanent or temporary, that causes regular flooding. It also defines some minimum sustainability criteria, for sustainable management and the governance of urban wetlands.

To date, there are already 33 wetlands cataloged domestically, two of which belong to the Metropolitan Area of Concepción, Laguna Rayencura in Hualqui, and Paso Seco Sur in Coronel. There are another two in Lebu, one in Cañete, and a further one in Los Ángeles. The Bio-Bio Wetlands Network is set up in work committees that support councils in writing up files so that these can present the request. In Coronel, several files have already been presented. In Concepción, two were prioritized, Cárcamo Wetland, hidden amid the gorges of Caracol Hill (Cerro Caracol), and Pichimapu Wetland, in the Nonguén neighborhood, currently reduced in size and besieged by possible new property development. This accompaniment is also being given to the councils of San Pedro de la Paz and Hualpén, seeking to change the way the city has worked with these wetlands up until now.

Nevertheless, the urban wetlands law, which provides an initial framework for their protection, particularly in domestic identification, and in the description of minimum criteria, is not enough to ensure their long-term continuity. It leaves the management, implementation of governance, monitoring, inclusion, along with their recognition and protection within urban and territorial planning, in the hands of councils. This task, which is so relevant for the continuity and sustainability of urban wetlands, is left without any controlling body until the Biodiversity and Protected Areas Service, part of the Ministry of the Environment and future successor of CONAF, is approved and implemented. This is expected to administer Protected Public Areas and supervise private ones, prepare and update management plans, and will be in charge of monitoring. On the other hand, the Regulation indicates that any project developed in these areas must undergo an environmental impact assessment, but it does not restrict the possible development of projects within the area marked off as a wetland, as such the lack of determination under which sustainability and the rational use of urban wetlands are defined, becomes ever more concerning.

Finally, it is not much use to make progress with protection legislation without running a series of awareness campaigns to companies and citizens about the values of urban wetlands. To the former, so that they prefer to not pay fines on including the environmental dimension as a red flag, and the latter, so that they recognize not just the values, but also the fragility of these spaces.

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PÁG. 8 - 19
ISSN 0717 - 3997 / 0718 - 3607

THE IMPOSSIBLE STROLL THROUGH THE UNREACHABLE CITY, REYNER BANHAM'S URBAN ECOLOGIES REVISITED [1]

EL PASEO IMPOSIBLE POR LA CIUDAD INABARCABLE, UNA RELECTURA DE LAS ECOLOGÍAS URBANAS DE REYNER BANHAM

JAVIER MALO DE MOLINA BODELÓN [2]

1 Este artículo recoge resultados de la tesis doctoral enmarcada en el "Programa de Doctorado Transversal en Arquitectura y Urbanismo" de la Escuela Técnica Superior de Arquitectura de Madrid (UPM).

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EL PASEO IMPOSIBLE POR LA CIUDAD INABARCABLE,
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PÁG. 8 - 19
ISSN 0717 - 3997 / 0718 - 3607

La ciudad de Los Ángeles es, seguramente, la primera ciudad surgida auténticamente como resultado de la amplia popularización del uso del automóvil y, por tanto, no debería extrañar que la comprensión analítica y sintética de su naturaleza profunda esté asociada a este medio y a las infraestructuras que lo posibilitan. Así lo entendió el crítico e historiador Peter ReynerBanham cuando asumió que sólo al volante de un vehículo podría descubrir la auténtica idiosincrasia de esta insólita ciudad que la crítica europea más ortodoxa despreciaba incapaz de extraer una síntesis que la explicara. Lo que sucedía es que la ciudad se presentaba como pionera de una nueva forma urbana que, apoyándose en el uso masivo del automóvil y la vivienda unifamiliar característica de la ciudad jardín suburbana, proponía una descentralización absoluta como alternativa a la ciudad compacta industrial. En 1971, Banham publicó un texto hoy canónico, *Los Angeles, The Architecture of Four Ecologies*, que pretendía desvelar una imagen clara y sintética de la ciudad. Este artículo destaca lo principal de la propuesta de Reyner Banham y busca ampliar su planteamiento teórico-que maneja las escalas estructural y morfológica- a una tercera escala -la de la percepción sensorial de la experiencia física del espacio- a partir de algunas obras académicas de referencia, pero también a partir de referencias literarias de escritores vinculados a la ciudad, en un intento por trasladar la visión poética y sensible al campo de los estudios urbanos. Esta visión permite mostrar un cambio de paradigma respecto de la relación que establece el habitante de una ciudad contemporánea como Los Ángeles –y, por extensión, tantas otras- con el escenario de la vida colectiva que representa el espacio público

Palabras clave: Ciudad, morfología urbana, paisaje urbano, percepción

The city of Los Angeles, CA, is, for sure, the first city to authentically emerge as a result of the widespread popularisation of automobile use, and it should, therefore, come as no surprise that the analytical and synthetic understanding of its profound nature is associated with this means of transportation and the infrastructures that make it possible. This is how the critic and historian Peter Reyner Banham understood it, when he proposed that only from behind the wheel of a vehicle could it be possible to reveal the true idiosyncrasies of this unusual city that the most orthodox European critics rejected, who were unable to extract a synthesis that could explain it. What was happening was that the city appeared as the pioneer of a new urban form which, relying on the widespread use of the car and the single-family dwelling, which is typical of the suburban garden city, proposed an absolute decentralisation as an alternative to the compact industrial city. In 1971, Banham published a now canonical text -*Los Angeles, The Architecture of Four Ecologies*- which aimed at revealing a clear and synthetic image of the city. This article highlights the main points of Reyner Banham's proposal, looking to expand its theoretical approach -which handles the structural and morphological scales- to a third scale: that of the sensory perception of the physical experience of space, based on some academic works of reference, but also on literary references by writers linked to the city in an attempt to transfer the poetic and sensitive vision to the field of urban studies. This vision makes it possible to show a change of paradigm regarding the relationship that the inhabitant of a contemporary city like Los Angeles -and, by extension, so many others- establishes with the scenario of collective life, represented by public space.

Keywords: City, urban morphology, urban landscape, perception

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REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 8 - 19
ISSN 0717 - 3997 / 0718 - 3607

I. INTRODUCTION

In 1971, the historian, Peter Reyner Banham published his famous book on the city of Los Angeles, titled *Los Angeles. The Architecture of Four Ecologies*. A book on a city that, in the eyes of the critique, appeared as incomprehensible. Mumford (2021, p. 850), for example, repudiates the city under the label of "undifferentiated mass". But Banham showed that it was possible to understand it, and set out a theoretical framework that studied the form of the contemporary city using two fundamental scales – structural and morphological -, implicit in his analysis. As a result of the recent translation of Reyner Banham's text into Spanish (2016), this article critically reviews his vision, and proposes enriching it by adding a third scale to his outline, the perceptive – the outcome of the view of the person who goes around the city experiencing its form-, in an attempt to complete the perspective of the studies on the form of the city presented in the aforementioned book. For this, the article is based on academic reference documents that introduce this third scale, but also on the works of literary authors where the singularities of the city of Los Angeles appear well defined, providing an expressive and poetic value that urban studies should not avoid.

The approach from the shape is precisely one of the most valuable aspects of the British author's book, which perhaps has not been fully understood: the review of Plagens (1972) and Davis (2003, p. 55-57), for example, are, above all, of a social nature, but neither appears to assume that the approach of Reyner Banham is structural and morphological. Its reading gives back a synthetic image of the shape of the city of Los Angeles, that allows understanding it as a whole. The broader scale – the structural – shows the geographic context the city lies within – coast, hills, plains-, the infrastructure network that organizes its spatial connectivity – the large highways-, and the infinite mosaic of basically single-family residential pieces. The morphological scale, in his approach, makes it is possible to distinguish the characteristics of the residential mosaic, and facilitates the differentiation between the cookie-cutter single-family home, repeated *ad nauseam* through the plains in the valley, and the singular single-family homes of the elite, settled in the hills. This scale also shows the implacable process of spatial segregation that is engrained in the city from the way itself, that its infrastructures impose.

This article, as a theoretical contribution that complements the vision of Banham (2016), proposes a perceptive scale that introduces the analysis of the urban atmosphere -just as the Situationist International outlined (Careri, 2015, p. 74)- in an attempt to synthesize it in a series of eloquent literary and poetic images that contributes towards understanding the immediacy of the experience of the person that inhabits the city.

This three-scale approach contributes towards understanding the physical space of the city of Los Angeles, against the *cliché* that paints it as an incomprehensible city. However, its break down into pieces will really give us back an immeasurable city, albeit not in intellectual terms, but rather in physical ones. A city that is so extensive and syncopated that, on its closest scale, will only accept being experienced by car, a complement of the self-absorption that the single-family dwelling fosters. Both circumstances reduce the exposure of the person to their fellow citizens, and therefore, their living experience, thus transforming their social nature in a major way.

II. CONCEPTUAL FRAMEWORK

This article falls within both the morphologist tradition that Manuel de Sola-Morales vehemently defined in Spain, always arguing for an urbanism that had to clearly reflect its belonging to the architectural area, as study and intervention on "the pure physical shape" (Sola-Morales, 2008, p. 15), and on the perceptive view, which since the end of the 1960's, Kevin Lynch (2001), Gordon Cullen (1964), or even Jane Jacobs (2011) and Jan Gehl (2006) introduced; all of them very critical of the urban proposals of the Modern Movement to which they ascribe a lack of projectual depth as a consequence of overlooking a scale that fosters civic sociability and that provides complexity and variety to the urban whole. Facing the criticism that Banham's perspective received (Plagens, 1972; Davis, 2003, p. 55-57), this paper defends the relevance of a contribution focused on the analytical and synthetic understanding of the physical body of the city, and complements it by highlighting its consequences on human experience.

Reyner Banham started his exploration and discovery of Los Angeles as a response to an academic position which, as Fishman (1987, p. 156) states, rejected the city with the excuse of its novelty and immensity. Los Angeles challenged the modern concept of metropolis as such, and how it had been considered since the Industrial Revolution: how could one speak of a city in a place that had no clearly distinguishable urban center?

III. HISTORICAL FRAMEWORK

The city of Los Angeles represents an authentic change of paradigm in the history of the suburban garden city. Both the 18th century suburbs on the outskirts of London, and those raised along the railroad networks in Philadelphia and other industrial cities in the United States in the 19th century, were subordinate to a central city (Fishman, 1987). They were shelters for a wealthy and privileged minority, whose project aspired to represent an alternative to the compact city model. In Los Angeles, the single-family

EL PASEO IMPOSIBLE POR LA CIUDAD INABARCABLE,
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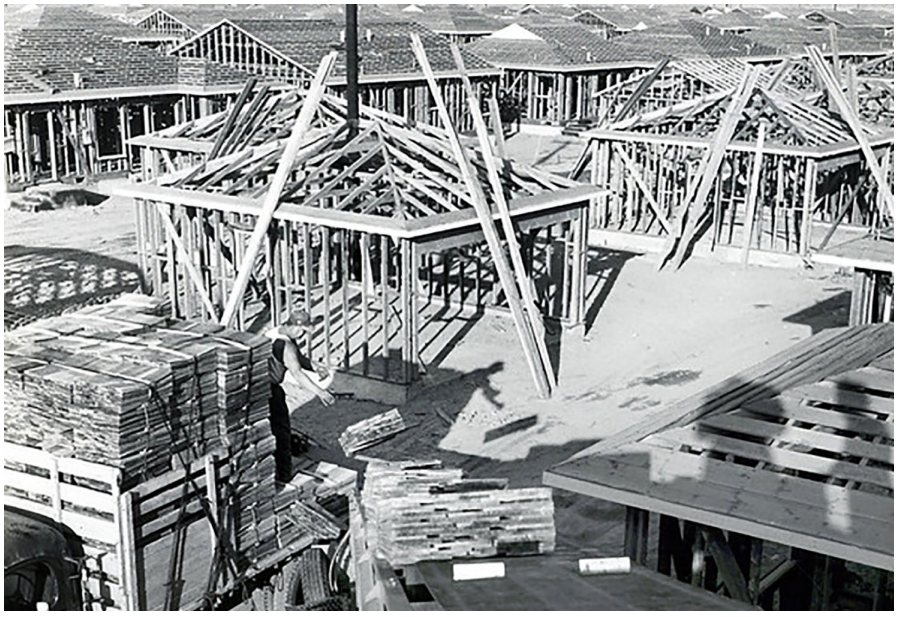
PÁG. 8 - 19
ISSN 0717 - 3997 / 0718 - 3607



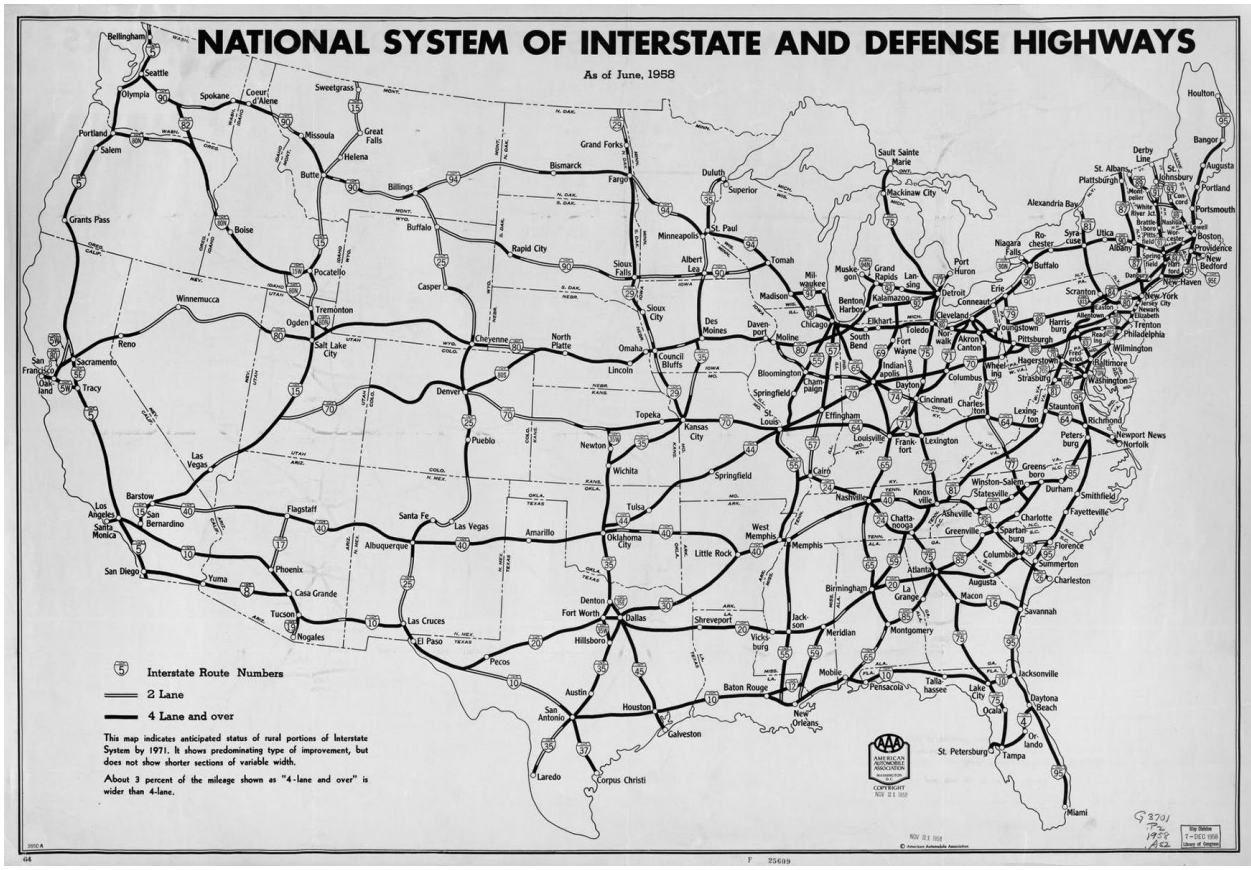


Figure 1. The Balloon Frame system in an advertisement in Lakewood, California. Source: Nicolaides & Wiese (2006, p. 266)
Figure 2. 1930's advertisement of the Federal Housing Administration (FHA). Source: Federal Housing Administration (circa 1930).
Figure 3. Cartography of the first interstate highway network Source: American Automobile Association (1958).

EL PASEO IMPOSIBLE POR LA CIUDAD INABARCABLE,
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PÁG. 8 - 19
ISSN 0717 - 3997 / 0718 - 3607

dwelling abandons its peripheral condition to become the star element of the entire city (Fishman, 1987, p. 155). But under the framework of the suburban ideal, there are three key elements prior to its consolidation that would promote its transformation into the suburban metropolis that it became from the second half of the 20th century: first, the extraordinary simplification and standardization of the construction processes linked to the single-family dwelling, thanks to the appearance and dissemination of a very simple construction system known as balloon frame (Figure 1), which allowed raising a very quick construction (Jackson, 1985, p. 126); second, the ease of acquiring property ownership, backed by the Government through the Federal Housing Administration, whose role is to grant guarantors for long-term loans provided by private entities -as can be seen in an advertisement of the 1930s (Figure 2)- to buy, build, or remodel a dwelling (Jackson, 1985, p. 204); and third, the development and financing of an extremely broad network of highways (Figure 3), created through the sponsorship of the Interstate Highway Act of 1956 (Jackson, 1985, p. 249). Thus, the history of Los Angeles is that of the emancipation of the suburb from the urban center. In the Californian city, the single-family dwelling become one of the key elements of the urban structure. The version of suburb materialized in Los Angeles was built as a decentralized city without either functional or emotional ties with the city center, and with a transportation network designed to almost exclusively serve the private vehicle.

IV. BROCHURE OF LOS ANGELES: GEOGRAPHY, FABRICS, AND NETWORKS

From a structural point of view, Reyner Banham (2016) synthesizes the shape of the city of Los Angeles into three sets of elements: the residential ones, those set in the hills and the plain – which he calls "The hills" and "the Id plains", respectively; the infrastructural ones -the highways or, in his terminology. "Autopia"-, and the geographical ones, which are fundamentally present in the shape of a nature concentrated in the vision of the widespread Pacific Ocean, which Banham called "Surfurbia".

Geography

The Pacific – the territory of Surfurbia – substitutes in the Angeleno imaginary, the scenario of the countryside or nature which, in the day dreams of the first idealists that foresaw suburbia, surrounded the residential space (Rasmussen, 2010, p. 117), and it turned into the landscape that provided broad clear horizons that had characterized the actions of the first English landscapers (Hoskins, 1981, p 172-173). In Banham's vision, the Pacific provides the horizons and the sensation of freedom that the urban sprawl impedes: "From Malibu to Balboa, an almost continuous white sandy beach runs some one hundred and ten kilometers, almost all of them public access" (Banham, 2016, p. 31). The coastline is the place of Los Angeles that adopts the condition of universality of the public space (Banham, 2016, p. 33). In fact, a good part of the shoreline, from Playa del Rey, passing through El Segundo and Manhattan Beach, up to Hermosa Beach, enjoys something unusual in Los Angeles: it is closed to vehicles.

Residential fabric

However, in reality and mostly, Los Angeles is incomprehensible from the pedestrian point of view, because it is impossible to walk around it. Its size and homogeneity are discouraging and make it completely alien to the realm of pedestrians. An attempt to walk through Los Angeles is the opposite of the stroll of the artists of Romanticism, those that, in fact, invented this nonchalant means of transit (Jarvis, 1997). The landscape offered the poet or the painter, a continuous and organized, but also changing, sequence of elements that remained constantly stippled of singularities of a varied nature. The romantic walker could also look back, changing what they had already seen, to see it from a different perspective, or turning to the sides of the road to contemplate a new perspective. The supposed fictional Angeleno walker has before them a vast sea of infinite single-family cookie cut homes, a tedious spectacle that goes on and on. These are the Id plains. It is a paradoxical DNA, as it means that the character of the city is determined by a lack of character: "in what refers to the most basic and charmless, but vital, impulses of the urban psychology of Los Angeles, the plains are in fact the central core of the Id of the city" (Banham, 2016, p. 165). Los Angeles could even be considered as the first large scale test of what Koolhaas (2007) has called The Generic City (Figure 4). The plain is "everywhere and nowhere" (Banham, 2016, p. 176). Furthermore, in Los Angeles the paradox appears that even standout architecture – that abounds on the hillsides, the coastline, and in buildings associated to the highway – ends up being equally tedious due to their repetition and does not constitute any singularity to which one can be visually or emotionally linked to improve the legibility of the complex (Lynch, 2001, p. 34). The hills offer the most edifying spectacle of the views over the Pacific, and of some sophisticated dwellings, often built by the most renowned architects of the time – like the Case Studyhouse 22 (Figure 5) -, but the truth is that a pedestrian who dared to follow the windy path of a road climbing the slopes would find a landscape of fences and hedges (Banham, 2016, p. 99) that hide the famous homes and the views towards a Pacific Ocean, which becomes a reserved and exclusive spectacle for the elite who live in the area.

EL PASEO IMPOSIBLE POR LA CIUDAD INABARCABLE,
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ISSN 0717 - 3997 / 0718 - 3607

Figure 4. The plains of Id, Los Angeles, California. Source: Photograph of Alex S. Maclean (2003, p. 49).
Figure 5. Case Study house 22 of Pierre Koenig. Source: Photograph of Julius Shulman (Banham, 2016, p. 229)

The infrastructure networks

From the view of the pedestrian, the city is in fact incomprehensible. The vision of the whole is only possible by taking a step back far enough to be able to understand the dwellings as a large mosaic. And this view is only possible from the air, or from the incredible height that these immediate highway junctions (Figure 6), so praised by Banham (2016, p. 83-85), provide. For David Brodsly (1981, p.2), the network of highways of the Los Angeles metropolitan area is comparable to mountain chains and river systems, that is to say, the highway network has a practically geographical scale, and represents the most important trait of the landscape built by human being, "however, beneath this large scale, structure and identity seem really hard to identify" (Lynch, 2001, p. 41). As Banham says himself "those who are incapable of easily moving through their diffuse urban fabric (…) will never completely understand the city" (2016, p. 14). By moving with ease, he means, of course, by car. The many details that build the landscape turn any trip into an intense and enriching experience, even though the details we can perceive by walking along monotonously similar single-family homes is a tedious experience. The accelerated rhythm of the car makes one lose focus of those irrelevant details, and offers a landscape close the vision of abstract expressionist, that of a Jackson Pollock painting for example, where the effect of the whole prevails, while the detail is completely banal and lacks interest. The best way Los Angeles is perceived, is behind the wheel.

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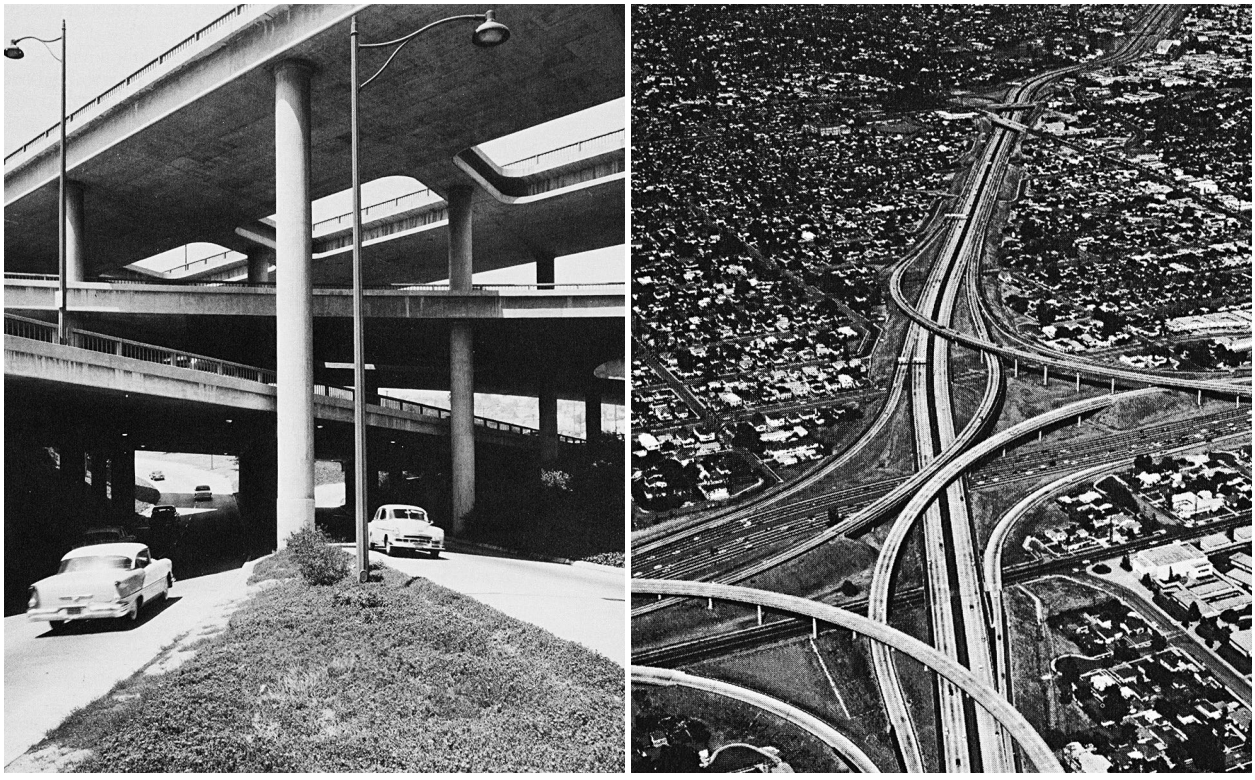

Figure 6. The junction between the Santa Ana and Harbor freeways (left) and the crossing of the Santa Monica Freeway with the San Diego freeway (right). Source: Left: Photograph by Dick Whittington (Brodsly, 1981, p. 118). Right: Photograph from the California Division of Highways (Banham, 2016, p 89).

V. STRUCTURE AND PERCEPTION

While the difference between the two characteristic fabrics of the city, that of the plains and the hills, operates at a morphological scale, the most important role that the highway plays in Los Angeles occurs at a metropolitan scale. As Brodsly (1981, p. 51) rightly states, the highway network "is a great urban synecdoche, one of the few parts capable of representing the whole" **3**. In the Angeleno metropolis, the residential enclaves live completely away from one another. The element that ties them with the whole is the highway. Without it, each suburb is an island completely disconnected from the rest. Following Brodsly, "in a suburban sprawl and of hundreds of randomly connected settlements, the highway brings up the sensation of clarity and precision useful to define and integrate the urban space. It has generated a new awareness of place" **4** (1981, p. 23).

At a structural scale, the highway network works are an authentic binding that allows tying infinite pieces spread over a very wide territory. Before the popularization of GPS, any indication in Los Angeles had to be linked to a reference of an access to the closest highway. This means of orientation is key for any driver who does not want to get lost, because "getting lost in Los Angeles means not being able to get on the highway or not knowing where to turn to leave one" **5** (Brodsly, 1981, p. 24). Reyner Banham (2016, p. 11-12) begins his text on Los Angeles by praising "A Guide to Architecture in Southern California", by David Gebhard and Robert Winter, and in particular, its maps, which are certainly very simple layouts that reflect the quality described by Brodsly. In the layouts of the guide, the architecture they propose visiting is located in different residential areas of Los Angeles, and to get there, the nearest highway is always referenced (Figure 7).

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EL PASEO IMPOSIBLE POR LA CIUDAD INABARCABLE,
UNA RELECTURA DE LAS ECOLOGÍAS URBANAS DE REYNER BANHAM
JAVIER MALO DE MOLINA BODELÓN
REVISTA URBANO Nº 44 / NOVIEMBRE 2021 - ABRIL 2022
PÁG. 8 - 19
ISSN 0717 - 3997 / 0718 - 3607

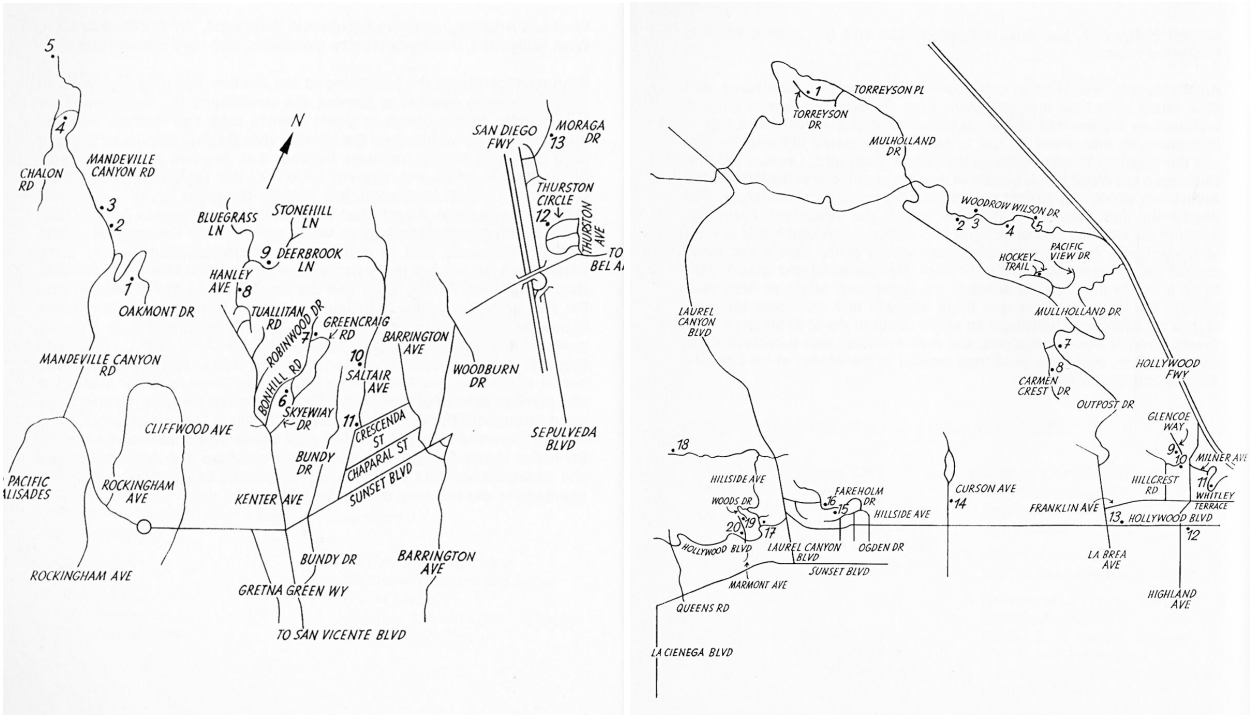

Figure 7. Two layouts of Gebhard and Winter's guide. Source: Left: Gebhard & Winter (1965, p. 30). Right: Gebhard & Winter (1965, p. 46).

These diagrams are an expression of the abstract condition of the territory of Los Angeles, a territory where highways are elements that provide the minimum essential structure that allows acquiring the notion of place (Gebhard & Winter, 1985, p. 9).

However, the authentic nature of the highway is determined by a mechanistic willingness that has reduced the traditional notion of street – a place for walking, buying, meeting, circulation – exclusively to its vehicle role. The highway is a street that been stripped from all the roles that it had traditionally been entrusted with, except the movement of a vehicle:

> (…) the highway represents the absolute subversion of this traditional sanctuary of the public domain that is the street. Through a tenth of their daily life, the average inhabitant of Los Angeles sits in a private universe encapsulated in steel. More than any other ecology of Los Angeles, more than any other specific place that is identifiable as such, the highway is a private space **6** (Brodsly, 1981, p. 46)

As a place -or as an ecology according to the term used by Reyner Banham (2016, p. 215-227)-, the highway only exists turned upon itself, rejecting any experience that is not related to driving. For Brodsly, it is like a tunnel, a space that is indifferent to the environment it crosses, only occasionally connecting with the urban space (1981, p. 38). This paradoxical condition leads the highway, on one hand, to interconnect the city more profoundly, but, on the other, to generate an enveloping space that complicates links between different parts of the city, and also between itself and a good part of its immediate surroundings. As a single-function road, it reinforces that idea that the different parts of the city are seen as mere passthroughs, while one reaches a concrete destination (Brodsly, 1981, p. 38). Driving along a metropolitan highway is not a trip, it is not enjoying the unforeseen details of the road, or experiencing contact with others. Meanwhile, it is worth remembering that it was from these unforeseen events, and above all, from the outside contact that the first bourgeois fled, to abandon the compact city to create the suburb (Fishman, 1987, p. 38). And it is in this sense that both the highway and the single-family home have triumphed as habitats that repel the daily and continuous contact between human beings, and above

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EL PASEO IMPOSIBLE POR LA CIUDAD INABARCABLE,
UNA RELECTURA DE LAS ECOLOGÍAS URBANAS DE REYNER BANHAM
JAVIER MALO DE MOLINA BODELÓN
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 8 - 19
ISSN 0717 - 3997 / 0718 - 3607

Figure 8. Junction over East Los Angeles. Source: Photograph of CALTRANS (Brodsly, 1981, p. 30).

all, among people of different social and economic levels. According to Brodsly "one can cross the poorest parts of the city without having to ever directly face poverty" **7** (1981, p. 38). The junction of East Los Angeles is located at the edge of the largest Latin American neighborhood of the city, but most drivers that cross it never leave the highway to head into what they surely consider a hostile territory (Figure 8). For the urban middle classes, the highway constitutes a bridge over the accidents of social geography (Brodsly, 1981, p. 40).

The romantic poets especially enjoyed the findings along the road, be it a leafy grove, a waterfall, or the spire of a distant church jutting out on the horizon. On the highway, one only has to focus on the signs that indicate directions or exits. The English romantic poet, William Wordsworth, transformed the people he met during his long walks into human archetypes – the hermit, the girl, the mother, the old man – from which he showed traits of the human condition in which his readers could see themselves as part of a fraternal whole (Sánchez, 2018, p. 28). The poetry of the highway and the suburb is that of loneliness and self-absorption, a condition that, though also potentially universal, leaves the human being with nothing more than narcissistically enjoying themselves, without fostering any other relationships.

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EL PASEO IMPOSIBLE POR LA CIUDAD INABARCABLE,
UNA RELECTURA DE LAS ECOLOGÍAS URBANAS DE REYNER BANHAM
JAVIER MALO DE MOLINA BODELÓN
REVISTA URBANO Nº 44 / NOVIEMBRE 2021 - ABRIL 2022
PÁG. 8 - 19
ISSN 0717 - 3997 / 0718 - 3607

The heroine of a Joan Didion novel – *Play it as it Lays* (2017) – drives along the highways of Los Angeles to escape the existential crisis caused by the flight of her husband. For this character, the highway is a specific and important place of her life, a place where she feels as the owner of her destiny; she is the queen of an impenetrable fortress, safe from the enemies and challenges of collective life. It represents a metaphoric return to the castle from which, according to Rebecca Solnit, the English had left at the end of the Middle Ages to discover and transform the landscape in a long process that peaked during Romanticism (2015, p. 132-133). Although the highway is a collective infrastructure, the experience of its use is completely private and practically individual. While the walks of the romantic poets let them connect with the geographical and cultural landscape once again, driving has taken us back to self-absorption. One that is also fruitless in intellectual or sensitive terms, but rather is revealed to be quite a banal experience. In Pynchon's novel, *The Crying of Lot 49*, the highway -reinforcing this idea of analgesic self-absorption – becomes a bloodstream injected with a narcotic that limits vital anxiety:

> Oedipa resolved to pull in at the next motel she saw, however ugly, stillness and four walls having at some point become preferable to this illusion of speed, freedom, wind in your hair, unreeling landscape it wasn't. What the road really was, she fancied, was this hypodermic needle, inserted somewhere ahead into the vein of a freeway, a vein nourishing the mainliner L.A., keeping it happy, coherent, protected from pain, or whatever passes, with a city, for pain (1994, p. 26).

The incredible apparatus this infrastructure called a highway, works almost as an enclosed underground tunnel, and the encapsulation that this suspension of reality generates has at least two levels of depth, although, of course, both completely elude the surroundings. On one hand, the driver must always stay alert to follow the traffic signs; on the other, the driver on their normal commute – from home to work – is capable of abstracting and thinking of something else. However, this kind of meditation space delves into the breaking of links between the person and their surroundings, exactly the opposite of what the Romantic poets intended – as Jarvis indicates (1997, ix)– with their approach to this setting through their walks. In these, there would also be moments that made it possible to transcend what they had in front of them, because upon entering the landscape, they sought to move away to find a space of individual reflection – away from the noise and collective anger they found amid the compact city-, but only after having profoundly experienced the complexity and intensity of the surrounding reality. Joan Didion aptly states this in a documentary (Dunne, 2017), when she speaks about the life of the character in her novel *Play it as it Lays*: "What happens to Maria in this book, is that she assumes that the experience makes no sense. It is that which everybody in Los Angeles has to end up basically accepting, because nothing seems to make any sense".

The encapsulation that the car and the highway offer, represents one more step in the individual self-absorption process described by Sennett (2002) in *The Fall of Public Man*. For him, the crowded environment of the industrial city, full of strangers –as expressly described by Edgar Allan Poe (2011) in his short story *The Man of the Crowd*– offered an alibi for the isolation of an ever more meager family unit. In the suburban setting of the single-family home, the family turns more to itself, emerging as a personal space of expression protected from the outside world (Sennett, 2002, p. 331). In Los Angeles, the car becomes one more step on this individual self-absorption: that of the individual estranged from their own family, who they have distanced themselves from, and isolated in their car, driving along the highway, is capable of comfortably showing who they are, although now not before anyone else, recognizing themselves only in the rear view mirror. Sennett (2002, p. 246-247) says that the philosopher Jean-Jacques Rousseau was the first one to realize about the disappearance of the public space –as a space of community representation where the citizen would be an actor who codifies human behavior and presents it to the rest– and its substitution for a life that is more inward to oneself; a life, for Rousseau (2009, p. 74-75) that is more genuine, but for Sennett (2002, p. 247), one that is clearly emptier and more sterile.

The paradox of the highway is the following: it is space where many people can come together, a space, however, that exacerbates up to unsuspected limits, that anonymous condition that surprised the artistic avant-garde when they experienced it for the first time in the industrial city (Azúa, 1999, p. 38-40). The masses of passersby that walked together without knowing one another or exchanging anything along the urban avenues, drive now equally crammed together, but even more isolated from one another by the metropolitan highways. Thus, the car is presented as a kind of sanctuary for individuality, totally disconnected from the rest of the congeners and from any surrounding, a landscape that fosters the alienation of the human being. In a car on the highway, the driver is really a king of his castle. In this way, the aforementioned metaphoric return to the castle occurs where, according to Solinit (2015, p.132-133), Medieval inhabitants still lived isolated from a surrounding that terrified them and against which they felt helpless. After colonizing and domesticating the landscape, the bourgeoisie sought to isolate themselves from a setting which, once again, they felt as hostile "Protected by a single-family home and

EL PASEO IMPOSIBLE POR LA CIUDAD INABARCABLE,
UNA RELECTURA DE LAS ECOLOGÍAS URBANAS DE REYNER BANHAM
JAVIER MALO DE MOLINA BODELÓN
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 8 - 19
ISSN 0717 - 3997 / 0718 - 3607

their own car, the Los Angeles inhabitant can live their daily life almost completely outside any intrusion"**8** (Brodsly, 1981, p. 45).

Paradoxically, while the person progressively isolates themselves from their immediate surroundings, at the same time they facilitate the intrusion of an exaggerated and distorted reality into their home, through the T.V. and the digital media and, in their car, through the radio. At the same time, they annul their connection with the closest reality, they perceive the more distant world with intensity. However, they do so through the media, entertainment and advertisement, which make them an ever more passive, albeit aggressive, spectator of *The Society of the Spectacle* (Debord, 2012), which has eliminated direct contact from their life, which, at the same time, allowed them to develop a more profoundly sensitive and critical awareness (Gehl, 2006, p. 29).

VI. CONCLUSIONS

This article has revised the book of Reyner Banham, framing it in the morphological perspective in which the author himself inserted it when he summarized its shape into four pieces –the coast, the highway network, and its two main fabrics-; and although today it may seem evident, the analytical effort that the English critic made is among his greatest contributions, because it provides a theoretical framework to the study of the shape of a city which then, and as has already been seen, was a sort of enigma. Second, the paper has added to the discussion the jump in scale that Banham did not do –on remaining all the time behind the wheel of his car– to propose a view that allows adding new perspectives that contribute to understanding Los Angeles, and from which it is possible to build a critique that transcends excessive optimism –which sometimes emanates from the text of Banham- towards a metropolis which, in fact, delves into the loneliness of a person, isolated from the type of collective experience that was traditionally given in the public space the compact city offered. In New York, in the 1960's, for example, Jane Jacobs still managed to put the almost exclusively structural vision of Robert Moses up against the ropes, stating and detailing the qualities that she had seen in her walks through Manhattan, where she lived (Flint, 2011, p. xv-xvi). Surely a book like that of Jacobs (2011) is necessary, not on Los Angeles in particular anymore, but about suburbia in general; a view that, from the optic that emphasizes the sensitive experience of the city, is capable of attracting the complexity and diversity that this seems to lack.

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EL PASEO IMPOSIBLE POR LA CIUDAD INABARCABLE,
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MERCADO 9 DE OCTUBRE Y MERCADO 10 DE AGOSTO
ADRIANA BRIONES ORELLANA, JESSICA HERAS OLALLA, VERÓNICA HERAS BARROS
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PÁG. 20 - 33
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SOCIAL AND URBAN TRANSFORMATIONS OF THE SURROUNDINGS OF STREET MARKETS LOCATED IN THE HISTORIC HUB OF CUENCA[1]

''9 DE OCTUBRE'' AND '' 10 DE AGOSTO'' MARKETSO

TRANSFORMACIONES SOCIALES Y URBANAS DEL ENTORNO DE LOS MERCADOS DEL CENTRO HISTÓRICO DE CUENCA MERCADO 9 DE OCTUBRE Y MERCADO 10 DE AGOSTO

ADRIANA BRIONES ORELLANA 2
JESSICA HERAS OLALLA 3
VERÓNICA HERAS BARROS 4

1 Trabajo desarrollado en el marco de la tesis de pregrado titulada “Transformaciones urbanas y sociales de los últimos 50 años del entorno inmediato de los mercados del centro histórico de Cuenca. Mercado 9 de Octubre - Mercado 10 de Agosto”, desarrollada en la Universidad de Azuay, Ecuador.

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Los mercados son equipamientos públicos que vinculan actividades comerciales y de intercambio cultural, los cuales interactúan con el tejido urbano en el que se insertan. Sus valores históricos y simbólicos los vuelven lugares susceptibles a transformaciones que replantean la estructura urbana, tal como sucede en el entorno inmediato de los mercados 9 de Octubre y 10 de Agosto, ubicados en el centro histórico de Cuenca, Ecuador, donde se han desencadenado procesos de gentrificación, turistificación y gentrificación comercial. En este contexto, se propone aquí analizar las transformaciones urbanas y sociales de los últimos 50 años, utilizando una metodología mixta con un enfoque exploratorio, mediante la observación, encuestas y entrevistas. En ambos casos de estudio, los resultados evidenciaron que, tras el funcionamiento de los centros de abasto, se incrementó la actividad comercial en los respectivos sectores, lo cual, junto con otras problemáticas asociadas (inseguridad, insalubridad, comercio informal), constituye un detonante principal del desplazamiento paulatino de la población.

Palabras clave: Mercado histórico, uso de suelo, gentrificación, turistificación, gentrificación comercial.

Street markets are public facilities that link commercial activities and cultural exchange, which interact with the urban fabric that they are a part of. Their historical and symbolic values make them vulnerable to transformations that rethink the urban structure, as happens in the immediate surroundings of the “9 de Octubre” and “10 de Agosto” street markets, located in the historic hub of the city of Cuenca, Ecuador, where processes of gentrification, touristification, and commercial gentrification have taken place. In this context, the proposal here is to analyze the urban and social transformations of the last 50 years, using a mixed methodology with an exploratory approach, through observation, surveys, and interviews. In both case studies, the results showed that with the operation of these street markets, commercial activity increased in the respective areas which, together with other associated issues (insecurity, unhealthy conditions, informal trade), are the main triggers for the incremental displacement of the population.

Keywords: Historic street market, land use, gentrification, touristification, commercial gentrification.

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I. INTRODUCTION

Scholars from the urban-architectural and social science areas highlight the importance of supply centers in the city, as these are public spaces where commercial activities and socio-cultural exchange take place (Medina, 2013). Street markets located in historic hubs give an identity to the neighborhood, given their high historic and symbolic value. However, their deterioration and decline are factors that have made them places of interest to make urban architectural interventions governed by neoliberal policies, that seek to re-qualify their facilities and their setting, triggering different social transformation processes that have led to demographic changes (Lacarrieu, 2016; Salinas, 2016; Delgadillo, 2016). This has been seen in the case studies in Europe and Latin America, which are described below.

In Madrid, Spain, the San Antón and La Boquería street markets experienced interventions that led to a restructuring of social classes and relations, which had repercussions on the commercial activities of the neighborhood, and meant the loss of the markets' traditional role, converting them into places for an upper class population, a process known as commercial gentrification (Salinas, 2016). In the case of La Boquería, Barcelona, the modernization of the market led to changes in land use after the implementation of services like hotels and restaurants, generating a touristification process (Hernández Cordero, 2017).

In the Latin American context, specifically in Argentina, the gentrification processes in the Abasto Market were analyzed, located in areas characterized by commercial activity, and by a lower-middle class population, which on being replaced by a mall, led to the socio-spatial segregation and fragmentation of the neighborhood (Boldrini & Malizia, 2014).

Unlike the previous examples, in Mexico, the Roma market was built, a building created under the "popular market" label, which, since it entered operation, caused gentrification in the sector (Cordero & Salinas, 2017). Likewise, the strong impact of supply centers can be seen in the Central Market in Concepción, Chile, where the lack of building maintenance, among other factors, displaced the storekeepers. However, the architectural intervention of this site could lead to gentrification processes (Zazo & López, 2018).

These cases show that the urban transformations carried out in these supply centers, mostly by private investors, satisfy the needs of the higher socioeconomic classes, and favor tourism. These processes of gentrification and touristification have been the causal agents of the restructuring of the social fabric. It is also shown that the markets change the dynamics of the sectors, including increasing the commercial activity around them.

The case of Cuenca is not far from this reality. Although studies have been made on the historic hub related to gentrification and touristification, these have not focused on popular amenities like supply markets. As such, this research takes, as case studies, the "9 de Octubre" (M9O) and "10 de Agosto" (M10A) markets, on being the most representative and traditional of the city. In addition, these supply centers and their surroundings have gone through urban transformation processes because of their state of decline. However, in their surroundings, there are still problems associated to insecurity and crime (Citizen Security Council, 2017).

Based on this context, the urban transformations that have been triggers for the social mutations in the immediate surroundings of the markets of the historic hub of Cuenca are sought to be known, under the premise that markets are causing changes in land use, on favoring an increase in commercial activity. This is added to the urban transformation processes that have taken place in these facilities and their surroundings, which have led to different social dynamics related to demographic changes, touristification, and gentrification processes.

II. THEORETICAL FRAMEWORK

Markets are popular economic institutions that, more than just being supply centers, play an important role in the construction of the city. For this reason, they must not be understood as a unit that operates in isolation, but rather as a cell that interacts with the urban fabric they are inserted within (Zazo & López, 2018).

These supply centers are also susceptible to urban transformations that can be analyzed from two approaches. First, from the social setting, where the variation in activities of the users has repercussions on changes of land use, which mainly vary from housing to trade. The second approach is related to the physical-spatial changes of the city as a result of their obsolescence, which is why renewal or revitalization interventions are required (Triviño, 2010). It is important to point out that urban transformation entails interventions, restoration, rehabilitation, recovery, and renewal processes, generating important functional and social changes (Hernández, 2014).

On the other hand, the social transformations comprise several lines of research, such as globalization, gentrification, segregation; dynamics which often arise from urban transformation processes (Guevara, 2015). In the same way, social transformations have an impact on the living conditions of the people (habitat, housing, employment, services, safety, etc.) and change the power relationships among the social groups (Rebollo, 2012).

Figure 1. 9 de Octubre Market (M9O). Source: Preparation by the Authors.

Hence, it is clear that urban and social transformations are closely tied to one another, which can be seen in the aforementioned case studies, that have experienced processes like gentrification, defined as the substitution of the original population for a new one, belonging to higher socioeconomic levels (Domínguez, 2017). Commercial gentrification, understood as a process that occurs within the market, is also patently clear. This has displaced the traditional merchants as a result of implementing the gourmet market model (Cordero & Salinas, 2017).

Meanwhile, touristification is defined as a type of gentrification that transfigures neighborhoods, replacing the traditional uses for places that are exclusively set up for tourists, with a corporate entertainment offer (Delgadillo, 2019). It is important to understand the focus of this type of transformations within the markets. In this sense, touristification is conceived as a transformation of the consumption patterns, where the tourist is the main consumer (Hernández Cordero, 2017).

III. CASE STUDY

There are three supply markets located in the historic hub of Cuenca, Ecuador: "9 de Octubre", "10 de Agosto", and "3 de Noviembre". The first two were chosen for this study, on being the oldest and most traditional ones of the city, as well as for being located in areas with the highest crime rates in the historic hub.

M9O (Figure 1), located in the El Sagrario parish, was the first supply center in the city, and was built in 1930 to satisfy the need of solving the health and supply issues in San Francisco Square (the first street market). The commercial activity of the market gradually changed the land use around it which, along with the growth of informal trade towards the Civic Square and the surrounding streets, caused health and safety problems. This panorama reflected the need for recovering the public space and returning vitality of the sector, which led to the retrofitting of the market and the nearby squares, to be reopened in 2009 (Illustrious Municipality of Cuenca, 2009).

Years later, in 1953, the M10A market was built (Figure 2), located in the Gil Ramírez Dávalos parish. Although it became the heart of the neighborhood, its deterioration led the area to become a troublesome and unsafe place. For this reason, in 2004 remodeling works took place, that created an interior patio and an atrium towards Calle Larga (Junta de Andalucía, 2007). It is worth highlighting that the market remodeling project was part of the New City urban regeneration policy, within the World Heritage declaration given to the city of Cuenca (Mancero, 2011).

TRANSFORMACIONES SOCIALES Y URBANAS DEL ENTORNO DE LOS MERCADOS DEL CENTRO HISTÓRICO DE CUENCA
MERCADO 9 DE OCTUBRE Y MERCADO 10 DE AGOSTO
ADRIANA BRIONES ORELLANA, JESSICA HERAS OLALLA, VERÓNICA HERAS BARROS
REVISTA URBANO Nº 44 / NOVIEMBRE 2021 - ABRIL 2022
PÁG. 20 - 33
ISSN 0717 - 3997 / 0718 - 3607

Figure 2. 10 de Agosto Market (M10A). Source: Preparation by the Authors.

Figure 3. Location of the case studies (M9O and M10A) and architectural interventions. Source: Preparation by the Authors.

"9 DE OCTUBRE" MARKET		
Transformation	**Place**	**Description**
Intervention	Tranvia line (2017)	Pedestrianization of Gaspar Sanguirima, Mariscal Lamar, and Vargas Machuca streets. Treatment of the floors.
Restoration	"9 de Octubre" Market (2009)	Implementation of shopping stands. Creation of three levels, with centralized circulation and underground parking. Improvement of the roof. Conservation of the façade. (Arquitectura Panamericana, February 27th, 2018)
Rehabilitation	Civic Square (2009)	Recovery of public space. Incorporation of street furniture, lights, and vegetation in plant pots.
	Hermano Miguel Square (2010)	Implementation of street furniture. Treatment of the floors.
Renewal	Rotary Square (2009)	Redistribution of the square, optimizing the space. Implementation of 96 shopping stands, street furniture, and vegetation. Incorporation of 3 mini-squares, that connect with the Rotary passageway and the civic square. Treatment and leveling of the floors. (Arquitectura Panamericana, January 25th, 2018)
"10 DE AGOSTO" MARKET		
Rehabilitation	"10 de Agosto" Market (2004)	Extension of the market. Generation of public space. Changes in the market's façade (Junta de Andalucia, 2007)
	Bajada del Padrón (2007)	Generation of open, continuous spaces, without obstacles. Implementation of urban furniture, vegetation, lighting. (Boris Albornoz-Arquitectura, no date)
	Casas del Nogal (2017)	The use of the space was intensified with the building a housing block. Creation of gardens. Private project (ARQA, 2018)
Renewal	San Francisco Square (2018)	Recovery of the public space, freeing up the central area of the square. Reorganization and improvement of the shopping stands. Implementation of vegetation in plant pots. Treatment and leveling of floors.

Table 1. Physical-spatial transformations around M9O and M10A. Source: Preparation by the Authors. Concepts from the study, "Theoretically addressing urban renewal as a transformation process in the urban structure" (Hernández, 2014).

Urban transformation projects were also made in the immediate surroundings of these facilities, at different scales, aiming at handling the associated problems these had (Table 1). Here lies the importance of analyzing the impact these projects have had in these areas, which is why the study area is limited by the blocks that immediately surround M9O and M10A, as can be seen in Figure 3.

The table above shows the different physical-spatial transformations gradually made to the public spaces in the immediate surroundings of the M9O and M10 markets. It is also seen that there are private housing projects that affect the surroundings they are inserted within.

TRANSFORMACIONES SOCIALES Y URBANAS DEL ENTORNO DE LOS MERCADOS DEL CENTRO HISTÓRICO DE CUENCA
MERCADO 9 DE OCTUBRE Y MERCADO 10 DE AGOSTO
ADRIANA BRIONES ORELLANA, JESSICA HERAS OLALLA, VERÓNICA HERAS BARROS
REVISTA URBANO Nº 44 / JUNIO 2021 - NOVIEMBRE 2021
PÁG. 20 - 33
ISSN 0717 - 3997 / 0718 - 3607

TRANSFORMACIONES SOCIALES Y URBANAS DEL ENTORNO DE LOS MERCADOS DEL CENTRO HISTÓRICO DE CUENCA
MERCADO 9 DE OCTUBRE Y MERCADO 10 DE AGOSTO
ADRIANA BRIONES ORELLANA, JESSICA HERAS OLALLA, VERÓNICA HERAS BARROS
REVISTA URBANO Nº 44 / NOVIEMBRE 2021 - ABRIL 2022
PÁG. 20 - 33
ISSN 0717 - 3997 / 0718 - 3607

IV. METHODOLOGY

To study the urban and social transformations experienced by the blocks of the immediate surroundings of M9O and M10A, an exploratory and mixed approach methodology was used, that combines analysis of qualitative and quantitative data, collected through observation, interviews, and surveys.

The study of urban transformations, related to changes in land use, was done in three stages. First, through interviews with key players, the historic uses of the study area were determined, corresponding to 1970. Second, data was collected from 2010 by the University of Cuenca and the World Heritage City – WHC project. Third, in 2020, information on the land use was obtained through observation, by using maps made in the QGis 4.10 program. The land use was categorized for this research, following the Municipal Ordinance of the Canton of Cuenca, 2003, where the following uses are set out: housing; commercial; mixed use; services; production; amenities [5]; unoccupied property; unbuilt lot; and commercial-service.

To get to know the socioeconomic level of the current inhabitants, the qualification of parameters related to the characteristics of the dwelling, the level of finished studies, and the occupation of the head of household, as well as the income and possession of goods, were analyzed and interpreted, based on the Socioeconomic Level Stratification Survey of the National Institute of Statistics and Censuses [INEC, Spanish] (2011), to adapt these considering the information obtained in the surveys applied in this study. Thus, the current population was categorized into the following classes: high (A); high middle (B); middle (C+); low middle (C-); and low (D). The surveys were also applied to the consumers of the markets, in order to know their socioeconomic situation and the place they came from.

Sadly, on not having broken down the census information available, regarding the Socioeconomic Level Stratification Survey of 1990, 2001, and 2010, this could not be compared with the current data, but it was possible to infer trends related to this aspect through the information on the number of vulnerable and not vulnerable homes in each case study, provided by the INEC. This information was analyzed on two scales: first, at a block level in 2001 and 2010; and then, at an area level, taking the periods of 1990, 2001, and 2010 (bearing in mind that there was no broken down census information available from 1990, either). It is worth highlighting that, although the data was collected at the end of 2019 and the beginning of 2020, these were not affected by the Covid-19 health emergency.

To define the sample of the surveys, a population projection was made for 2020, adding together the population of the blocks in the immediate surroundings of M9O and M10A, obtained from the censuses of 2001 and 2010 and, by using a Simple Random Sampling, a final size of 70 individuals was obtained. The surveys were distributed between both case studies, while for the users of the markets, tourists or local, a sampling by convenience method was applied, with a total of 31 surveys in each one of the markets.

In the case of the interviews, key players were chosen, who have greater affinity and a certain degree of power within the study area (Cimas, 2015). Among these, representatives of the markets, neighborhood presidents, and inhabitants who had lived for over 20 years in the neighborhood were chosen, to know the reasons for the displacement of the people, and the main conflicts in each case study. The number of interviews made was based on the saturation of categories, and a total of 14 interviewees was defined.

V. RESULTS

The qualitative data was analyzed inductively in the Atlas-ti program (test version), while the quantitative analysis was done in the SPSS Statistics Subscription program, version 25.0, to cross check the variables. The results related to the demographic analysis will be presented below, followed by the changes in land use, the main associated conflicts, and finally, the socioeconomic level of the inhabitants and consumers.

Population dimension

The decreasing population in the case studies, at a block level, shows a reduction of 39.40% in the adjoining areas of M9O, and of 46.25% in M10A. However, these percentages increase when compared at an area level, with 51.85% in El Sagrario and 63.96% in Gil Ramírez Dávalos, as show in Figure 4.

Land use dimension

This research shows that the population decrease is related to the land use changes that have gradually taken place since 1970. According to the interviewees,

5 Facilities: considers uses of a cultural, educational, religious, health, social assistance, supply, public safety, administration and management, sports and leisure, and social organization nature.

TRANSFORMACIONES SOCIALES Y URBANAS DEL ENTORNO DE LOS MERCADOS DEL CENTRO HISTÓRICO DE CUENCA
MERCADO 9 DE OCTUBRE Y MERCADO 10 DE AGOSTO
ADRIANA BRIONES ORELLANA, JESSICA HERAS OLALLA, VERÓNICA HERAS BARROS
REVISTA URBANO Nº 44 / JUNIO 2021 - NOVIEMBRE 2021
PÁG. 20 - 33
ISSN 0717 - 3997 / 0718 - 3607

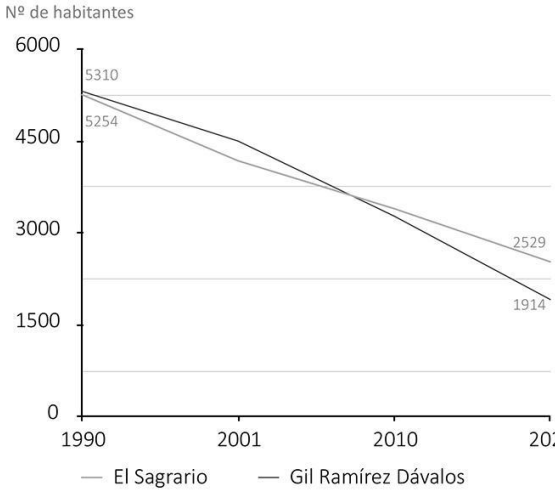

Figure 4. Population decrease at an area level (1990-2020). Source: Preparation by the authors based on the INEC Database.

Figure 5. Land use, 1970. Source: Preparation by the Authors.

TRANSFORMACIONES SOCIALES Y URBANAS DEL ENTORNO DE LOS MERCADOS DEL CENTRO HISTÓRICO DE CUENCA
MERCADO 9 DE OCTUBRE Y MERCADO 10 DE AGOSTO
ADRIANA BRIONES ORELLANA, JESSICA HERAS OLALLA, VERÓNICA HERAS BARROS
REVISTA URBANO Nº 44 / NOVIEMBRE 2021 - ABRIL 2022
PÁG. 20 - 33
ISSN 0717 - 3997 / 0718 - 3607

"10 DE AGOSTO" MARKET				
Land use	2010		2020	
	%	m2	%	m2
Housing	4.87	2,140.18	3.35	1,443.07
Commercial	7.58	3,329.31	29.27	12,605.20
Mixed use	50.38	22,126.30	39.32	16,927.12
Services (financial, food, professionals, and tourism)	7.54	3,312.19	6.76	2,912.15
Production	0.0	0	0.00	0
Facilities	23.88	10,489.71	18.67	8,041.62
Unoccupied property	5.75	2,523.20	2.63	1,132.79
Unbuilt lots	0,0	0	0.00	0.00
TOTAL	100	43,920.89	100	43,061.95

Table 2. Comparison in the percentages of land use (2010-2020). Source: Preparation by the Authors using the World Heritage City project (2015).

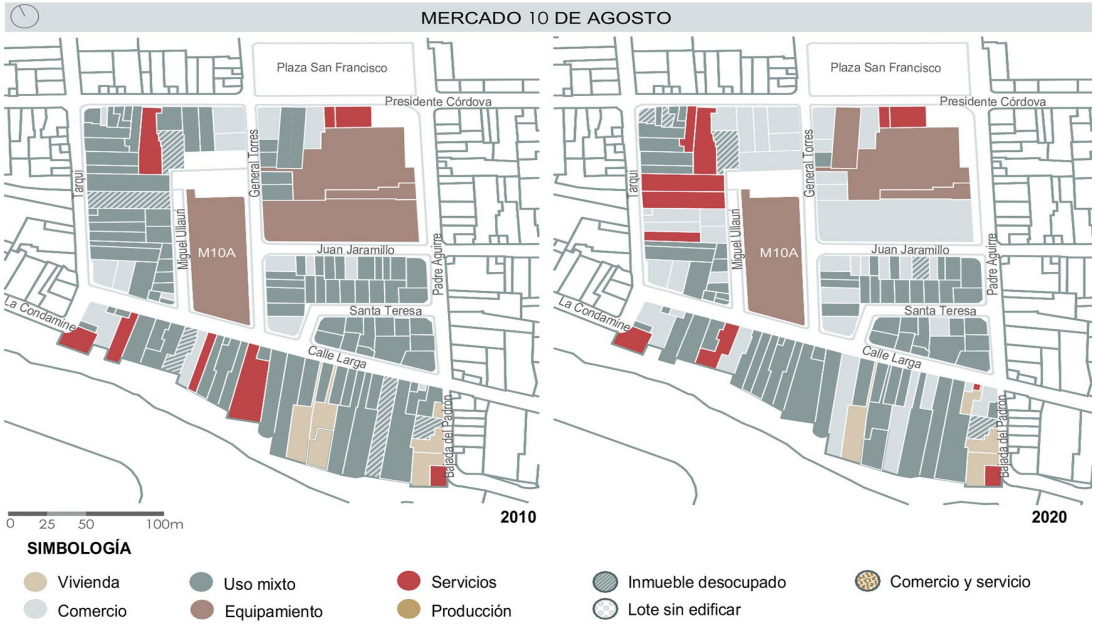

Figure 6. Land use 2010-2020. Source: Preparation by the Authors.

TRANSFORMACIONES SOCIALES Y URBANAS DEL ENTORNO DE LOS MERCADOS DEL CENTRO HISTÓRICO DE CUENCA
MERCADO 9 DE OCTUBRE Y MERCADO 10 DE AGOSTO
ADRIANA BRIONES ORELLANA, JESSICA HERAS OLALLA, VERÓNICA HERAS BARROS
REVISTA URBANO Nº 44 / JUNIO 2021 - NOVIEMBRE 2021
PÁG. 20 - 33
ISSN 0717 - 3997 / 0718 - 3607

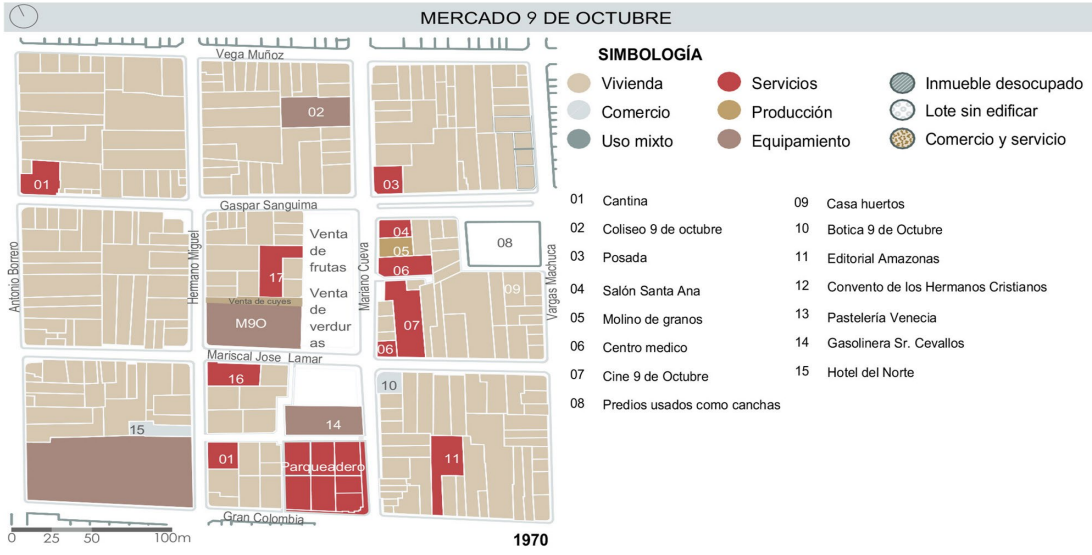

Figure 7. Land uses in 1970. Source: Preparation by the Authors.

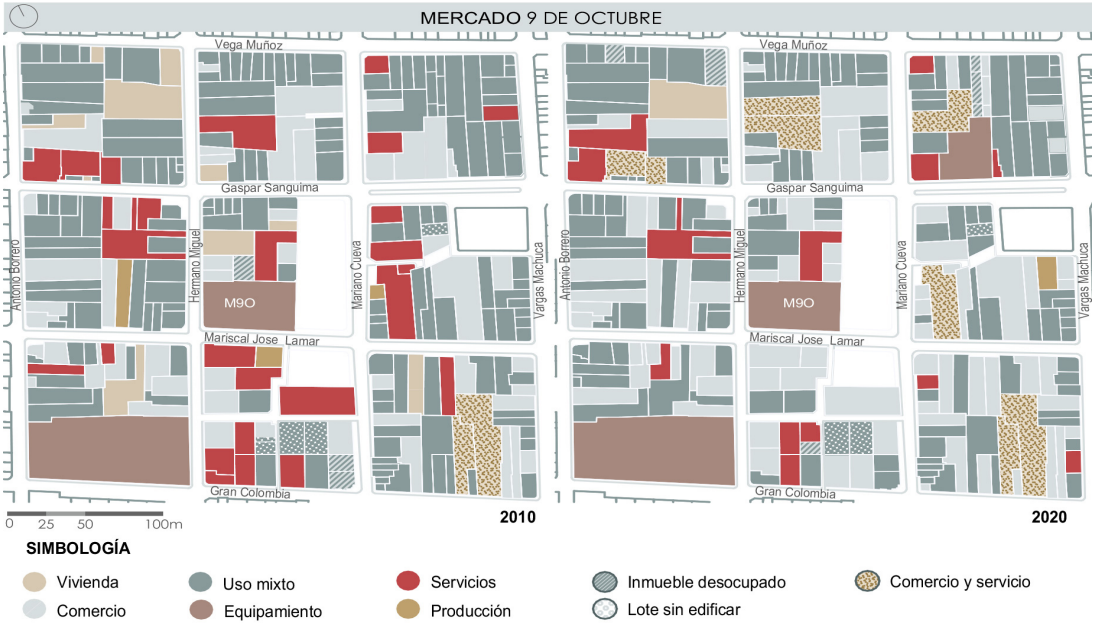

Figure 8. Land use – 2010-2020. Source: Preparation by the Authors.

TRANSFORMACIONES SOCIALES Y URBANAS DEL ENTORNO DE LOS MERCADOS DEL CENTRO HISTÓRICO DE CUENCA
MERCADO 9 DE OCTUBRE Y MERCADO 10 DE AGOSTO
ADRIANA BRIONES ORELLANA, JESSICA HERAS OLALLA, VERÓNICA HERAS BARROS
REVISTA URBANO Nº 44 / NOVIEMBRE 2021 - ABRIL 2022
PÁG. 20 - 33
ISSN 0717 - 3997 / 0718 - 3607

"9 DE OCTUBRE" MARKET				
Land use	2010		2020	
	%	m2	%	m2
Housing	5.11	4,435.11	1.63	1,374.08
Commercial	25.11	21,807.31	39.18	33,129.16
Mixed use	44.32	38,488.79	39.96	33,787.80
Services (financial, food, professionals, and tourism)	13.91	12,076.17	6.30	5,330.99
Production	1.00	871.67	0.39	327.30
Facilities	8.44	7,326.33	10.22	8,634.15
Unoccupied property	0.81	699.18	1.19	1,009.13
Unbuilt lots	1.30	1,134.60	1.13	959.23
TOTAL	100	86,839.16	100	84,551.84

Table 3. Comparison of land use percentages (2010-2020). Source: Preparation by the Authors.

"9 DE OCTUBRE" MARKET			
Users	Rural Parish	Urban Parish	Tourists
Low Middle (C-)	9.68%	6.45%	3.23%
Middle (C+)	19.35%	32.26%	12.90%
High Middle (B)	3.23%	3.23%	6.45%
High (A)	0.00%	0.00%	3.23%
"10 DE AGOSTO" MARKET			
Users	Rural Parish	Urban Parish	Tourists
Low Middle (C-)	3.03%	6.06%	0.00%
Middle (C+)	12.12%	30.30%	6.06%
High Middle (B)	0.00%	3.03%	33.33%
High (A)	0.00%	0.00%	6.06%

Table 4. Socioeconomic level of the users of the markets. Source: Preparation by the Authors.

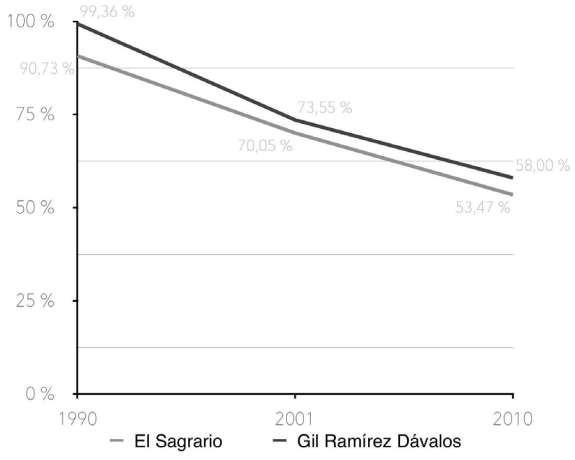

Figure 9. Poverty at an area level (1990-2010). Source: Preparation by the authors based on the INEC Database.

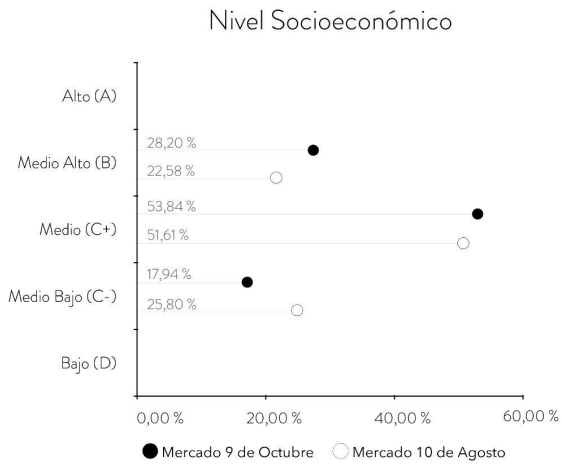

Figure 10. Socioeconomic level of the inhabitants at a block level. Source: Preparation by the Authors.

residential use dominated the area around M10A at that time, as can be seen in Figure 5.

On the other hand, in the last decade (Figure 6) a 1.52% decrease in housing, an 11.08% fall in mixed use, and a 21.69% rise in commercial use are seen, as shown in Table 2. These changes are perceived by the inhabitants, as some of those interviewed state that: "you'll see, it's practically a commercial street" (B.D.)

A similar panorama is also seen around M9O. Up until 1970, housing, traditional stores, and places for the inhabitants of the sector to meet prevailed. These uses have been mapped in Figure 7.

In the surroundings of this market, in the 2010-2020 period, commercial use has increased by 14.07%, showing a reduction in residential use (Table 3). These data are confirmed by several of the interviewees who, for example, comment that "this position has been consolidated on being more than a residential neighborhood, rather a commercial one" (M.C.), as shown in Figure 8.

A predominance of mixed used is seen in both cases, although many of the properties that preserve their infrastructure have been converted into stores and warehouses. These changes of land use are a consequence of the commercial dynamic arisen in the immediate surroundings of the facilities in question.

In particular, in the "9 de Octubre" neighborhood, the creation of the market with the same name led to a notorious increase in the commercial activity of the sector, leading to inter-provincial transport companies setting up around it, along with hotels and hostels (Illustrious Municipality of Cuenca, 2009). As the years have gone by, these places have become brothels, leading to the proliferation of prostitution, a problem that persists today and that affects habitability conditions, as some of the inhabitants commented: "what you see now is full of sales, trash, full of junkies, drunks and all that" (R.M.) Likewise, the surveys show that 71.79% of the inhabitants and 63.33% of the consumers, both domestic and foreign, consider that the safety conditions must be improved in the sector.

Alongside this, in the surroundings of M10A, around 50 years ago, bars led to an insecure feeling in the area, which today has triggered conflicts like drug addiction, alcoholism, environmental contamination, and a high level of traffic. Despite the interventions made in the sector, there is discontent among the residents, like H. R. confirms: "the neighborhood is ugly, neglected, dirty […] people are looking for quieter places to live, away from so much noise, traffic, that are safer […], here there's drugs, alcoholism […]; there's no space to meet up". In this aspect, the surveys revealed that 57.58% of the consumers, and 67.74% of the inhabitants, consider that insalubrity is the main conflict in this case study.

Socioeconomic dimension

Regarding the socioeconomic level, the analysis of the data showed that, at an area level, in the El Sagrario parish (M9O), the number of homes from 1990 to 2010 has fallen 58.00%, while in Gil Ramírez Dávalos (M10A), vulnerable homes have fallen 53.47%, as can be seen in Figure 9.

As was explained above, in the section dedicated to methodology, regarding vulnerable homes in the blocks around M9O and M10A, from 2001 to 2010, a fall of 5.23% and 27.05% respectively, is seen.

TRANSFORMACIONES SOCIALES Y URBANAS DEL ENTORNO DE LOS MERCADOS DEL CENTRO HISTÓRICO DE CUENCA
MERCADO 9 DE OCTUBRE Y MERCADO 10 DE AGOSTO
ADRIANA BRIONES ORELLANA, JESSICA HERAS OLALLA, VERÓNICA HERAS BARROS
REVISTA URBANO Nº 44 / JUNIO 2021 - NOVIEMBRE 2021
PÁG. 20 - 33
ISSN 0717 - 3997 / 0718 - 3607

The surveys showed that more than half the inhabitants are from the middle class (C+), while no inhabitants are part of the high socioeconomic level (A), as shown in Figure 10.

On the other hand, the study shows that M10A has a greater flow of tourists and people from the urban parishes, compared with M9O, where the percentage of tourists is lower. Regarding the socioeconomic level, these tourists belong to the high (A) class, unlike the local consumers, who are from the middle (C+) and low middle (C-) classes (Table 4).

VI. DISCUSSION

From the analysis made to M9O (El Sagrario) and M10A (Gil Ramírez Dávalos), the impact that this type of facility generates on its surroundings could be seen, confirming the theory that markets are elements that do not work in isolation from their context, but that rather have an integrated relationship with the space (Zazo & López, 2018). From this perspective, it is also corroborated that the changes in land use, mainly from the increase in commercial activity, alongside the main conflicts (unhealthiness and insecurity) present in the facilities and their surroundings, have led to the gradual displacement of the inhabitants of both areas of Cuenca.

The aforementioned European and Latin American research projects show that the interventions were mainly focused on satisfying the needs of users with a greater purchasing power, unlike the remodeling projects in M9O and M10A, which were done under inclusive policies that have sought to guarantee the permanence of the popular sectors in the historic hub of Cuenca (Mancero, 2011). However, the idea of attracting a greater number of users, and of improving the purchasing experience, could change the consumption patterns of these facilities, triggering commercial gentrification processes. This is what one of the market administrators implies: "We are looking for the markets to have another ambiance, that the purchasing experience is different, that the citizen feels it is a safe place […] we have all the facilities to become just another Shopping Center or Mall **6**" (F.G.)

There are places in the immediate surroundings of the case studies that have gone through physical-spatial transformations (Table 1) which, as has been mentioned, affect the living conditions of the inhabitants. In addition, on being located in the historic heritage area, these transformations have had a touristic approach. In this sense, there are studies in the city of Cuenca that confirm that the interventions have been done to improve the urban historic landscape, which has resulted in a city that has become attractive for cultural tourism (Cabrera & Bernal, 2020).

Changes like the incorporation of the Cuenca Tram System, and the pedestrianization of the streets around M9O, caused problems for the inhabitants and the closure of some businesses. However, the neighborhood representative considered this as an opportunity for the reactivation of trade through tourism, which is why a possible touristification of the sector is foreseen.

Finally, the results obtained regarding the socioeconomic level of the sectors show that, in both case studies, the number of vulnerable homes has considerably dropped between 1990 and 2010. This has happened, in part, due to the implementation of housing projects that have exclusively targeted people with a higher purchasing power, alongside the large number of tourists who visit the markets, who come from higher socioeconomic levels than those of the local consumers (users). In this way, the start of gentrification and touristification processes is evidenced.

VII. CONCLUSIONS

Based on the analysis of markets in their historic contexts, and on the results obtained in this research, the importance of understanding social transformation processes like gentrification, touristification, and commercial gentrification from a multiscale perspective is undeniable. This can favor taking actions to face the significant changes around these facilities, from the urban transformation processes that involve the eviction of the original population. In fact, the research presented here reveals that the demographic changes in the immediate surroundings of M9O and M10A are directly related to the increase of commercial activity, and the main conflicts associated to these popular shops (insecurity, unhealthiness, informal trade).

In this way, the great problem seen in these case studies, which has become the fundamental trigger of the social transformations, has been left clear. Although urban transformations seeking to re-qualify the markets and their surroundings have taken place, under inclusive policies that do not clear the vulnerable sectors, these projects have focused on promoting commercial uses that benefit tourism, privileging the high-income socioeconomic classes.

This scenario reflects the close ties there are between the supply centers and their surroundings. The markets analyzed, on being located in the historic heritage hub of

6 Mall del Río and Coral Centro: Shopping Center / Hypermarkets.

Cuenca, are facing a setting that is undergoing gentrification and touristification processes that could lead to social transformations within these facilities, the opposite of the cases studied in the international context, where the market triggered these processes in their surroundings.

Ultimately, after seeing the social transformations caused by the urban changes in the markets and their surroundings, it is advisable to reevaluate and analyze the approach of projects that seek to revitalize popular commercial hubs and their adjoining areas, initiatives that, due to their commercial and economic nature, have displaced the traditional inhabitants and jeopardized the immaterial heritage these traditional supply centers embody.

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QUALITY OF THE URBAN ENVIRONMENT AND THE PERCEPTION OF SAFETY FOR WOMEN[1]

COMPARISON BETWEEN TWO NEIGHBORHOODS IN CUENCA, ECUADOR

CALIDAD DEL ENTORNO URBANO Y PERCEPCIÓN DE SEGURIDAD DE LAS MUJERES
COMPARACIÓN DE DOS BARRIOS DE CUENCA, ECUADOR

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REVISTA URBANO Nº 44 / NOVIEMBRE 2021 -ABRIL 2022
PÁG. 34 - 45
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1 Este trabajo ha sido desarrollado en el marco de la investigación de tesis de pregrado titulada “Influencia de la calidad urbana del espacio público en la percepción de seguridad de las mujeres. Ciudadela Eucaliptos y urbanización Río Sol”, en la Universidad de Azuay, Ecuador.

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La mayoría de ciudades han sido planificadas y construidas en base a un sujeto universal: un hombre, sano, con trabajo remunerado y de mediana edad. Como resultado, las ciudades se han convertido en un entorno que visibiliza las desigualdades sociales, dado que obstaculizan el desarrollo de la vida cotidiana de los grupos más vulnerables. Entre estos grupos se encuentran las mujeres. En este contexto, el siguiente artículo busca exponer los resultados de un estudio que tuvo por objetivo conocer la influencia de la calidad del entorno urbano en la percepción de seguridad de las mujeres en dos barrios, con diferente índice de calidad de vida, de la ciudad intermedia de Cuenca, Ecuador. Se tomaron como casos de estudio los barrios Río Sol, cuyo índice de calidad de vida es de los más altos de la ciudad, y la Ciudadela Los Eucaliptos que, a pesar de estar a tan solo 500m del anterior, tiene un índice de calidad de vida medio-bajo. Metodológicamente, se aplicaron tres herramientas: e-MAPS, para conocer la calidad del entorno urbano de los dos barrios; una adaptación del Diagnóstico Urbano con perspectiva de Género “DUG” para medir la percepción de seguridad de las mujeres; y la observación no participante. Los resultados mostraron que existen diferencias en el índice de la calidad del entorno urbano entre los dos barrios, pero que este no está directamente relacionado con la percepción de seguridad. La observación no participante sugiere que existen otros factores que componen la vida de barrio que inciden en la percepción de seguridad de las mujeres.

Palabras clave: Diseño urbano, espacio público, mujeres, seguridad, barrios.

Most cities have been planned and built based on a universal subject: a male, healthy, paid, and middle-aged worker. As a result, cities have become an environment that makes social inequalities visible as they hinder the daily lives of the most vulnerable groups. Among these groups are women. In this context, this research looks to present the results of a study that aimed at determining the influence of the quality of the urban environment on the perception of safety for women in two neighborhoods, with different quality of life indices, in the intermediate city of Cuenca, Ecuador. The case studies were the Rio Sol neighborhood, whose quality of life index is one of the highest in the city, and Ciudadela Los Eucaliptos, which, despite being only 500m from the previous one, has a medium-low quality of life index. Methodologically, 3 tools were applied: e-MAPS, to determine the urban quality of the two neighborhoods; an adaptation of the Urban Diagnosis with a Gender Perspective (DUG, in Spanish), to measure the safety perception of women; and non-participant observation. The results showed there are differences in the urban environment quality index between the two neighborhoods, but that these are not directly related to the perception of safety. Non-participant observation suggests that there are other factors that make up neighborhood life, that affect women’s perception of safety.

Keywords: Urban design, public space, women, safety, neighborhoods.

REVISTA URBANO Nº 44 / NOVIEMBRE 2021 - ABRIL 2022
PÁG. 34 - 45
ISSN 0717 - 3997 / 0718 - 3607

REVISTA URBANO Nº 44 / NOVIEMBRE 2021 -ABRIL 2022
PAG. 34 - 45
ISSN 0717 - 3997 / 0718 - 3607

I. INTRODUCTION

The purpose of this article is analyzing the relationship between the quality of the urban environment and the perception of safety for women. For this, two neighborhoods of the intermediate city of Cuenca, in Ecuador, which record different quality of life indexes, were taken as case studies.

The issue arises in a context where it is has been seen that the city, and in particular its public space, is not neutral. That is to say, it has different implications depending on the gender of its citizens. The right to the city, understood as a right to urban life, to freedom, to the individualization in socialization, to the habitat, and to inhabit (Lefebvre, 1978), has been restricted to just one kind of subject: a healthy, salaried, middle-aged man. Within the factors that limit the appropriation of the public space by all male and female users, one that stands out most is the perception of safety. This is because, for women, there are specific fears, like the fear of sexual violence, the fear of being attacked, and the fear of road safety due to excessive traffic (Santiso, 2000).

Although the United Nations General Assembly approved the elimination of all forms of discrimination against women in 1979, the rights of women were only included in the New Urban Agenda in 2016, which suggests that there is a lack of depth and knowledge on this issue. In recent years, approaches have been made that take on the concern for women and their relationship with the public space through urbanism from a gender perspective, understanding this as an urbanism that needs to act on all scales (Sánchez de Madariaga, Gregorio Hurtado & Novella Abril, 2016). As an example, UN Women has outlined the development of the "Safe Cities and Safe Public Spaces" program (2017), whereby 27 cities have collected updated data on violence and insecurity in cities, to create future action models, and to promote safer cities for girls and women (UN Women, 2017). However, these projects generally take place in large metropolis, so there is the need to look further into the subject in intermediate cities. Intermediate cities promote a "balanced sustainable regional development", and also more than half of the global urban population lives under this city model (United Nations [UN], 2016, p. 1). For this reason, they constitute ideal scenarios for research and proposals for public policies and improvement strategies.

In Latin America, "the gender equality agenda has been strengthened by converging the domestic agendas on each scale, in particular with social and feminist movements that demand equality and non-discrimination" (Allen, Cárdenas, Pereyra & Sagaris, 2019, p. 24). However, there is still much to do in the region, one that is characterized on having high levels of economic and social inequality. In Ecuador, for example, 65 out of every 100 women state they have been victims of violence in any of its forms in their life. Specifically in Cuenca, in 2019, 725 cases of sex-crimes were reported (Citizen Security Council, 2019). These numbers, although official, do not show the real numbers. Just as Tapia (2021) states, a large percentage of crimes are not reported.

This research project was made within this context, analyzing the relationship between the quality of the urban environment of two neighborhoods with different quality of life indexes in the city of Cuenca, Ecuador, as well as the perception of safety for the women living there. The article starts by reviewing the specialized literature and providing an explanation of the methodology, through a description of the neighborhoods studied and the instruments used: a geo-spatial revision of the quality of the urban environment, an audit of the perception of safety for women, and a non-participant observation. Finally, a discussion based on data triangulation is presented, to explore the relationship between the quality of the urban public space, and the perception of safety for women in the analyzed neighborhoods.

II. THEORETICAL FRAMEWORK

In recent decades, concerted efforts have been made to study and analyze the urban quality of the public space, bearing in mind that this allows collective gathering, social interaction, and participation among citizens (Carrión, 2010), but that, despite being "reclaimed and occupied by the citizens is, above all, a space defined from power" (Egizabal, 2019, p- 229). In parallel, "urban quality" is understood as the wellbeing of people in their daily activities, based on the quality of the environment they live in (von Wirth, Grêt-Regamey & Stauffacher, 2015). Ewing and Clemente (2013) assert that the quality of the urban environment is defined by different subjective characteristics that affect the user's perception when using a specific space: capacity of image, human scale, transparency, safety, order, and complexity.

One of the variables that conditions the use of the public space the most is the perception of safety, with "a feeling of anxiety and danger on facing the possibility of being a victim of crime" (Bjornstrom & Ralston, 2014, p. 9). For Avendaño (2006), often fear is not based on "real events and data", but rather, on occasions, it is defined by the perception of an area. In this regard, several studies have been made that analyze the relationship of the perception of safety with the quality of the urban environment (Frank *et al*., 2010; Valenzuela, 2016). The study of Valenzuela (2016) suggests that the perception of safety does not solely depend on the built environment, but also on the urban dynamics (land uses, presence of people, among others).

Figure 1. Map of living conditions. Source: Osorio & Orellana (2014, p. 33).

Likewise, it has been shown that the perception of safety in public spaces is related to the gender of people (Rashid, Wahab & Rani, 2019; Ciocoletto & Col.lectiu Punt 6, 2017; Diaz, 1989). For women, using public spaces entails fear of sexual violence and of being attacked (Santiso, 2000), which forces them to always be vigilant; hence, this limits their use and enjoyment, and conditions their movements in terms of times and areas. Some authors have called this "fear spaces" for "those which women perceive as more hostile or where they are more prone to suffer aggression" (Egizabal, 2019, p. 220), whether these are defined as such because of objective or subjective reasons. According to the author, in the former it is easier to act because their characteristics are evident, but it is in the latter where the intervention becomes complicated. Generally, spaces with a diversity of users and a greater presence of people increase the perception of safety for women (Rashid *et al*., 2019; Ciocoletto & Col.lectiu Punt 6, 2017; Jacobs, 1973; Amat, Cardona, Goula & Saldaña, 2015).

Within Latin America, the studies made by Rainero (2009) in several cities find a vicious circle: the socioeconomic level of neighborhoods conditions the characteristics of the place where women live and, particularly, the streets they walk along. These become some of the determining factors for the "appropriation of the city by women" (Rainero, 2009, p. 169), and that the lower urban quality of the neighborhoods is related "almost directly to their greater perceptions of fear in them and, as a result, with lower ranges of use of the city" (p- 169). Falú (2014) asserts that violence is a core daily life problem to develop women's rights over the city.

III. METHODOLOGY

Case Studies

The study was carried out in two neighborhoods of the intermediate city of Cuenca, in Ecuador. The city is located to the south of the Ecuadorian Andes mountains, and has a population of approximately 600,000 inhabitants (including the rural and peri-urban areas). As an inclusion criterion, it was established that the chosen neighborhoods were located within the urban limits, as such, the Parish of Monay, on the banks of the Cuenca River, was chosen. When it comes to analyzing information about this parish, it was interesting to note the difference of the Living Conditions Index between the two neighborhoods: Ciudadela Los Eucaliptos and Río Sol. The former had an index of 0.73, and the latter, of 0.85 (Osorio & Orellana, 2014). These two neighborhoods were chosen as case studies for this reason

CALIDAD DEL ENTORNO URBANO Y PERCEPCIÓN DE SEGURIDAD DE LAS MUJERES
COMPARACIÓN DE DOS BARRIOS DE CUENCA, ECUADOR
SOFÍA PALACIOS JERVES, CARLA HERMIDA PALACIOS
REVISTA URBANO Nº 44 / NOVIEMBRE 2021 - ABRIL 2022
PÁG. 34 - 45
ISSN 0717 - 3997 / 0718 - 3607

REVISTA URBANO Nº 44 / NOVIEMBRE 2021 - ABRIL 2022
PAG. 34 - 45
ISSN 0717 - 3997 / 0718 - 3607

(Figure 1). Both are located on the banks of the Cuenca River, a sector that is mainly formed by houses, but that is surrounded by different facilities that complement it.

Instruments

This research used different instruments to study the quality variables of the urban environment and the perception of safety for women. Data collection was made using a mixed methodology with an explanatory sequential design (Creswell, 2013), and with a correlation and explanatory scope. The following instruments were used for this: a) e-MAPS to collate the quality of the urban environment; b) a survey to measure the perception of safety; and c) non-participant observation. The comparison of the quantitative results of the quality of the urban environment and the perception of safety for women was made using the application of Spearman's non-parametric correlation test. The articulation of the quantitative and qualitative results was made using methodological triangulation (Valencia & Mercedes, 2000).

e-MAPS

The quality of the urban environment in both neighborhoods was measured using an adaptation of the MAPS tool (Cain, Millstein & Geremia, 2013) in the city of Cuenca, namely the e-MAPS tool (Orellana, Quezada, Andino & Peralta, 2019. e-MAPS is a questionnaire comprising closed questions, that evaluates the quality of the urban environment considering pedestrians, by analyzing the following variables: route (land use; urban landscape, aesthetic); segment (highways and sidewalks); crossings (crossing signs and elements); and dead ends (ludic elements). The result of the analysis rates the quality of the urban environment in a range from 0 to 12, where 0 is the worst, and 12, the best. For this study, 51 segments of analysis were generated, each one with their respective questionnaires which rate the urban environment. The data collection was made during the first week of February, 2020, using the Kobo Toolbox tool (http://www.kobotoolbox.org), a free digital tool which can be accessed using mobile devices, where the results are exported to a ..csv file to display them in Qgis.

Safety Survey

To evaluate the perception of safety, an adaptation of the "Urban Diagnosis with Gender Perspective" Safety survey of Col.lectiu Punt 6 (Casanovas *et al*., 2014) was used, which was applied during the second week of February, 2020. This questionnaire analyzes spatial visibility, social visibility, information, and prohibited spaces using 14 questions asked to female residents and users of the sidewalks in both neighborhoods, aged between 18 and 60 (women responsible for their own mobility).

Each answer of the questionnaire is scored with 1 point, which allows getting to know the perception of safety for women in a range of 0 to 14, where 0 is the worst index of safety perception, and 14, the best. The study universe was 601 female inhabitants within the two neighborhoods (National Institute of Statistics and Censuses, 2010), and a total of 61 questionnaires were applied as a sample.

The sample used in the study was by convenience, that is to say, the questionnaire was applied to "the cases available that could be accessed" (Hernández, Fernández & Baptista, 2010, p. 401). Some women were directly recruited on the neighborhood's streets, who were asked to take part in the study. Other women were recruited through the "snowball" process, by reference from people who lived in the neighborhood. The snowball sampling was turned to as people in the Rio Sol Neighborhood do not walk in the public space. The remaining questionnaires were sent to residents and female users of the public space in the two neighborhoods by e-mail, to complete the sample.

Non-Participant Observation

Non-participant observation, where the researcher is limited to taking notes of events without having a relationship with the subjects from the setting involved (Campos & Lule, 2012, p. 53) was done during the third and fourth week of February, 2020. Each neighborhood was visited to record important situations that characterized the space, using notes and photographs. The visits were made during two time periods: first, in those hours where there is a greater movement of people on needing to commute (06.30-08:00 and 12:30-14:00); and second, at those times where movement is reduced (10:00-11:30 and 16:00-17:30). It was seen that there are 4 factors that affected the use of the public space by women: the meeting places, the variety of land uses, the elements that allow socializing, and the empty lots and blind points.

III. RESULTS

Urban environment quality results

The scores from the application of the e-MAPS tool allowed obtaining an urban environment quality index of both neighborhoods of the case study (Figure 2). The results of each segment have a score of 0 to 12, respectively, where 0 is the worst, and 12, the best. A statistical comparison was made between the means using the Mann Whitney U non-parametric statistical test for two independent samples, from which it was seen that there are significant differences (p-value<0.01) between the means of Ciudadela Los Eucaliptos and those of the Rio Sol Neighborhood (x1=0.71 and x2=4.42, respectively).

Figure 2 shows that the segments of the Rio Sol Neighborhood, whose quality of life index is the highest, have a better urban environment quality rating than the segments of Ciudadela Los Eucaliptos. Another piece of information that stands out is that most of the segments that have a middling urban environment

Figure 2. Urban environment quality results. Source: Preparation by the Authors.

quality index in Ciudadela Los Eucaliptos are those which restrict the entry of motorized vehicles. In the Rio Sol Neighborhood, the fact that stands out is that most of the segments which have a middling index are those that have green areas; and those with the best scores are those that have a safety buffer between the sidewalk and the street.

Female safety perception results

The results obtained using the adapted survey of Casanovas *et al.* (2014) allowed getting to know the perception of safety for women in Ciudadela Los Eucaliptos and in the Rio Sol Neighborhood, using a single index. Figure 3 shows the female safety perception index of female residents or users of the two neighborhoods: each circle represents a geo-referenced survey, and their color indicates the perception of safety. The safety perception range is set from 0 to 14, where 0 is the worst safety perception, and 14, the best. From this, a comparison was made of the mean female safety perception of both neighborhoods, using Mann Whitney's U non-parametric statistical model for two independent samples. It was noted that there are significant differences (p-value<0.01) between the means of Ciudadela Los Eucaliptos and the Rio Sol Neighborhood (x1=10.02 and x2=7.73, respectively). The result that was obtained was that the female safety perception index in the public space of the Ciudadela Los Eucaliptos neighborhood (whose living quality index is lower), is higher than that of the Rio Sol neighborhood.

The existence of the dependence hypothesis (statistically significant, p-value<0.01) between each question of the safety perception survey was tested using the Chi-squared test. 2 interesting relationships were found from the Independence test. The first significant one arose in the questions "Are there dark or abandoned spaces in this block?" and "Are there areas in the block where people do not walk?". With this data, it can be concluded that the presence of dark or abandoned spaces generates rejection among the female users, and they prefer to not walk close to them. The second significant relationship occurred with the questions, "Are there abandoned, wild spaces, or unbuilt lots in the block?" and "Is there any space in the block where domineering groups, delinquents or gangs meet?". This finding suggests that, when there are abandoned spaces, these are used for domineering groups, delinquents, or gangs to meet.

Correlation between the variables

The comparison of the urban environment quality data of both neighborhoods with the female safety perception data in the public space revealed that there is actually a statistically significant correlation between the two variables (p-value<0.01; rho=-0.36). However, this correlation is negative and not very strong. According to Figure 4, the behavior of both neighborhoods follows the

CALIDAD DEL ENTORNO URBANO Y PERCEPCIÓN DE SEGURIDAD DE LAS MUJERES
COMPARACIÓN DE DOS BARRIOS DE CUENCA, ECUADOR
SOFÍA PALACIOS JERVES, CARLA HERMIDA PALACIOS
REVISTA URBANO Nº 44 / NOVIEMBRE 2021 - ABRIL 2022
PÁG. 34 - 45
ISSN 0717 - 3997 / 0718 - 3607

CALIDAD DEL ENTORNO URBANO Y PERCEPCIÓN DE SEGURIDAD DE LAS MUJERES
COMPARACIÓN DE DOS BARRIOS DE CUENCA, ECUADOR
SOFÍA PALACIOS JERVES; CARLA HERMIDA PALACIOS
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 34 - 45
ISSN 0717 - 3997 / 0718 - 3607

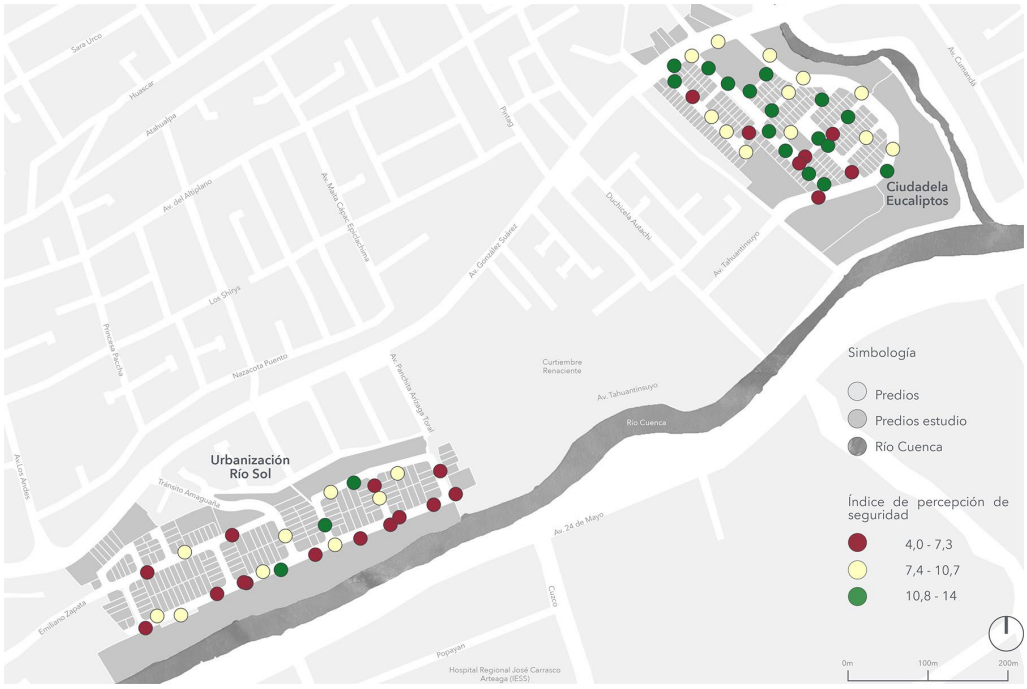

Figure 3. Safety perception results. Source: Preparation by the Authors.

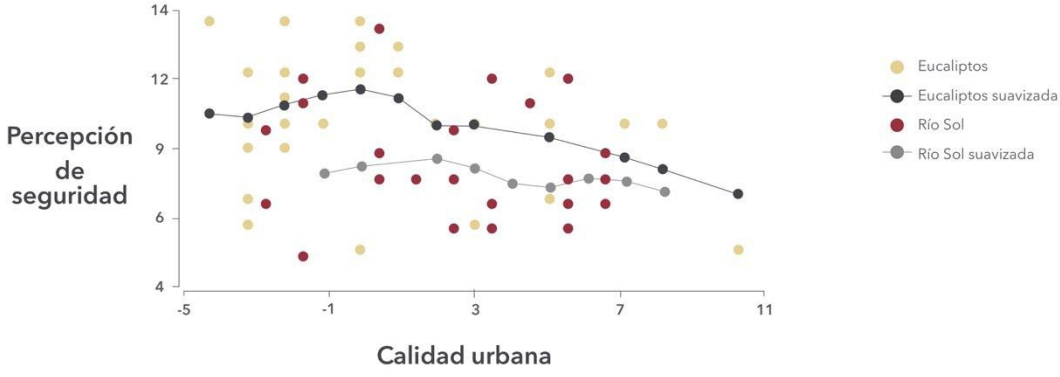

Figure 4. Scatter graph of the safety perception and urban environment quality of both neighborhoods. Source: Preparation by the Authors.

Figure 5. Meeting places map. Source. Preparation by the Authors.

same trend, although it is important to emphasize that Ciudadela Los Eucaliptos has a tendence curve above that of Rio Sol. This phenomenon indicates that the female safety perception in the public space of Ciudadela Los Eucaliptos is better than that in Rio Sol, despite the quality of the urban environment of the former having a better score than the latter.

Non-participant observation results

From the information collated during the non-participant observation, the existence of three factors that favor the use of the public space by women could be recognized in both neighborhoods, and one that, on the contrary, inhibits it.

The first factor is the presence of meeting places. As can be seen in Figure 5, there is a higher number of meeting places in Ciudadela Los Eucaliptos (the neighborhood with the highest safety perception index). In Rio Sol, only one meeting place was registered, which is the path shared with the river bank.

The second factor that can affect it, is the variety of land uses. Figure 6 shows that there is a greater variety of land uses in Ciudadela Los Eucaliptos: there is housing, small stores, health centers, educational centers, food points, among other shops; while in Rio Sol there is just one lot, which, apart from housing, sells food. This leads to the public space not having life, because there are no activities that invite people to circulate or to remain in the public space.

The third factor that has an influence on whether the public space of a neighborhood is used more than another one, by women, is the presence of physical elements like park benches, slopes, and playgrounds, that allow socializing. As can be seen in Figure 7, Ciudadela Los Eucaliptos has several of these facilities. An important feature of this neighborhood is its topography, as stairs and slopes have been built to connect the different levels of the area. The importance of these spaces is that, given their shape, they invite people to sit down, chat, rest, among other things. Rio Sol, on the contrary, does not have this type of elements. Despite there being several places for public use, their only purpose is to favor the landscape. This suggests that the green spaces of this neighborhood were planned to be seen from above, but not to generate activities onsite.

On the other hand, the presence of empty lots and blind points inhibit women from using the public space. Just as can be seen in Figure 8, the public space that is close to the banks of the rivers of both neighborhoods, largely comprises

CALIDAD DEL ENTORNO URBANO Y PERCEPCIÓN DE SEGURIDAD DE LAS MUJERES
COMPARACIÓN DE DOS BARRIOS DE CUENCA, ECUADOR
SOFÍA PALACIOS JERVES, CARLA HERMIDA PALACIOS
REVISTA URBANO Nº 44 / NOVIEMBRE 2021 - ABRIL 2022
PÁG. 34 - 45
ISSN 0717 - 3997 / 0718 - 3607

CALIDAD DEL ENTORNO URBANO Y PERCEPCIÓN DE SEGURIDAD DE LAS MUJERES
COMPARACIÓN DE DOS BARRIOS DE CUENCA, ECUADOR
SOFÍA PALACIOS JERVES, CARLA HERMIDA PALACIOS
REVISTA URBANO Nº 44 / NOVIEMBRE 2021 -ABRIL 2022
PÁG. 34 - 45
ISSN 0717 - 3997 / 0718 - 3607

Figure 6. Land use map. Source: Preparation by the Authors

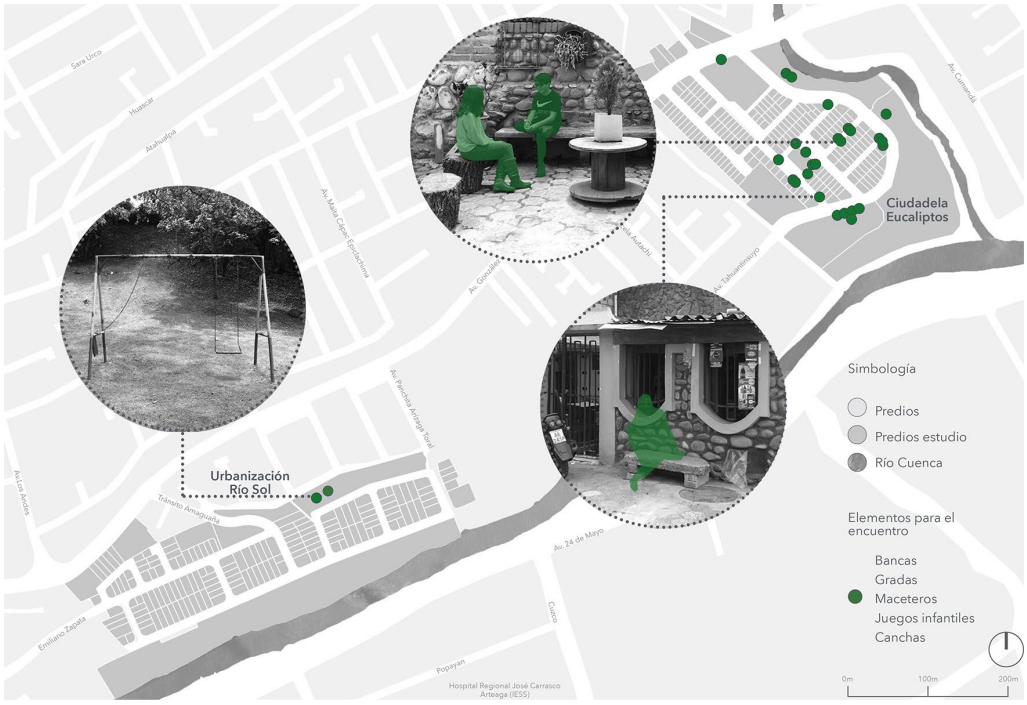

Figure 7. Map of elements for meeting. Source: Preparation by the Authors.

CALIDAD DEL ENTORNO URBANO Y PERCEPCIÓN DE SEGURIDAD DE LAS MUJERES
COMPARACIÓN DE DOS BARRIOS DE CUENCA, ECUADOR
SOFÍA PALACIOS JERVES, CARLA HERMIDA PALACIOS
REVISTA URBANO Nº 44 / NOVIEMBRE 2021 - ABRIL 2022
PÁG. 34 - 45
ISSN 0717 - 3997 / 0718 - 3607

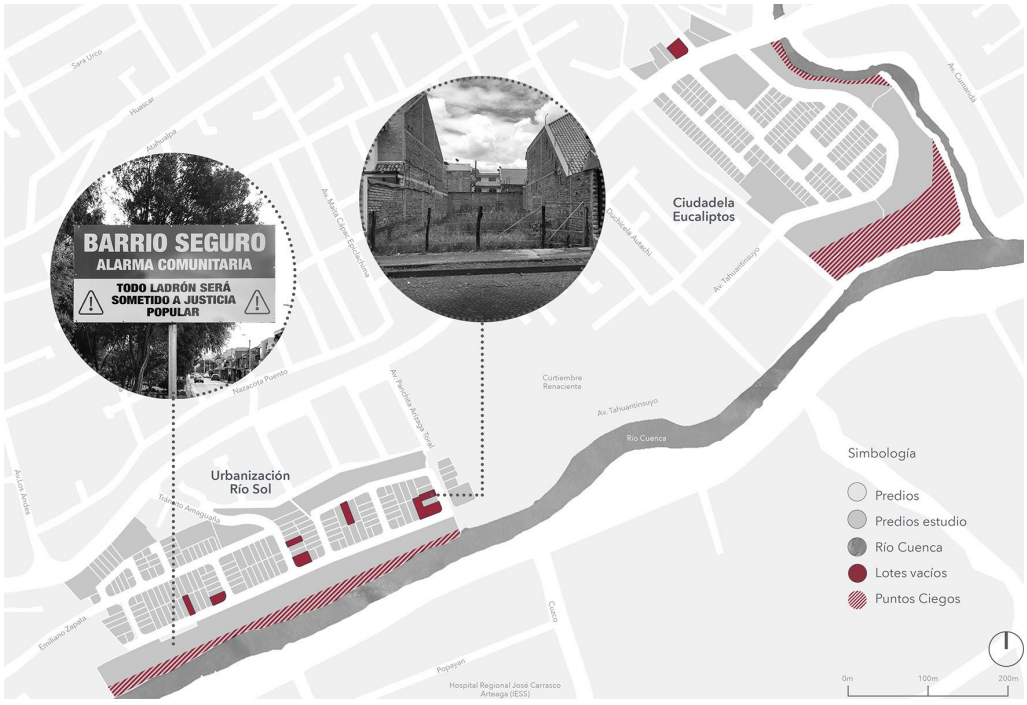

Figure 8. Map of empty lots and blind points. Source: Preparation by the Authors

blind points. Another aspect that can be seen is the presence of several empty lots in Rio Sol. These spaces mean that women will feel more insecure, as there are desolate sites where nobody goes.

IV. DISCUSSION

The results presented in the previous paragraphs allow reflecting about what the quality of the urban environment really implies. It is clear that this goes beyond the physical-spatial elements that can objectively be seen through tools like e-MAPS. Thus, it corroborates that stated by Ewing and Clemente (2013), when they state that the quality of the urban environment is defined by different subjective characteristics that affect user perception, and by Valenzuela (2016), who considers that the perception of safety depends both on the quality of the built environment, and the urban dynamics.

Thus, from the results obtained using the e-MAPS tool, it could be seen that the neighborhood which has a higher living quality index is Rio Sol, as it has a higher urban environment quality index (mean x=4.42) than Ciudadela Los Eucaliptos (mean x=0.71). Rio Sol has a higher urban environment quality index due to elements like vegetation, safety buffers, and signage.

However, Ciudadela Los Eucaliptos has a higher female safety perception index (mean x=10.02 compared to x=7.73 of Rio Sol), because the neighborhood has some features that improve the daily life of its residents and female users, such as: different land uses, spatial visibility, proximity to services and amenities, and meeting spaces. These results are in line with studies made previously by feminist groups that confirm that the perception of safety for women is directly related with the capacity to take over the space, and that, for this reason, the space must have visibility, clarity, alternative routes, a variety of land uses and activities, presence of different people, among other aspects (Casanovas *et al*., 2014). These also coincide with what Egizabal (2019) states: "changing the built environment of the "spaces of fear" would be just one step to avoid aggression and encourage women to move around freely" (p. 236-237), through which she emphasizes that intervening in the built environment is important, but it is not enough.

Just as the specialized literature states, one of the most relevant factors for making women feel safe when they are in the public space, is that there is a presence of people (Rashid *et al*. 2019). This is because the presence, short-stays, and circulation of people implies the presence of informal surveillance in the public space, which improves the perception of safety for citizens (Amat *et al*., 2015; Gehl, 2014). According to that revealed in this study, when there are several meeting places, with

elements that invite people to sit down and stay in the space, and also a diversity of uses as in Ciudadela Los Eucaliptos, women feel safer. In addition, the proximity to services and shops related to the houses are essential for women to carry out daily activities inclusively and effectively (Casanovas *et al*., 2014). Among the land uses, it is necessary to have a balance between residential use, third-party use, and leisure use, because this allows the neighbors to meet one another and to create neighborhood support networks. A clear example of this is found in Ciudadela Los Eucaliptos, where the neighborhood shops are key for the day-to-day life of the families that live there, because the ladies who work in these shops, known as the "vecis" or "neighbors", become the "eyes of the neighborhood".

Finally, as was mentioned before, statistical significance was obtained on cross checking the questions "Are there dark or abandoned spaces in this block?" and "Are there places in the block where people do not walk?", as well as the questions "Are they abandoned, wild spaces, or unbuilt lots in the block?" and "Is there any space in the blocks where the domineering groups, delinquents and gangs meet?". This finding leads to reflect about the importance of applying strategies to mitigate the existence of this type of spaces, as it coincides with what has been stated by other authors, like Filardo (2010), who says that a place can be considered as insecure when one group in particular uses a given space and takes it over, leading to the people who are not part of this group avoid using or even approaching it.

VII. CONCLUSIONS

Although the academic reflection on the perception of space from an inclusive perspective is an emerging issue, there are several studies that have approached it. As an example, in Latin America, the "Safe Cities" program (UN Women, 2017) has made great efforts to address the issue by collating data on violence and insecurity in the public space. However, generally these projects are done in the large metropolis of each country, which is why the need has arisen to look further into this issue in intermediate cities, to promote a sustainable and balanced development at a regional level, as it is in these where policies and practices can have an impact, in shorter periods, in the improvement of the perception of safety for women.

This study has sought to contribute in this sense, on considering the case of two neighborhoods in the intermediate city of Cuenca, Ecuador. It is shown that, in the case studies, female safety perception has no direct relationship with the quality of the urban environment, measured objectively using tools such as e-MAPS, and that, on the contrary, it is crossed by other aspects, like those related to being able to socialize with neighbors.

This project has opened new research questions. One of these aims at looking at the river banks from the safety point of view, as throughout the survey collection process, some residents would elaborate their answer, stating that the river bank is a threat. Likewise, in terms of gender, there are some challenges left outstanding for academia, such as research and reflection on the perception of safety in the public space for the LGBTQI community, and also in girls under 18 (as this research did not address female minors).

Studies like this show, once again, that the city is not neutral, that the same conditions do not govern for men and for women, which is why expanding upon urbanism with a specific approach for women, today continues to be a valid subject.

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CALIDAD DEL ENTORNO URBANO Y PERCEPCIÓN DE SEGURIDAD DE LAS MUJERES
COMPARACIÓN DE DOS BARRIOS DE CUENCA, ECUADOR
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GOVERNANCE OF INTERMEDIATE CITIES[1]

LESSONS FROM POST-DISASTER ACTION IN THE ACAPULCO METROPOLITAN AREA, MÉXICO

GOBERNANZA DE CIUDADES INTERMEDIAS APRENDIENDO DE ACCIONES POST-DESASTRE EN LA ZONA METROPOLITANA DE ACAPULCO, MÉXICO

GOBERNANZA DE CIUDADES INTERMEDIAS
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Este artículo analiza los patrones de gobernanza de la acción pública post-desastre realizada tras el paso de los huracanes Ingrid y Manuel en 2013, en Coyuca de Benítez -municipio que forma parte de la Zona Metropolitana de Acapulco, México-, buscando contribuir a expandir el conocimiento sobre los modos de gobernanza de las ciudades intermedias y, en particular, aquellos relacionados con la reducción del riesgo de desastre. Conceptualmente, se moviliza el concepto de gobernanza adaptativa para contrastar y reflexionar los patrones de gobernanza imperantes en Coyuca. Metodológicamente, este trabajo se basa en la sociología de la acción pública para analizar los procesos de reconstrucción de infraestructura, servicios públicos y vivienda a través de entrevistas, grupos focales y diversas fuentes escritas. El artículo argumenta que, a pesar de los esfuerzos de descentralización y democratización en las últimas décadas, los patrones de gobernanza son altamente centralizados y poco adaptativos, lo que limita el desarrollo de intervenciones participativas y articuladas que atiendan las necesidades cotidianas de las personas y que mejoren su calidad de vida; contexto en el cual, la acción pública más que reducir los riesgos de desastre ha incrementado y/o generado nuevos riesgos en territorios urbanos ya de por sí precarios y vulnerables. Asimismo, se pone en cuestión la relevancia de marcos conceptuales y normativos, como el de gobernanza adaptativa, para guiar cambios significativos, dada la distancia entre los patrones de gobernanza deseables y aquellos existentes en los territorios.

Palabras clave: Gobernanza, ciudades intermedias, política urbana, post-desastre, reconstrucción

This article analyses the governance patterns of post-disaster public action carried out after Hurricanes Ingrid and Manuel hit Coyuca de Benítez in 2013, a municipality that is part of the Metropolitan Area of Acapulco, Mexico, seeking to contribute towards broadening knowledge about the modes of governance of intermediate cities, and in particular, those related to disaster risk reduction. Conceptually, the concept of adaptive governance is presented to contrast and reflect on prevailing governance patterns in Coyuca. Methodologically speaking, this work is based on the sociology of public action, to analyse the reconstruction processes of infrastructure, public services, and housing, through interviews, focus groups, and diverse written sources. This paper argues that, despite the decentralization and democratization efforts of recent decades, governance patterns are highly centralized and not very adaptive, limiting the development of participatory and articulated interventions that meet people's daily needs and improve their quality of life. In this context, public action, rather than reducing disaster risks, has increased and/or generated new risks in already precarious and vulnerable urban territories. Along the same vein, this paper questions the relevance of regulatory and conceptual frameworks, such as adaptive governance, to guide significant changes, given the distance between ideal and existing governance patterns in the territories.

Keywords: Governance, intermediary cities, urban policy, post-disaster, reconstruction

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PÁG. 46 - 57
ISSN 0717 - 3997 / 0718 - 3607

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I. INTRODUCTION

Latin America and the Caribbean (LAC) is the second most exposed region in the world to natural threat associated disasters (United Nations Office for the Coordination of Humanitarian Affairs [OCHA], 2020), and are especially vulnerable to the effects of climate change (Marguilis, 2016). In this context, urban settlements with under a million inhabitants represent a specific challenge, given that it is expected that the urban population growth will be greater in this type of settlement in several regions, including LAC. These tend to be institutionally weak, and have limited capabilities to enact climate actions (Intergovernmental Panel on Climate Change [IPCC], 2014). Although the key role intermediate cities have at a local and regional level is well known, when performing roles of articulation and intermediation between different territories and spaces (Bellet & Llop, 2004), institutional autonomy and disaster risk reduction (DRR) related capacities are still pending issues.

Different studies have stated that, at least in the case of Mexico, the limited range of decentralization, combined with the institutional and administrative weaknesses of municipal governments, are essential in the management of the territories (Arellano, Cabrero, Montiel & Aguilar, 2011; Cabrero, 2005; Merino, 2001). In this way, the ways of governance, even though it has been sought to give greater autonomy to local governments as part of a general State reform started in the 90's, regarding risk management, still raise wide-ranging questions.

This work aims at contributing towards understanding the means of governance regarding DRR in intermediate cities, analyzing the post-disaster public action after hurricanes Ingrid and Manuel hit Coyuca de Benítez in 2013, a municipality that is part of the Acapulco Metropolitan Area (ZMA, in Spanish). From a conceptual point of view, this study takes an adaptive governance approach, which does not propose a single strategy and/or definition, nor a centralized management in the hands of the public or private sector, but rather one based on a high knowledge transfer, and on the articulation between a management capacity at a municipal and/or community level of the territory, and a centralized management of certain protected areas or infrastructures that is usually in the hands of the public or private sector (Kenward *et al*., 2011). Adaptive governance is also known as experimental governance, as it implies a process of constant readjustment, understood as "learning by doing", which allows for the continuous adaptation of governance patterns, and establishes as premises, the multiple systemic interactions between the players and scales that have an impact on the territory (Tosun & Lang, 2017). Finally, this approach suggests the formation of structure monitoring communities and mechanisms, along with organizational processes (Kaika, 2017), as well as the expansion of urban planning and territorial organization tools and mechanisms, connecting not just the rural and urban matters, but also the social, economic, environmental, and political ones (Salazar, Irarrázaval & Fonck, 2017). Starting from these guidelines, this article explores the contrasts between the aforementioned conceptual and regulatory proposal, and the dynamics in the territory within a context of post-disaster attention.

As a methodological framework, the study mobilizes the perspective of the Political Sociology of Public Action (Lascoumes & Le Gales, 2014), analyzing the different players, relationships, articulations, structures, and mechanisms that take part in the reconstruction of major infrastructure, public services, and housing in Coyuca de Benitez, ZMA. It is argued that, in spite of the decentralization and democratization efforts in recent decades, the governance patterns are still highly centralized and are not very adaptive, holding back the running of participatory and articulated interventions that satisfy the daily needs of the people, and that reduce the disaster risk in the territories, problematizing urban and territorial management. The research emphasizes the importance of developing not just regulatory frameworks like adaptive governance, but also a reflection about the methods to approach these.

II. THEORETICAL FRAMEWORK

Decentralization and intermediate cities: towards a questioning of governance

In Latin America, the rise in importance of intermediate cities falls within the readjustment of the urbanization pattern in play since the end of the last century, associated to demographic transition, State reform, and globalization (Carrión, 2013). Following the argument of Carrión (2013), in the region, the State reform linked to decentralization, that sought to democratize the territories through the transfer of responsibilities and resources, coming from orders from central to local governments, is of special interest. However, this decentralization has taken place within a lack of structures and roles that support the consolidation and concretion of agreed upon and participatory projects in the territory (Gómez-Álvarez, Rajack & López Moreno, 2019).

In this process, intermediate cities, defined not just by the size of their population or of their territory, but from the implementation of articulation roles between territories (rural and urban), and of intermediation between local, regional, national, and global spaces (Bellet & Llop, 2004), have experienced important changes on being one of the main recipients of the decentralizing policies, although

with very few results. For some time now, intermediate cities were characterized as urban spaces with balanced and sustainable systems, that were more "easily governed, managed, and controlled" (Bellet & Llop, 2004, p. 33). However, it is currently clear that these cities have great challenges that come from the unequal distribution of resources and capacities, the dependence on central powers, the lack of trained personnel, the intervention of private players, and the primacy of economic interests external to their territories, all these linked to the limitations of the decentralization processes (Gómez-Álvarez *et al*., 2019).

In this context, the issue of governance has been crucial, as this is focused on the coordination processes of institutions, players, and actions to collectively achieve the established goals (Lascoumes & Le Gales, 2014). Recent studies have developed conceptual and regulatory frameworks that state that, in order to face the challenges of decentralization and democratization, the collaborative transformation of the State-society relationship must be looked into.

The perspective of adaptive governance

Adaptive governance represents a recent approach in these areas, which states that the sole existence of laws, standards, and regulations, usually centralized and in State hands, is insufficient to trigger an effective decentralization of responsibilities; in other words, promoting open networks of relationships among multiple players capable of setting common goals and actions (Kenward *et al*., 2011; Li *et al*., 2017). The increase of political competences and technical capacities of the urban players, at an individual level, is built more effectively though systemic and continuous interactions among multiple players, and on multiple scales (Chindarkar, Howlett & Ramesh, 2017).

The perspective of adaptive governance starts from three key premises. First, it suggests that urban and territorial planning requires the (horizontal) articulation of different sectors and their interests, as well as the (vertical) articulation of different scales, both at decision making and territorial levels; since pursuing the goals of a single sector/scale tends to block other players (Tosun & Lang, 2017), in particular, the vulnerable people who are living in poverty or in risk areas (Fernández-Álvarez, 2017; Kaika, 2017).

It also states that moving towards adaptive or experimental governance structures (Kenward *et al*,.2011; Li *et al*., 2017) requires creating mechanisms and communities, to continuously monitor the organizational structures and their processes. Among some of the issues to monitor are the formation of intermediate players with the role of incorporating new ones, in particular, from dissenting communities and/or those with disadvantages, inter-scale and inter-sectorial interaction, and the design of substantial policies that promote new means of interaction and financing that encourage collaboration and the development of plausible and innovative alternatives (Kaika, 2017).

Finally, it uncovers the need to broaden the territorial planning mechanisms and/or tools, including the complex rural-urban ties, and the interrelations between social, political, and economic processes, on different scales (Salazar *et al*., 2017). Along this same line, Folke (2016) and Galaz *et al.* (2012) state that, to manage a more suitable and resilient development, it is necessary to strengthen polycentric governance structures, to promote interactions among sectors and scales to understand the relationship between nonlinear variables, between different response times, and especially, to promptly respond to the needs of the different players, especially those in risk situations.

Although it may be desirable to address the premises of adaptive governance, especially those regarding risk and disaster reduction, the question arises about what the convergences or divergences in terms of the dynamics in the territories are, in particular, regarding the articulations among players and intervention scales in DRR matters.

III. CASE STUDY

The ZMA, located in the State of Guerrero, comprises the municipalities of Acapulco de Juárez and Coyuca de Benítez. It has a population of 887,005 (National Institute of Statistics and Geography [INEGI], 2016), and constitutes a regional cluster, both by its size and its mediator role, connecting different rural and urban settlements in the State, and with other cities in Mexico (Figure 1). The expansion of the urban sprawl and the population in the ZMA has fundamentally been driven by the development of Acapulco as a beach resort, rising from 55,000 inhabitants in 1950, to more than 600,000 in just 5 decades.

The municipality of Coyuca de Benítez has seen a smaller population growth and less urban expansion. However, the area between the cities of Acapulco and Coyuca, considered by this study as an urban-lacunar system, has experienced a major transformation linked to the urban and touristic development of Acapulco. This zone is structured around the Coyuca River, the main catchment in the municipality, born under the Guerrero mountains, which borders the municipal capital of Coyuca to the East, and feeds the coastal lagoons of Coyuca and Mitla, before emptying into the Pacific Ocean. This area is also structured by the federal highway that connects Acapulco with the municipalities of Costa Grande to the East of the State, important regions for agroindustry, coconut production, and tourism, like the case of Zihuatanejo, the second largest tourism hub in Guerrero, located a little over 200 km from Acapulco.

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HECTOR BECERRIL, LUISA FERNANDA RODRÍGUEZ CORTÉS, KAROL YÁÑEZ SORIA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 46 - 57
ISSN 0717 - 3997 / 0718 - 3607

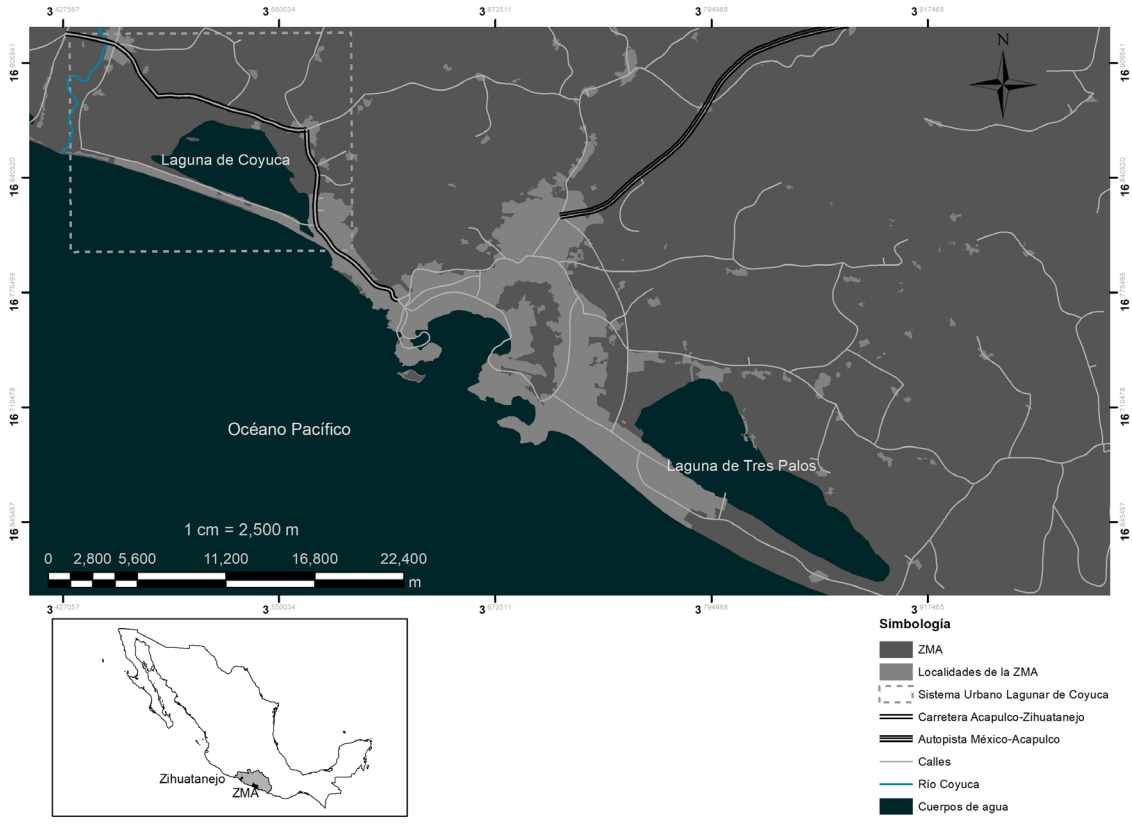

Figure 1. Acapulco Metropolitan Area. Source: Preparation by Sendy Atzyl Pérez Reyes, with vectorial data from the National Commission for the Knowledge and Use of Biodiversity (CONABIO) (2018).

The municipality of Coyuca is characterized by a high degree of marginalization (National Population Council [CONAPO], 2016), where more than half its population live in poverty (55.2%) (National Council for the Assessment of the Social Development Policy [CONEVAL], 2015). In financial matters, the municipality depends to a great extent on federal transfers. Likewise, Coyuca is considered as a very high risk municipality with regard to severe weather (Arreguín, López, Rodríguez & Montero, 2015). In September 2013, said risk was materialized with hurricane Manuel, on the Pacific Ocean to the South of the ZMA, and Ingrid, in the Gulf of Mexico, which caused heavy rain and flooding for 3 consecutive days, causing major damage.

The post-disaster actions, which the different public and private players took part in, were a key moment in the ZMA's management, which is why, as a whole, they allow exploring the prevailing governance patterns, and to contrast them with the perspective of adaptive governance. Furthermore, this experience is relevant for said exploration, as the ZMA has the typical traits of settlements of under a million inhabitants around the world, marked by limited institutional capacities, and a relevant urban growth that demands forming alternative governance patterns.

IV. METHODOLOGY

This research is based on the approach of Political Sociology of Public Action, as it allows approaching governance processes like a result of the combination of public and private players, with the State being just another element of a complex collective dynamic. Said approach focuses its attention on "the players, their exchanges, and the sense they give to these, but also the institutions, standards, and procedures that govern the set of interactions, as well as the collective representations" (Lascoumes & Le Gales, 2014, p. 16). In this sense, the study conceptualizes governance as "a set of state and

Phases	Technique or method	Tool or Instrument	Results
Phase 1. Delimitation of the universe of public action.	Factor layouts involved in the vulnerability on facing the risks	Diagnostic document of Coyuca (previous research) Field visits Interviews with key players	Determination of the public action to be studied
Phase 2. Analysis of players and their relationships	Institutional framework layout	Document revision	Political-institutional context and substantial chronological description of the development of the public action
	Mapping of key players	Interviews Document revision	
	Mapping of relationships during the design and implementation of the actions	Interviews Document revision	
Phase 3. Analysis of results and impacts	Results matrix by type of public action	Participatory workshop	

Table 1. Summary of the methodology. Source: Preparation by the Authors.

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REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 46 - 57
ISSN 0717 - 3997 / 0718 - 3607

non-state players interconnected by formal and informal ties, who operate within a policy formulation process and are integrated in specific institutional settings" (Marques, 2013, p. 16). Based on this, the analysis of the ways of governance of public action included the identification of the institutional and political frameworks, the characterization of the state and non-state players, and their relations, within the public policy processes.

Operationally speaking, the work was divided into three phases. During the first, the analysis was limited to the public action related to post-disaster attention after floods, which represents one of the main threats associated to risks and climate change in Coyuca de Benítez. As a result, different relevant actions were identified, like the reconstruction of (i) major infrastructure, and of (ii) public services and housing. In the second phase, the ways of governance of said actions were analyzed, including for each type of action, the exploration of the institutional and political frameworks, the characterization of the state and non-state players, and their relationships, within the design and implementation processes of the public action. Finally, during the third phase, the results and impacts of the public actions implemented were surveyed using interviews, focus groups, and a participatory workshop (Table 1). During the research, information was produced from primary (interviews, focal groups, etc.) and secondary sources, such as government programs, public policy documents, reports, and printed press sources. With this information, substantial chronological descriptions were prepared for each type of public policy, through which the key players, relationships, resources, processes, and participation in decision-making that make up the governance pattern in place for post-disaster actions, were identified. These substantial descriptions allowed analyzing the experiences against the premises of adaptive governance.

V. RESULTS

The following general characteristics, which must be considered in the analysis, were identified as part of the revision of the institutional and political frameworks regarding public action in Mexico, which have an impact on the different post-disaster actions.

In Mexico, the decentralization process led by the political modernization and the democratic opening of the 1990s, allowed state and municipal governments to achieve greater participation in the policies implemented in their territories. For this, it was sought that the municipalities increased their resources and gained autonomy in the preparation of their local development plans and strategies. However, the federal government continued to define said policies, and the state system continued to be highly centralized, which is still an obstacle for the autonomy and independence of municipal governments in their different instances (Cabrero, 2015).

Regarding the urban development and territorial organization policies, the federal frameworks establish that said powers are present in the three levels of government (municipal, state, and federal). However, the areas of action for each level are not clearly laid out, and the municipalities only take on some of the powers, given their insufficient

GOBERNANZA DE CIUDADES INTERMEDIAS
APRENDIENDO DE ACCIONES POST-DESASTRE EN LA ZONA METROPOLITANA DE ACAPULCO, MÉXICO
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REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 46 - 57
ISSN 0717 - 3997 / 0718 - 3607

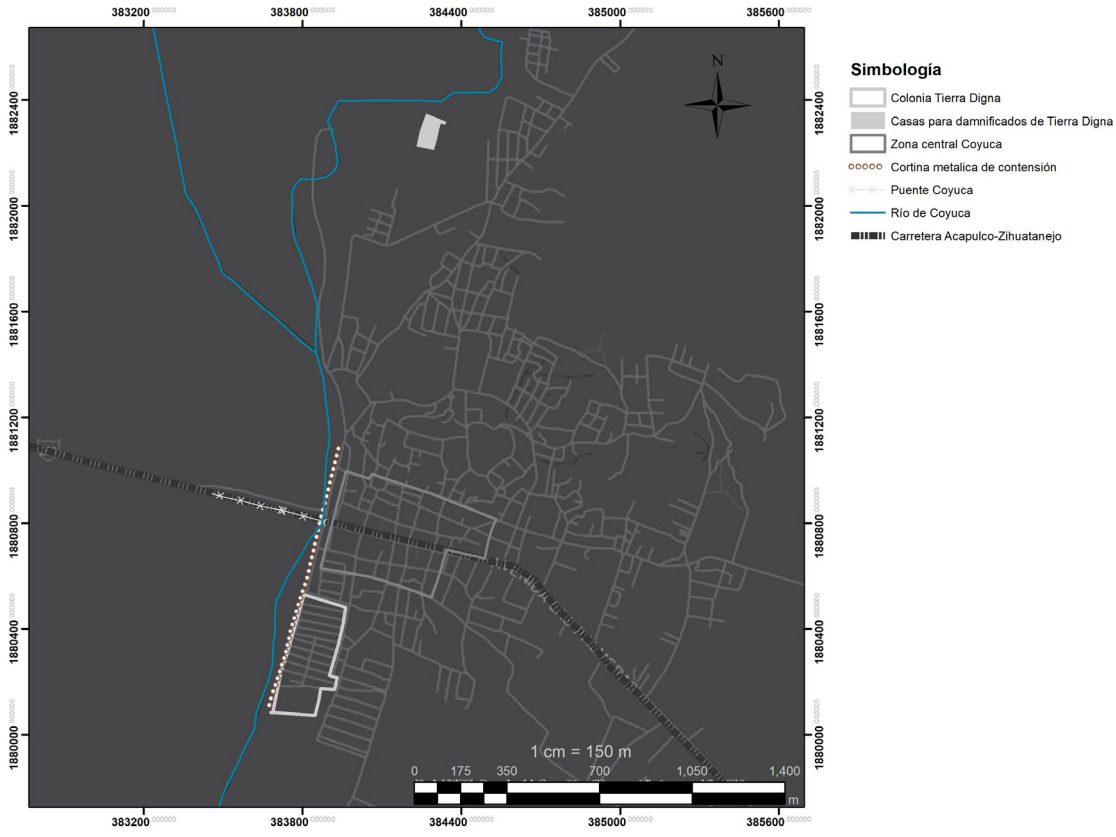

Figure 2. Post-disaster actions. Source: Preparation by Sendy Atzyl Pérez Reyes with vectorial data from the National Commission for the Knowledge and Use of Biodiversity (CONABIO) (2018).

financial, technical, and human resource capacities, among others. In addition, the federal government continues to control the design and operation of policies related to the urban development of the municipalities, such as health, education, and the fight against poverty, while the municipal governments continue still have no legislative powers (Cabrero, 2005).

Despite this, to foster coordination in urban development and territorial planning among municipalities, states, and the federal government, in 2013 the Secretariat of Territorial Urban Development (SEDATU, in Spanish) was created, to cover issues such as the regularization of agrarian ownership, the urban development of cities and metropolitan areas, and housing planning (Official Gazette of the Federation [DOF], 2015). But the reach of SEDATU has been limited, since a recentralization policy was set out, under which the territorial policy at a local scale was reduced to "financing labeled through federal transfers, making the "bottom-up" design of policies for urban development, impossible" (Verdugo, 2017 p. 190).

As for actions for the prevention and management of natural disasters, these fall within purvey of the National Civil Protection System (SINAPROC), created from the need of establishing an articulated layout, based on the identification of natural disasters as public affairs and thus as responsibility of the State (Morán Escamilla, 2017). It has also been sought to decentralize the attention of damages from natural phenomena, which is initially done by subnational entities, and when the magnitude of the natural disasters exceeds their response capacities and resources, the federal government takes part through the National Natural Disaster Fund (FONDEN), whereby resources are channeled for the immediate attention of the affected population, and for the later reconstruction (Rodríguez Esteves, 2004). In this context, after a natural disaster, the Secretariat of Communications and Transport (SCT), among others, is responsible for repairing or rebuilding federal communication links with FONDEN resources (SCT, 2015). Meanwhile, SEDATU is responsible for promoting and coordinating among the three government levels, the risk mitigation and prevention actions in urban settlements, and the evaluation, attention, and remediation of damaged homes and infrastructure (DOF, 2015).

Figure 3. Protection curtain and Coyuca I Bridge in April 2017. Source: Photograph courtesy of the Coyuca Climate Resilient Project.

It is starting from and through said highly centralized and not very democratic institutional frameworks, that the specific ways of governance for the post-disaster public actions analyzed in this work are produced and reproduced: reconstruction of major infrastructure, public services, and housing. The following key elements are described below for each way of governance: key players, degree of participation of non-governmental players, alliances, and conflicts between players, and the results and impacts on risk reduction.

Reconstruction of major infrastructure

In September 2013, hurricanes Ingrid and Manuel caused major damage in the ZMA. Among other aspects, the Coyuca River broke its banks, destroying them and flooding entire neighborhoods, while Coyuca I bridge, located on the river with the same name, and part of the Acapulco – Zihuatanejo highway, collapsed.

In Coyuca's main city, the post-disaster actions included the reconstruction of the aforementioned bridge, and the reinforcement of the left bank of the Coyuca River with a metal contention curtain at the height of the main city. These works were financed by FONDEN, which could be accessed thanks to the declaration of a "Natural Disaster" (DOF, 2014).

The reconstruction of the bridge was supervised by the SCT, which assigned the works to Freyssinet Mexico, a specialized company that, in recent decades, had carried out several works in Guerrero. Freyssinet was in charge of the construction of a temporary bridge, and for the design and plans of a new bridge, as well as for the selection of materials and labor. The construction of both the temporary and the definitive bridge allowed quickly reestablishing connection of the municipality of Coyuca and the ZMA with the municipalities of Costa Grande. Works began just 5 days after the collapse of the old structure (on September 18th, 2013), and were finished in July, 2014.

At the same time, the construction of the protection curtain was supervised by the National Water Commission (CONAGUA), the SCT, with the participation of UrioTech and Peninsular Compañia Constructora S.A. de C.V., affiliate of the company, Hermes Construcción, highly specialized companies with decades of experience. This work, which did not arise from any local demand, or include prior studies, began in December 2013 and was finalized in June, 2014. Currently, as a result of field work, it was seen that in the rainy season, the curtain impedes that water runs off into the river, causing flooding in the areas alongside it, like the Tierra Digna neighborhood (Figures 2 and 3).

Reconstruction of public services and housing
Regarding public services, the post-disaster action focused on the sanitation system, that was greatly impaired by hurricanes Ingrid and Manuel. For example, in El Bejuco, located alongside the Coyuca River, the drains that had not been renewed for 40 years, collapsed in some sections, leading to raw sewage spillages and sources of infection. It is important to mention that El Bejuco, as well as most of the urban-lacunar system locations (Figure 1), are in precarious situations: educational gaps, unemployment, lack of infrastructure, and public services (CONEVAL, 2015; INEGI, no date).

Despite the different demands of the inhabitants to resolve the sanitation issue, the works were done 8 months after the hurricanes hit. The work was done by the Secretariat of Environment and Natural Resources (SEMARNAT, in Spanish) using federal funds (CONAGUA, 2014). There was practically no participation of municipal players, while both the communities of Coyuca and the municipal governments were only informed about the approval and installation of the project. In the case of El Bejuco, once the project was handed over in 2016, there were complaints from the

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HECTOR BECERRIL, LUISA FERNANDA RODRÍGUEZ CORTÉS, KAROL YÁÑEZ SORIA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 46 - 57
ISSN 0717 - 3997 / 0718 - 3607

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HECTOR BECERRIL, LUISA FERNANDA RODRÍGUEZ CORTÉS, KAROL YÁÑEZ SORIA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 46 - 57
ISSN 0717 - 3997 / 0718 - 3607

Figure 4. Housing for the affected in September 2018. Source: Photograph courtesy of the Climate Resilient Coyuca Project.

Type of public action	Key players	Participation of non-governmental players	Alliances and conflicts	Results and impacts
Reconstruction of major infrastructure	Federal Government (SCT, CONAGUA), Specialized companies (Freyssinet, UrioTech, Peninsular Compañia Constructora S.A. de C.V.)	None	Long term alliances between the federal government and the specialized private sector. No conflicts were identified between the private sector and the federal government.	New floods due to the design of the reinforcement wall alongside the Coyuca River
Reconstruction of public utilities and housing	Federal Government (CONAGUA, SEDATU, PROFEPA and the Civil Protection Direction)	None	Demands from the neighbors/ inhabitants due to the poor quality of the infrastructure built and delays in handovers. Clash between entities of the federal government due to the location of the reconstruction area of the housing, and its risk condition.	Lengthening of the vulnerability conditions of the affected inhabitants. Reproduction of risk situations due to the location of the new housing, and the conditions of the new sanitation services.

Table 2. Key elements in the ways of governance of post-disaster public action after hurricanes Ingrid and Manuel. Source: Preparation by the Authors.

neighbors about its inadequate installation, with sections where the drains were not connected, which led to constant overflows of raw sewage (Pacheco, 2014a). In addition, the water treatment oxidation lagoon was located upstream, impeding the natural flow of the wastewater and causing constant blockages and a difficult maintenance. It is worth adding that the inhabitants of El Bejuco had identified a better location for the lagoon, but they were ignored.

For the reconstruction of housing, SEDATU evaluated the damages, made a census of the people affected, and led the repair and reconstruction process. However, this process experienced several delays and setbacks, and as of January 2018, had not yet been concluded. Among other aspects, the resources were not used in the period allocated and, later, the contracts exceeded the permitted resources (Secretariat of the Treasury and Public Credit [SHCP, in Spanish], 2014). In addition, in 2014, the Civil Protection Direction stopped the construction of four of the dwellings on being located in a high risk area (Pacheco, 2014b), and later, the Federal Attorney's Office for Environmental Protection (Profepa, in Spanish) closed down the construction of 44 houses assigned to those affected in the Tierra Digna neighborhood, a shanty town that did not have basic utilities and that was seriously hit by the hurricanes, for this same reason (Pacheco, 2016). It is necessary to highlight that the Tierra Digna Neighborhood is in the heart of Coyuca, while the houses for those affected were built upstream, with a difficult connection to the municipal hub and the services this provides (Figures 2 & 4).

Table 2 summarizes the key elements presented regarding each way of governance.

VI. DISCUSSION

In general, the analysis shows a limited or non-existent articulation of the players, their interests and their scales of action, which contrasts considerably with the premises behind promoting an adaptive governance (Kenward *et al*., 2011; Li *et al.*,2017; Chindarkar *et al.*, 2017).

This coincides with Tosun & Lang (2017) in that on prioritizing the goal of a single sector/scale, other players and interests are hindered. The case shows the priority given to the regional and national connectivity and economy, with the rapid and effective reconstruction of the Coyuca I bridge, to the detriment of the sanitary and housing infrastructure needs of Coyuca's population. Likewise, it is corroborated that the disconnection between players and scales (as happens with the shutting down of the reconstruction of housing, on being located in risk areas) leads to interventions that are unsuitable for the needs of the different players, in particular the populations at risk, as Folke (2016) and Galaz *et al*. (2012) propose. But it is not just that. The case shows how more precarious conditions and new risks are fostered, for example, the recent flooding of neighborhoods like Tierra Digna, after the construction of the protection curtain, or the construction in areas prone to flooding and far from the urban center for those affected.

On the other hand, no mechanisms or players that continuously monitor the governance structures and their processes are detected, and who foster the inclusion of new players, their knowledge, and needs, as Kaika (2017) and Fernández-Álvarez (2017) mention. Despite the creation of SEDATU, the knowledge, design, and planning continue to be predominantly centralized. In addition, the analysis shows that post-disaster actions are interventions disconnected from the urban planning and territorial organization tools, leaving aside the urban-rural dynamics, and the different development aspects (ecological, economic, social, and political), as Salazar *et al.* (2017) propose. Alongside this, and in mutual interdependence, no mechanism or spaces of inter-sectorial connection, and between scales, are detected, or the existence of open networks that increase the political competences and technical capacities of municipal players.

VII. CONCLUSIONS

The study presented shows that the governance patterns in Coyuca are highly centralized and not very adaptive, limiting the development of participatory and articulated interventions that reduce disaster risks in the territories.

Beyond Coyuca, the research made allows considering that the challenges of governance of intermediate cities when facing risks and climate change, do not just imply the development of technical or administrative capacities, but also the transition towards governance patterns that recognize and strengthen the role of the public, private, and civil society sectors, their articulation, the configuration of adaptive structures, and suitable territorial planning mechanisms. In this framework, the absence of a suitable vertical and horizontal articulation among players and institutions, the permanence of rigid structures that are away from the local dynamics, as well as weak territorial planning mechanisms, are added to the already identified institutional weaknesses and the lack of capacities of local governments.

Regarding the methodology, this was shown to be useful to track the interconnections and relationships between players and actions, showing the prevailing patterns that a particular way of government reproduces in the region. Specifically, the analysis of the institutional and political framework was crucial to better understand the players and their actions. As for the theoretical framework, the study made the great distance between adaptive governance and its premises

GOBERNANZA DE CIUDADES INTERMEDIAS
APRENDIENDO DE ACCIONES POST-DESASTRE EN LA ZONA METROPOLITANA DE ACAPULCO, MÉXICO
HECTOR BECERRIL, LUISA FERNANDA RODRÍGUEZ CORTÉS, KAROL YÁÑEZ SORIA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 46 - 57
ISSN 0717 - 3997 / 0718 - 3607

evident, as well as the prevailing governance patterns in Coyuca, questioning their pertinence to guide transformative changes in urban settings like the ZMA in Mexico and in other areas. In this sense, the reflection and generation of suitable conceptual and regulatory frameworks appear as essential, not just to understand the problematic situations vis-à-vis governance of cities, but also to take action.

All-in-all, intermediate cities are spaces of opportunity with multiple comparative advantages over large urban conurbations. However, the complexity of the governance processes and the challenges of DDR and the climate crisis require new cognitive and regulatory layouts for the administration of their territories. This is where different lines of research open, that can contribute to the understanding and strengthening of these cities against DDR and climate action and that, at the same time, acknowledge the political dynamics and tensions present on a local scale.

GOBERNANZA DE CIUDADES INTERMEDIAS
APRENDIENDO DE ACCIONES POST-DESASTRE EN LA ZONA METROPOLITANA DE ACAPULCO, MÉXICO
HECTOR BECERRIL, LUISA FERNANDA RODRÍGUEZ CORTÉS, KAROL YÁÑEZ SORIA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 46 - 57
ISSN 0717 - 3997 / 0718 - 3607

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DIAGNOSIS OF USE AND DESIGN OF PEDESTRIAN SPACE[1]

CONTRIBUTIONS FROM THE LANDSCAPE FOR THE CITY OF LA PLATA, ARGENTINA

DIAGNÓSTICO DE DISEÑO Y USO DEL ESPACIO VIAL PEATONAL
APORTES DESDE EL PAISAJE PARA LA CIUDAD DE LA PLATA, ARGENTINA

MARIANA EVELYN BIRCHE [2]

1 Este trabajo se desarrolló en el marco de una beca postdoctoral denominada " Los espacios de la movilidad como elementos estratégicos para un crecimiento urbano más sustentable. El caso de la ciudad de La Plata, Argentina" desarrollada en el Centro Nacional de Investigaciones Científicas y Técnicas (CONICET).

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En el marco de escenarios urbanos de creciente complejidad, la infraestructura de los espacios viales de las ciudades se encuentra todavía casi exclusivamente dedicada a los autos. La ciudad de La Plata no es la excepción, presentando además un interesante contraste entre sus áreas urbanas planificadas y aquellas que han crecido por expansión del tejido residencial. El concepto de espacio peatonal es entendido a partir de las distintas funciones que cumple no sólo en cuanto infraestructura de transporte sino también en cuanto espacios públicos y estratégicos para la conformación del paisaje urbano. Así, el trabajo se propone, por un lado, la generación de información primaria y, por otro, la construcción de un diagnóstico sobre el diseño y uso del espacio peatonal. Para esto, se realiza un relevamiento del estado actual del espacio peatonal, sus dimensiones, características morfológicas y elementos paisajísticos. Si bien existe una cantidad adecuada de espacio reservado al uso peatonal, se verifica que en muchos sectores aún no resulta accesible ni agradable para los ciudadanos debido a su mal estado o nulo tratamiento.

Palabras clave: Vialidad urbana, paisaje urbano, espacio público, ciudad, relevamientos.

In the context of increasingly more complex urban scenarios, the infrastructure of the city's road spaces is still almost exclusively dedicated to cars. The city of La Plata is no exception, also presenting an interesting contrast between its planned urban areas and those that have grown due to urban sprawl. The concept of pedestrian space is understood starting from the different functions it fulfills, not only insofar as a transport infrastructure, but also as public and strategic spaces that shape the urban landscape. Thus, this article proposes, on one hand, the generation of primary information and, on the other, the construction of a diagnosis about the design and use of the pedestrian space. For this, a survey of the current state of the pedestrian space, its dimensions, morphological characteristics, and landscape elements, is carried out. Although there is an adequate amount of space reserved for pedestrian use, it is confirmed that in many sectors it is still not accessible or pleasant for citizens, due to its poor condition or complete lack of upkeep.

Keywords: Urban roads, urban landscape, public space, city, surveys.

DIAGNÓSTICO DE DISEÑO Y USO DEL ESPACIO VIAL PEATONAL
APORTES DESDE EL PAISAJE PARA LA CIUDAD DE LA PLATA
MARIANA EVELYN BIRCHE
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 58 - 69
ISSN 0717 - 3997 / 0718 - 3607

DIAGNÓSTICO DE DISEÑO Y USO DEL ESPACIO VIAL PEATONAL
APORTES DESDE EL PAISAJE PARA LA CIUDAD DE LA PLATA
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PÁG. 58 - 69
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I. INTRODUCTION

This article starts from the understanding the importance of the design of the pedestrian space, to collaborate in resolving issues inherent to the city's public space, including lack of safety, accessibility, traffic accidents, and also the environmental and landscape quality of the urban space: "Think about a city, and what comes to mind? Its streets. If the streets of a city look interesting, so does the city; if they are boring, then the city looks boring" (Jacobs, 1961, p. 107). Starting from this premise, this research proposes integrating the social and aesthetic views, typical of the landscape approach, to the classical functionalist view of these spaces. The purpose of this work is based, on one hand, on the generation of primary information to provide new concrete data, that can be used to contribute to future studies on the quality of the street and landscape space; and, on the other, in the construction of a diagnosis about the design and use of the pedestrian space in the city of La Plata.

The history of cities had a turning point at the beginning of the 20th century, with the start of the widespread production of cars. The international style in architecture and urbanism of the start of the century often turned to the creation of large spaces (for the car) with a functionalist design, leaving aside the small scale and humanization of the spaces. This, added to the exponential increase of the number of cars circulating alongside deficient planning, led to a series of strong mainly qualitative critiques around the world in the 1960s. These critiques were captured in the contributions of the books of Gordon Cullen (1959), Sylvia Crowe (1960), Kevin Lynch (1960), and Jane Jacobs (1961).

Although the goal of this revolutionary wave against modern urbanism was reclaiming humanism in the city, today the street space is almost exclusively dedicated to cars, and it is difficult for other means of mobility to connect to the system. This aspect, referring to the accessibility of street spaces, is stated in different research projects (Arroyo, 1992; Pozueta Echavarri, 2014; National Association of City Transportation Officials [NACTO], 2016, Herce, 2008), while others return specifically to the aspects of road safety (Merchán, González & Noreña, 2011; Pérez-Stefanov, 2019). Some studies, like that presented by López and Ravella (2019), point out, from a more comprehensive viewpoint, the functionalist conception of spaces of mobility and the lack of integrated design platforms. Following this line, this document looks further into the spatialization and cartographic elaboration of key variables to design the pedestrian space, in order to contribute to their visualization. The case study was chosen on representing the issues that countless Latin American cities face (phenomena of diffusion and dispersion). It is well known that diffusion phenomena favor the increase of motorization rates and contamination. Although local governments have incorporated measures like infrastructure for bicycles, these interventions have mainly taken place in central areas, leaving the large peripheral sectors, which urgently need improvements in the quality of their environment, aside. This situation has been defined by Delgadillo (2014) as "a la carte urbanism", which are similar to other public policies, urban programs, and urbanistic "recipes" that seek to build a good image for the city, by improving areas that are most visually exposed to the population and its visitors.

II. THEORETICAL FRAMEWORK

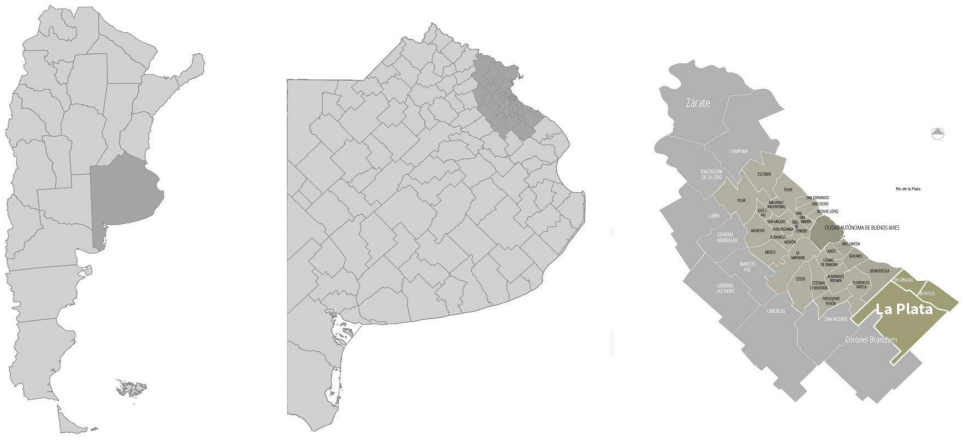
Pedestrian space design, key for 21st-century cities

Delgado (2011) conceives the public space as a political category and states that this needs to be urgently ratified as a place, becoming the "flesh between us" (p. 28). Thus, this public space (in a theoretical principle) becomes a real and sensitive space.

Within the category of public spaces, the street space is considered as the public connection space, understanding that, if the city is a meeting place par excellence, more than anything else, the city is its pedestrian public space (Gehl, 2006).

In this sense, a higher quality pedestrian space, introduced through a larger amount of urban vegetation, would lead to improvements in safety -as there would be more people on the street – (Kuo & Sullivan, 2001, p. 359), and in the environmental and landscape quality (Säumel, Weber & Kowarik, 2016, p.25). On the other hand, the creation of safer pedestrian spaces could be done through virtual walls with trees and defined boundaries for drivers, with the resulting reduction in car speed (Eisenman, Coleman & Labombard, 2021, p.2). Likewise, it is vitally important to consider suitable dimensions for the pedestrian space (NACTO, 2016), the creation of sidewalks in those urban areas that do not have them yet (Birche, 2020), and the placing of elements that guarantee universal access, like ramps and tactile paving.

In some places, before others, it can be seen how cities slowly began to give more spaces to pedestrians, phenomena that have seen a renewed momentum since the beginning of the 21st century, when city center pedestrianization works were inaugurated in La Plata and the micro-center of Buenos Aires. By 2010, Mexico City



Argentina
41,22 M hab.

Provincia de Buenos Aires
16,66 M hab.

Gran Buenos Aires
13,58 M hab.

Gran Plata
0,8 M hab.

Figure 1. Location of the city of La Plata. Source: Preparation by the Author (2019).

DIAGNÓSTICO DE DISEÑO Y USO DEL ESPACIO VIAL PEATONAL
APORTES DESDE EL PAISAJE PARA LA CIUDAD DE LA PLATA
MARIANA EVELYN BIRCHE
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 58 - 69
ISSN 0717 - 3997 / 0718 - 3607

saw its first conversion to pedestrian-only streets. In the same way, two of Broadway's most crowded sections were pedestrianized, as a pilot that was for less than a year, but that has continued up until today.

Interventions like these have been made to improve the urban landscape, and to improve public street spaces, encouraging people to use them rather than cars. Both on the theoretical and practical plane, it can be said that there is an evolution of the concept of landscape from an aesthetic and/or conservationist view, towards new perspectives that link it to territorial development (Birche, 2020). This would entail reinforcing economic and social aspects of landscapes, conceived as spaces for people to enjoy, and as assets for development. New practices and numerous theoretical contributions have emerged along this line, especially in the 1990s (Silvestri & Aliata, 2001; Santos, 2000; Nogué, 2007; Roger, 2007), including regulatory issues like the first Exclusive Law for Landscape in France (1993), and the Florence/European Landscape Convention (2000). Phenomena like pedestrianization, re-functionalization, and the renewal of large urban city centers show that the concept of landscape is capable of revitalizing street public spaces.

The pedestrian space in the city of la Plata

The city of La Plata is 60 km to the southeast of the Autonomous City of Buenos Aires (Figure 1). Upon its foundation, conceived to be a provincial capital, it was presented to the world as a modern city, capable of both satisfying the new pressing needs of hygiene and aesthetics taken onboard in Europe.

The city of La Plata is a clear example of how the road network is the true structure of the territory. As Herce (2008) shows, in principle, the network only acts as a nexus between strategic nodes which are then ranked and absorbed by the occupation of scattered buildings. The sprawl of the system built in the diffuse city brings with it the need to transport people, materials, and energy increasing distances, which increases motorized transportation. According to Rueda (1997), the diffuse model causes an increase in 1) mobility difficulties: congestion; 2) travel times due to distance: congestion; 3) occupation of the public space; 4) inaccessibility; 5) emission of gases into the atmosphere; 6) noise levels above admissible thresholds; 7) insecurity and amount of accidents; 8) naturalization of circulation conditions and their effects; 9) fragmentation of the natural systems; and, 10) degradation of the public space. All these aspects can be seen in the case of La Plata, which adopted a diffuse growth model early on.

Within the hub, four particular morphological elements can be seen: the system of streets, avenues, and diagonal streets; the system of squares and green spaces; the block system; and the distribution system of the public buildings (Birche & Jensen, 2018).

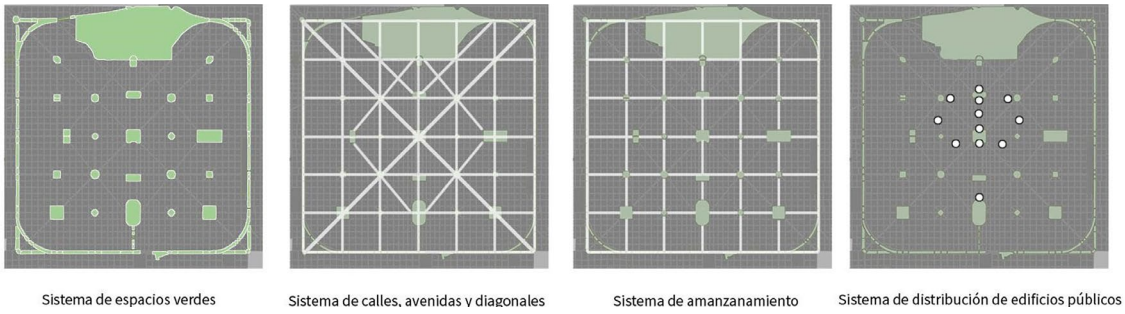


Figure 2. Particular morphological elements within the foundational hub. Source: Preparation by the Author (2019)

Figure 3. Reduction of the central esplanade on Diagonal 79. Source: Mitos platenses.

DIAGNÓSTICO DE DISEÑO Y USO DEL ESPACIO VIAL PEATONAL
APORTES DESDE EL PAISAJE PARA LA CIUDAD DE LA PLATA
MARIANA EVELYN BIRCHE
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 58 - 69
ISSN 0717 - 3997 / 0718 - 3607

These elements respond to criteria of order, organization, and balance between the built and the public space, seeking a balanced distribution of activities and circulation. This plan reserves 58% of its surface for construction, 35% for circulation spaces, and 9% for squares and parks.

As of 1930, the period of car dominance begins. In this way, the road system of the city is transformed to give more space to private motorized transport, just as in most Argentinean cities. The preeminence of the bus and the train, typical of the 1980s, was lost almost simultaneously from the mid-90s **3**. In line with this, diagonal streets and avenues were modified, starting with the elimination or reduction of the central esplanades and/or their forestation, generating a loss of hierarchization and a conflictive reading of the city landscape.

Currently, the public street space in the city represents, by 2019, 18.2% of the surface assigned as an urban area which, added to the 3.7% corresponding to green public

3 While in 1990, the motorization rate was 1 car every 7 people (Ravella & Giacobbe, 2001), in the 1990s, a significant increase in said rate occurred, rising to 5.4 inhab./car in 1991, and 4.5 inhab./car in 2001. Today, the motorization rate is estimated at 2.3 inhabitants per car in a city of approximately 700,000 inhabitants (Aón, López & Cortizo, 2014).

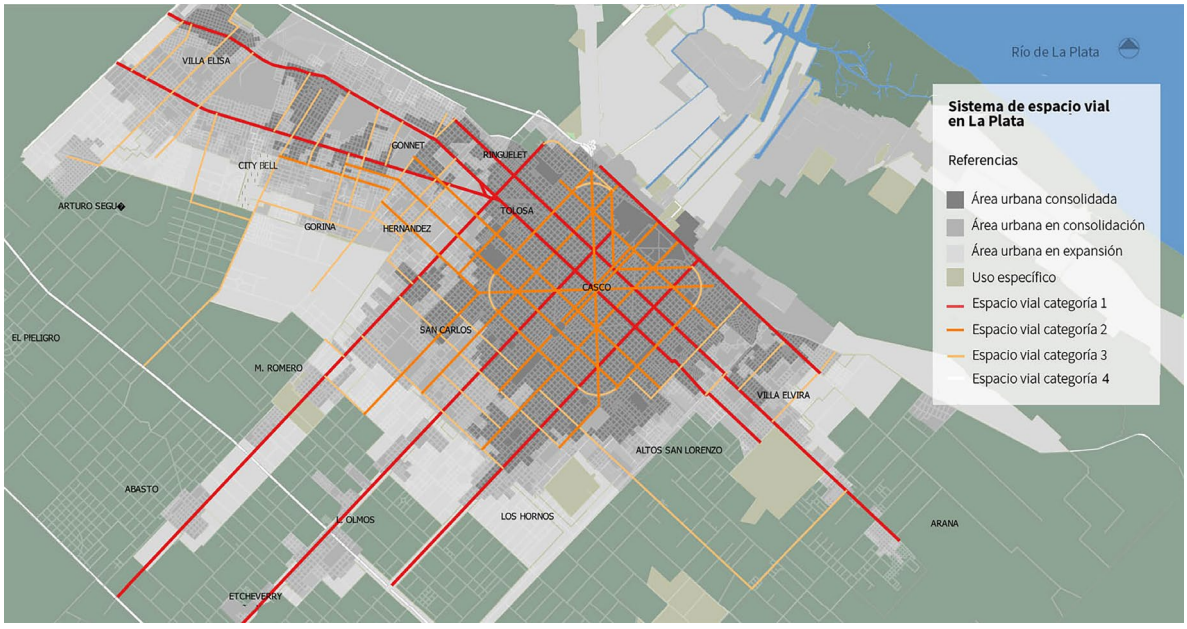


Figure 4. Street spaces by categories in La Plata. Source: Preparation by the Author (2019).

spaces, results in a total of 21.8% of the urban surface dedicated to public space (Birche, 2020). As a reference, it can be mentioned that 50% of the public space is common in successful cities. Manhattan, Barcelona, and Brussels dedicate up to 35% of the city to street space, and an additional 15% for other public uses (UN-Habitat, 2018). In this sense, this study focuses on evidencing the uses and design characteristics of the street space, particularly showing the relevance and characteristics of the pedestrian space. Its quantification allows uncovering the importance it has as an urban public space for the city, especially considering the lack of green public spaces which are well below that recommended (Jensen, 2018). In addition, it can be stated that there is a lack of both official information and research projects that quantify and spatialize, in an updated way, the street spaces at a municipal level, which may (in part) be due to the magnitude of a survey of this size.

IV. METHODOLOGY

As has already been mentioned, this work proposes, on one hand, to generate primary information and, on the other, to build a diagnosis on the design and use of the pedestrian street space. As a starting point to outline the purpose of the study, said spaces are conceived as those "destined to intra and inter-urban connection for the movement of vehicles and pedestrians. These are the basic functional support of urban mobility" (CEP, 2004).

Although this definition does not reflect the complexity of the street space concept, nor all the nuances that can appear on working with it, here it is used on being considered suitable and effective for this research project, as it integrates both functional questions related to the movement of people and aesthetic issues linked to the urban landscape, on mentioning "the enjoyment of pedestrians".

Because of matters related to the practicality of the research, the decision was made to cut the sample of streets being surveyed (Figure 4), starting from a selection of main roads, like the typically transited roads of La Plata, chosen using Google Transit. The choice is also based on the Valencia Green Plan (2011), where it states that "the especially relevant transport infrastructures become landscape routes due to their high frequency of observation".

Regarding this cross-section, the street segments outside the urban area are excluded, and the streets are segmented into 100-meter sections. Then, the georeferenced survey is made using the Google Street View tool, which has images updated between 2014 and 2018. This survey includes:

DIAGNÓSTICO DE DISEÑO Y USO DEL ESPACIO VIAL PEATONAL
APORTES DESDE EL PAISAJE PARA LA CIUDAD DE LA PLATA
MARIANA EVELYN BIRCHE
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 58 - 69
ISSN 0717 - 3997 / 0718 - 3607

Figure 5. Left: Sidewalk that verifies the walkable width. Center: Sidewalk that does not verify the walkable width. Right: Pedestrian space without a sidewalk. Source: Google Street View (2019).

DIAGNÓSTICO DE DISEÑO Y USO DEL ESPACIO VIAL PEATONAL
APORTES DESDE EL PAISAJE PARA LA CIUDAD DE LA PLATA
MARIANA EVELYN BIRCHE
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 58 - 69
ISSN 0717 - 3997 / 0718 - 3607

i) quantitative aspects: dimensions; surfaces occupied for each use; the number of street trees; urban furniture (trash cans, lighting, benches).

For the dimensions of streets, the width and length of each one are taken. Regarding the uses, these are divided into pedestrian use, vehicle use, and the separator use of sidewalks. As for the number of street trees, although a suitable distance for planning urban tree lines will depend on different factors such as the width of the street, of the sidewalk, the height, the space from building facades, and fundamentally, the species being planted; 10 trees every 100 meters is adopted as the verification average **4**. This number is not intended to be understood as a determining factor, but rather a standardized visualization instrument for a rarely viewed problem in the region, namely landscape elements on street spaces.

ii) qualitative aspects: morphological characteristics of the profile, state of the sidewalks, presence of ornamental water features.

A classification is adopted for the morphological characteristics, based on four street types: those with an esplanade (central platforms with urban furniture and equipment); those with a large separator (central platform of more than 1.2 meters without equipment); those with a small separator (central platform of less than 1.2 meters); and ones without a separator. Meanwhile, the state of the sidewalk is classified into three categories (Figure 5), taking the walkable width established in the Global Street Design Guide (NACTO, 2016)

V. RESULTS

The surveying and systematization of the aforementioned data allow making a diagnostic analysis of the uses and design of pedestrian spaces integrating, apart from the traditional dimensions of use and design, the landscape perspective through variables like tree-cover and the presence of water. Initially, it is seen that the street space adopts the following distribution of uses: vehicle, 42.2%; pedestrian, 54.3%; street separator, 3.5%; bike lane, 0.1%. Although the percentage dedicated to pedestrian space is high **5**, in practice it is seen that the state of the sidewalks is often bad or non-existent (leaving only dirt for pedestrians to walk on). This leads to a deficient, inaccessible, and hazardous **6** urban space, especially for the periphery.

More broadly speaking, it was determined that from a total of 591,552 linear meters analyzed, 247,172 meters (41.8%) had no sidewalk, 154,229 (26.1%) did not have the minimum

4 Regarding the recommended amount of trees in the urban environment, an average is taken as reference between the maximum distances suggested by Beytia, Hernández, Musalém, Prieto and Saldías (2012, p.12), who recommend that small trees (under 6m high and species of vertical growth) are distanced between 4 and 6 m from one another; that medium-sized trees (6 to 15 m high), 6 to 8 m from one another; and that large trees, more than 15 m tall, are placed with a separation of between 8 and 12 m.

5 Cities like Amsterdam have a pedestrian use of 40% of their surface, while Berlin and Freiburg have 33% (Gössling, 2016).

6 In recent months, at least 3 people died on important avenues in the Platense periphery (at 7 and 617 in November, at 38 and 25 in September, and at 530 and 173, on July 27th, 2021 as the El Día Newspaper reported), after being struck by hit-and-run drivers. The victims were walking on the street due to the lack of sidewalks.

Figure 6. Verification of sidewalks by walkable width for La Plata. Source: Preparation by the Author (2019).

TIPOS DE ESPACIO VIAL Y PEATONAL		
Con paseo	Avenida con árboles y una plataforma central donde los asientos y el mobiliario de la calle brindan oportunidades frecuentes para que la gente se detenga, contemple y descanse.	
Con separador grande	Avenida con árboles y una plataforma central de más de 1,20 m	
Con separador	Avenida con una zona central de plantación (separador de menos de 1,20 m).	
Sin separador	Calle sin una plataforma central.	

Figure 7. Types of Street Space by profile. Source: Preparation by the Author (2019).

DIAGNÓSTICO DE DISEÑO Y USO DEL ESPACIO VIAL PEATONAL
APORTES DESDE EL PAISAJE PARA LA CIUDAD DE LA PLATA
MARIANA EVELYN BIRCHE
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 58 - 69
ISSN 0717 - 3997 / 0718 - 3607

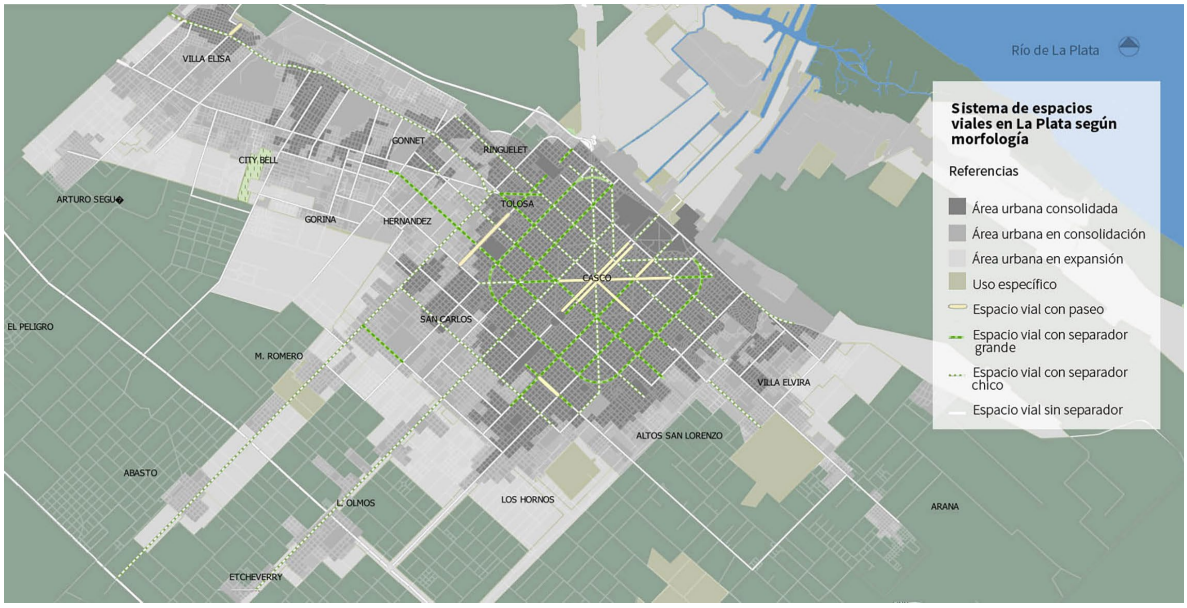


Figure 8. Types of street space by profile in La Plata. Source: Preparation by the Author (2019).

DIAGNÓSTICO DE DISEÑO Y USO DEL ESPACIO VIAL PEATONAL
APORTES DESDE EL PAISAJE PARA LA CIUDAD DE LA PLATA
MARIANA EVELYN BIRCHE
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 58 - 69
ISSN 0717 - 3997 / 0718 - 3607

Figure 9. Public street trees in the street space of La Plata. Source: Preparation by the Author (2019).

width, and 190,151 meters (32.1%) had the minimum width of 1.8 meters. Thus, it can be confirmed that consolidated areas mostly have sidewalks with a walkable width, while areas undergoing consolidation and expansion have sidewalks that do not have the width or simply do not have sidewalks (Figure 6).

Regarding the morphology of street spaces, four types can be seen (Figure 7):

If the distribution of these types is laid out on a map, it is possible to see that there is a higher number of linear meters of streets with vegetation in the foundational hub, compared to the periphery (Figure 8). Outside the hub, there are only 3 sections that correspond to profile 1 (with esplanades) and these are in Los Hornos, Tolosa, and Villa Elisa. The streets of type 2 (with large separator), are found in the periphery, with roads that continue their profile from the foundational hub, like those of Camino Centenario, Avenida 25, 19, and also a sector of 155. With the streets of type 3 (with separator), something similar happens, and many of these continue with a profile consistent with that of the foundational hub. This is the case of the following five: Avenida 7, Avenida 44, 520, Avenida 1, and 143. The remaining streets follow profile type 4 (without separator).

This last surveyed aspect is susceptible to being planned and optimized, alongside a suitable provision of urban tree cover, which would allow setting up the so-called ecological corridors **7**, which would also allow maintaining biodiversity.

After analyzing the public street trees, it can be said that 51.9% of the streets analyzed do not have a minimum threshold of 10 trees every 100 meters and that the sections with less than 10 trees every 100 meters are exclusively in the periphery.
Regarding the presence of ornamental water features within street spaces, it has been possible to confirm that these are few and far between, like the water fountains on the access to the city located at 7 and 32, and 13 and 32. There is also a small fountain on Avenida 51 and 8. Now, in the outskirts of the city, it is possible to see the water of the open streams from the streets and avenues. However, this situation does not aesthetically represent an added value for the city as the works done there have been developed from an engineering point of view, disregarding impacts, landscapes, and the public pedestrian space.

Lighting on category one streets has been thought out for vehicles and, therefore, is located 5 to 9 meters above the ground, often leaving pedestrians with deficient lighting. For categories two and three, this problem is less serious, as on having a lower hierarchy, the lights are lower. Meanwhile, suitable urban furniture only appears in central areas, and subcenters of the city, leaving the rest of the street spaces without any.

VI. DISCUSSIONS

For non-motorized mobility, there is a particular shortage of both official information and studies regarding calculations of pedestrian and bicycle transit and, to a lesser extent, about suitable design conditions for their circulation. The pedestrian has a stand-out place in urban mobility, on both representing the most basic form of circulation that feeds other forms of transportation, and on maintaining a constant and direct relationship with the different activities (Valenzuela-Montes & Talavera-García, 2015). In this sense, the work outlined here makes a methodological contribution of analysis for urban pedestrian spaces and, contributes at the same time, to the generation of new information available for the case study, seeking to make contributions that allow designing pedestrian spaces, not just as spaces of movement, but as places in themselves (Birche, 2020; Nello-Deakin, 2019; Mehta, 2015; Gehl, 2006).

The diagnosis made, emphasizes a disconnected street space system that has been developed from its particular aspects, ignoring the concept of system and that of the landscape too. Interventions have been detected that hint at a preference for the urban area corresponding to the foundational hub over those of the periphery. These data are aligned with the term suggested by Delgadillo (2014), "a-la-carte urbanism". For the case study, from the political and regulatory sphere, no interest can be appreciated to fully solve these problems, as López and Ravella (2019) state, with no valid territorial organization plan or particular plans for public space or mobility. It is for this reason that looking further into the knowledge, surveying, and spatialization of the built environment factors that are most closely connected to the pedestrian is key, both to improve the quality of these environments and to see permanently transforming problems and characteristics associated with the pedestrian space system. In this way, this article contributes to developing new ways to analyze urban design, opening the door to project-based research.

7 The concepts of biological and ecological corridor, are new and evolving. They emerge from landscape ecology, one of the branches of biogeography. They describe ecological landscape structures that have the conditions for the displacement of a species.

DIAGNÓSTICO DE DISEÑO Y USO DEL ESPACIO VIAL PEATONAL
APORTES DESDE EL PAISAJE PARA LA CIUDAD DE LA PLATA
MARIANA EVELYN BIRCHE
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 58 - 69
ISSN 0717 - 3997 / 0718 - 3607

VII. CONCLUSIONS

In summary, the use and state of the pedestrian street spaces in La Plata were reviewed, seeing that their design is directed at motorized transport, coherent with the diffuse growth model. It was confirmed that 67.9% of the urban area does not have sidewalks that guarantee accessibility for people, a percentage that is exclusively outside the foundational hub.

On surveying the morphological of the street space, it was seen that the periphery has few streets with esplanades, separators, and green spaces, which complicates incorporating green corridors and infrastructure. Likewise, it was seen that 51.9% of the streets did not have a minimum threshold of 10 trees every 100 meters.

With variables like the presence of water and street furniture, it was possible to confirm that these cannot yet be connected with the landscape view, as they are erratically spread throughout the pedestrian space without contributing to a functional aesthetic of the city itself and, at the same time, allowing inhabitants to enjoy them.
In this context, it is felt that holistically addressing the problems of the territory is the only possible way to plan and build pedestrian spaces that express, in their design, the qualities and values of the city they represent. It is from this perspective that this study has emphasized the importance of pedestrian transit and its close ties with the landscape, aiming at generating updated information that contributes to generating new design guidelines for pedestrian street space, and diagnostic analyses that uncover the main variables to work on, in order to lead our cities towards a more inclusive, fairer, and more sustainable development, consolidating landscape as a new approach of 21st-century urban praxis.

DIAGNÓSTICO DE DISEÑO Y USO DEL ESPACIO VIAL PEATONAL
APORTES DESDE EL PAISAJE PARA LA CIUDAD DE LA PLATA
MARIANA EVELYN BIRCHE
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 58 - 69
ISSN 0717 - 3997 / 0718 - 3607

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SPATIAL CLASSIFICATION OF URBAN LAND BY SPECULATIVE LAND VALUE

AND MSI SATELLITE IMAGERY USING K-MEANS, IN HUANCAYO, PERU

CLASIFICACIÓN ESPACIAL DEL SUELO URBANO POR EL VALOR ESPECULATIVO DEL SUELO E IMÁGENES MSI SATELITALES USANDO K-MEANS, HUANCAYO, PERÚ

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REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 70 - 83
ISSN 0717 - 3997 / 0718 - 3607

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La ciudad de Huancayo, como otras ciudades intermedias en Latinoamérica, enfrenta problemas de cambios de uso de suelo poco planificados y una acelerada dinámica del mercado del suelo urbano. La escases y desactualización de información sobre el territorio urbano impiden la adecuada clasificación de áreas urbanas, limitando la forma de su intervención. Esta investigación tuvo como objetivo la incorporación de métodos no asistidos y mixtos para la clasificación espacial de zonas urbanas considerando el valor especulativo del suelo, la proporción del suelo urbanizado y otras variables geoespaciales. Entre los medios de recolección de datos, se usó imágenes Multi-Espectrales (MSI) del satélite Sentinel-2, el sistema vial primario y una muestra de puntos de observación directa. Los datos procesados fueron incorporados en mapas georreferenciados, a los cuales se añadió además los límites urbanos y pendientes oficiales. Durante el procesamiento de los datos se empleó el algoritmo K-Means, junto a otros métodos de *machine learning* y juicio asistido. Como resultado, se obtuvo una caracterización objetiva de zonas urbanas que difiere de la planificación existente.

Palabras clave: planificación urbana, mercado inmobiliario, periferia urbana, inteligencia artificial

The city of Huancayo, like other intermediate cities in Latin America, faces problems of poorly planned land-use changes and a rapid dynamic of the urban land market. The scarce and outdated information on the urban territory impedes the adequate classification of urban areas, limiting the form of its intervention. The purpose of this research was the adoption of unassisted and mixed methods for the spatial classification of urban areas, considering the speculative land value, the proportion of urbanized land, and other geospatial variables. Among the data collection media, Multi-Spectral Imagery (MSI) from the Sentinel-2 satellite, the primary road system, and a sample of direct observation points, were used. The processed data were incorporated into georeferenced maps, to which urban limits and official slopes were added. During data processing, the K-Means algorithm was used, together with other machine learning and assisted judgment methods. As a result, an objective classification of urban areas was obtained, which differs from the existing planning.

Keywords: urban planning, real estate market, urban periphery, artificial intelligence.

I. INTRODUCTION

Intermediate cities face land sale and value speculation processes that define the urban shape more quickly than intervention by local governments. Urban land value prioritizes the demand of private agents (Gasic, 2018), even though the State sets the limits of this action (Sabatini & Arenas, 200). Thus, socio-spatial segregation is related to the willingness of the market and inadequate policies, molding the excess demand or supply of the property market, and generating a disperse standard of urban life (Saleh, Hwa & Majid, 2016; López Navarrete & Peña Medina, 2017; Li, Sun & Boersma, 2019). Facing this, land regulation and its application can promote or stop the development of emerging urban areas (Yu, Zhou & Yang, 2019). These conditions are common in Latin American cities with limited public action (Sabatin & Arenas, 2000). Among the causes, clientelist practices are seen, the result of failures in free-market practices, private interests, illegal conditions, ambiguous regulations, and a generalized popular acceptance (Pimentel Sánchez, 2020; Espinoza & Fort, 2017).

Land value, the most important indicator of property market dynamics, is not easy to estimate or predict, although it is common that consolidated areas are overvalued, making the periphery more attractive due to its low price (Glaeser & Ward, 2009; García & Peralta, 2016; Gasparenienea, Venclauskienea & Remeikiene, 2014). In the long term, land market behaviors can come close to time series (Gaete, 2021). However, an approach with heterogeneous data, or scenarios of high uncertainty, can use artificial intelligence to classify them (Durduran, 2015; Belhadia *et al*., 2020; Forestier & Wemmer, 2016). The K-Means algorithm has been useful and highly adaptable to classify images, study urban growth, and for spatial analysis (Liu *et al*., 2021; Belhadia *et al*., 2020).

Peru is in its bicentenary and is facing major economic and social challenges. The National Housing and Urbanism Policy considers the low impact of urban-territorial planning and the limited use of regulatory compliance a major problem (Ministry of Housing, Construction, and Sanitation [MVCS in Spanish], 2021). Property market processes, formal, illegal, or under mixed setups, are also common in Peruvian cities (Espinoza & Fort, 2017; Pimentel Sánchez, 2020). Even though the portfolio of support funds for housing, like the Mivivienda Fund (FMV, in Spanish), multiply, their implementation is limited by adverse urban conditions and land value (Calderón, 2015). During the property boom of 2018 to 2019, at least 70% of district municipalities did not have urban development plans (FMV, 2018a; FMV, 2018b). In Huancayo, the main city in the heart of Peru, the Provincial Municipality of Huancayo (2016) proposes development based on sustainable and inclusive principles, but that requires knowledge of the local urban reality and its objective characterization.

The purpose of this article is to spatially classify the urban areas in the city of Huancayo using heterogeneous data. The research proposes the differentiated classification of urban areas, incorporating unassisted and mixed methods, and considering the speculative value of the land on the property market, the proportion of developed land, the distance from main roads, and the slope of the land. The work was carried out in four connected stages: (1) construction of base maps; (2) processing of satellite images to analyze current land occupation; (3) application of machine learning methods for classification; and (4) polygonal classification of the urban areas of the city of Huancayo.

II. THEORETICAL FRAMEWORK

Urban planning and the property market

Due to population growth, better city planning represents an ongoing issue worldwide (Mouratidis, 2021). This issue has captured national attention to promote its development from a sustainable approach (Aceid & Fundación ACS; 2018; United Nations, 2018; Castillo-García, 2021), although during the pandemic, its reduced presence stood out (Moreno, Allam, Chabaud, Gall & Pratlong, 2021). Thus, in this context, a revision of the idea of proximity in the urban economy, linked to the generation of land value, is needed (Tricaricoa & De Vidovich, 2021).

Urban planning requires a balance between land use and urban expansion, which is not always aligned with the real ways of life and the behavior of the property market (López Navarrete & Peña Medina, 2017). There is a gap between the sustainable generation of urban space and the real practices in peri-urban areas adjoining rural areas and natural spaces, that are quickly being devastated by formal and informal urbanization processes (Carvajal, Moreira, Salazar, Leguia & Jorquera, 2019).

Socio-spatial segregation is related to the willingness of the property market and inadequate policies, and directly affects urban planning (López Navarrete & Peña Medina, 2017; Glaeser & Ward, 2009; Migueltorena & Lan, 2013). Excess supply or demand of the property market and dispersion generate variations in living standards (Saleh

CLASIFICACIÓN ESPACIAL DEL SUELO URBANO POR EL VALOR ESPECULATIVO DEL SUELO E IMÁGENES MSI SATELITALES USANDO K-MEANS, HUANCAYO, PERÚ
GONZALO RODOLFO PEÑA ZAMALLOA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 70 - 83
ISSN 0717 - 3997 / 0718 - 3607

et al., 2016). Fluctuations in land value, urban growth, and initial density condition these variations (Glaeser & Ward, 2009; Li *et al*., 2019).

In the growth stage of the sector, many of the rules that guide market actions are not easy to adapt to the management instruments, widening the gaps in urban planning (Glaeser & Ward, 2009). Among these, regulations of access to formal urban services have been made worse (Baer & Kauw, 2016). These disparities can be insurmountable, with repercussions on the generation of new policies and tax collection (Hindi, Moreira & Rossi, 2020; Foldvary & Minola, 2017). In addition, land value has greater variability than the buildings (Kok, Monkkonen & Quigley, 2014). As a result, this value cannot be suitably allocated for its use in regulations, mortgages, and loans, as its real fluctuation is characterized by speculation (Hwang, Park & Lee, 2013; Gasparenienea *et al*., 2014; Foldvary & Minola, 2017).

The need for development land and land value

Having a dwelling is one of the most important aspects of peoples' lives (Saleh *et al*., 2016). Those financed with social funds promote real estate investment and have great interest in the availability of undeveloped sites (Scotiabank, 2015; FMV, 2018c). However, the value of vacant urban land is subject to speculation with lower prices in peri-urban areas (Gedal & Ellen, 2018; Parias, 2008), which promotes exclusion on increasing physical distance and price (Gaete, 2021; Klaufus, Van Lindert, Van Noorloos & Steel, 2017). In this way, an incremental cycle of speculated value is entered which impedes reaching more homogeneous conditions (Amézquita, Rodríguez & Murillo, 2015; Gaete, 2021; Gasic, 2018; Araque Solano & Caballero Quintero, 2009; Glaeser & Gyourko, 2003).

The level of consolidation and proximity to roads are undeniable attractions of urban land (Peña-Zamalloa, 2018; Gedal & Ellen, 2018): Agricultural spaces with road access are, as a result, targets for change of land use (Salazar, 2014; Cardó, 2017; Migueltorena & Lan, 2013). On being informal lots, self-builds are prioritized, with the goal of reducing housing costs while disregarding long-term effects (GRADE, 2020; Salazar, 2014). The ongoing search for greater profit from land sales undermines the positive popular intention of urban planning (Delgadillo, 2016; Araque Solano & Caballero Quintero, 2009). Rapid price changes generate, in the territory, a disorganized and low-density occupation, even when social housing is promoted (Calderón, 2015). This affects the rural and natural environment and complicates access to urban services for spread-out areas, as well as regulatory compliance (Carvajal *et al*., 2019; Li *et al*., 2019). This reality flies in the face of the compact city (Vorontsova, Vorontsova & Salimgareev, 2016).

Low-density urban sprawl involves high costs in urban infrastructure (Nabil & Eldayem, 2015). Facing this outlook, an optimal urban model prioritizes accessibility and leads to short distances to multiple urban centers, and a reduction in mobility times (Yu *et al*., 2019; Gedal & Ellen, 2018; Graells-Garrido, Serra, Rowe, Cucchietti & Reyes *et al*., 2021). The idea of chronological urbanism is, in fact, an attempt to improve the quality of life of inhabitants on diverse geographical scales (Moreno *et al*., 2021; Graells-Garrido *et al*., 2021).

The characterization of urban land and the K-Means method

Little understood urban sprawl processes, without an articulated systemic analysis, occur randomly and go against the capacity of generating compact cities (Vorontsova *et al*., 2016, Alfasi & Migdalovich, 2020). In addition, the metrics tend to be single-dimensional (Tellier, 2020), when urban complexity requires using multidimensional analysis metrics for its classification (Steurer & Bayr, 2020; Tellier, 2020). Machine learning offers an alternative for clustering using heterogeneous data (Joshi, 2020). This classification can be assisted, unassisted, or mixed (Liu *et al*., 2018; Steurer & Bayr, 2020).

Specifically, K-Means is one of the most used unsupervised classification algorithms in images, random data, and unlabeled data (Liu *et al*., 2018; Zhou *et al.,* 2017). This algorithm allows generating clusters, grouping data under similar traits (Campesato, 2020), and differentiating elements like vegetation, vacant urban spaces, and even rural uses (Feng, Peng & Wu, 2020). Although the hierarchical cluster analysis, mobile mean, and maximization of expectations could be considered as being suitable alternatives, the use of a Euclidean distance allows that the classification made with K-Means can be overlapped to two-dimensional coordinates, and is suitable for geographic settings (Campesato, 2020; Joshi, 2020; Liu *et al*., 2018).

III. CASE STUDY

The city of Huancayo is in the central part of the country. Its geography is molded by the Mantaro River, and it constitutes one of the widest valleys in the Peruvian Andes, with a high capacity of development land that competes with rural land. The geographic scope of the study presented here, considered the Huamancaca

CLASIFICACIÓN ESPACIAL DEL SUELO URBANO POR EL VALOR ESPECULATIVO DEL SUELO E IMÁGENES MSI SATELITALES USANDO K-MEANS, HUANCAYO, PERÚ
GONZALO RODOLFO PEÑA ZAMALLOA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 70 - 83
ISSN 0717 - 3997 / 0718 - 3607

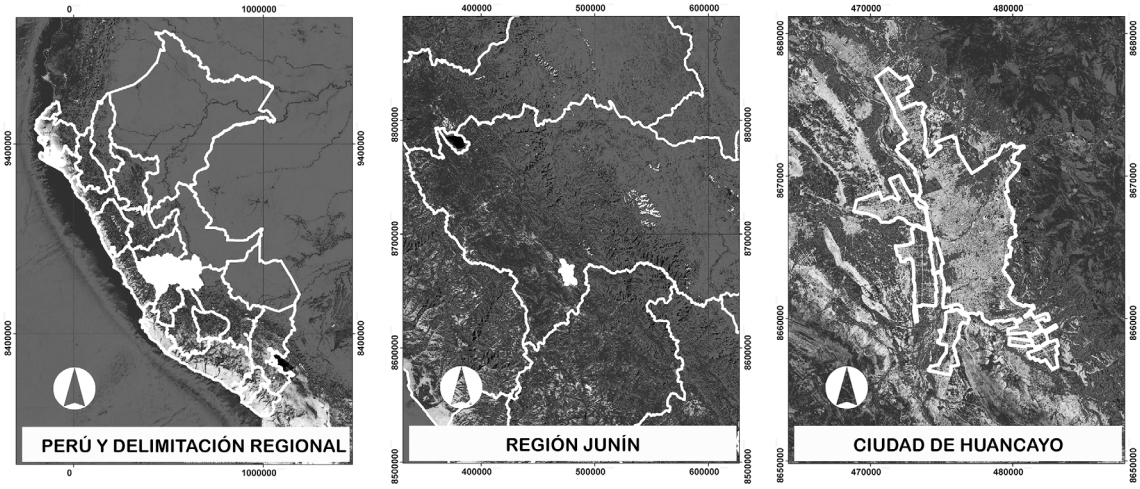


Figure 1. Location of the study area. Source: Preparation by the Author.

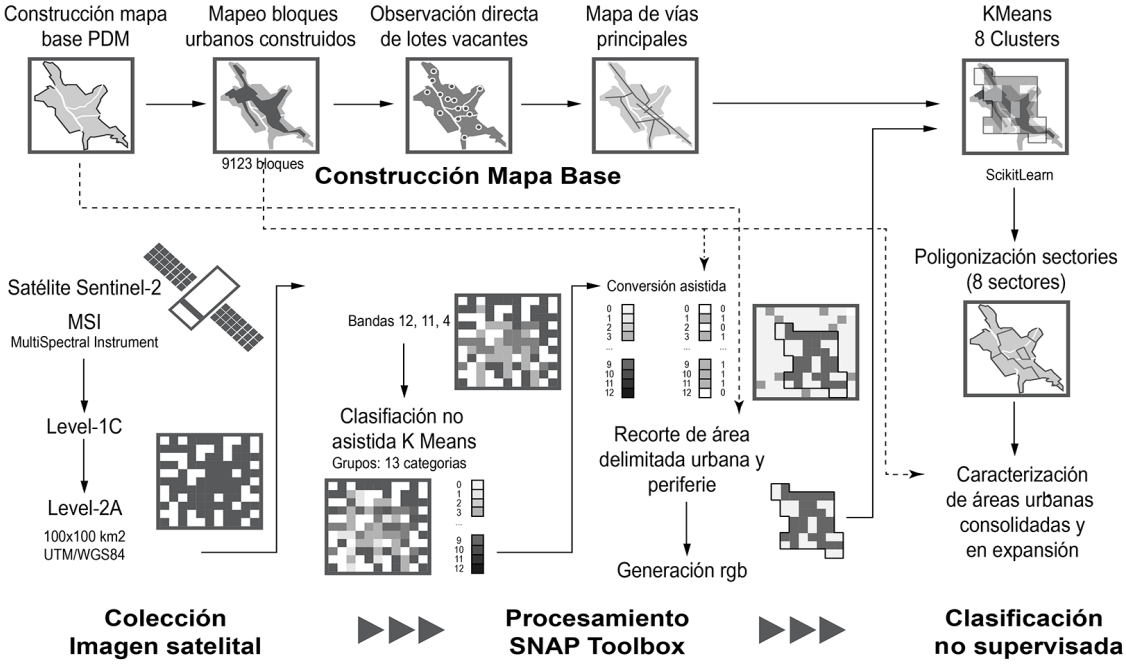


Figure 2. Data processing and collection methodology. Source: Preparation by the Author.

CLASIFICACIÓN ESPACIAL DEL SUELO URBANO POR EL VALOR ESPECULATIVO DEL SUELO E IMÁGENES MSI SATELITALES USANDO K-MEANS, HUANCAYO, PERÚ
GONZALO RODOLFO PEÑA ZAMALLOA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 70 - 83
ISSN 0717 - 3997 / 0718 - 3607

Dimension	Variable	Values
Geography	Slope of the land	Slope percentage.
	X Coordinate	UTM East
	Y Coordinate	UTM North
Urban road	Distance to the road	Distance in meters (m) to the closest road of the highway system
Urban occupation	Proportion of area occupied	Area occupied by buildings in a radius of 400 m / Area of blocks projected in a radius of 400m
Urban boundary	Distance to the urban boundary	Distance in meters (m) to the closest point of the projected urban boundary.
Land price	Land price offered by m2	Land price per meter squared (m2)

Table 1. Variables considered for the K-Means classification. Source: Preparation by the Author.

and 3 de Diciembre districts, of the adjoining Chupaca province, along with the districts of Pilcomayo, Chilca, Sapallanga, Huancán, El Tambo, and Huancayo in the Province of Huancayo, given their geographic location on the right bank of the river, and the direct connection they have with the city. The location is shown in Figure 1.

IV. METHODOLOGY

Data collection was made from different sources: direct observation, satellite images, and maps. These methods were digitalized and processed using geographic information systems, QGIS 3.12, SNAP Toolbox v8.9, scikit-learn 0.24 library, and others in python. The processing sequence can be seen in Figure 2, from the construction of the base map to the final generation of the urban sector polygons.

Following this, the image produced by the Multispectral Instrument (MSI), of the Sentinel-2 satellite, Level 2A product was used, which provides a reflectance image of the atmospheric background derived from the association of Level 1C, in an area comprising 100 x 100 km^2, under a URM/WGS84 cartographic projection. Resizing was needed for a suitable overlapping and re-projection. Thus, the images were processed with the SNAP v8.0 software, resizing the image for bands 12, 11, and 4, through which an rgb false-color image was generated. Once the bands were isolated, a classification was generated using the unsupervised K-Means classification algorithm. The number of categories was set after examining the results of between 3 and 15 categories, with 13 categories best expressing the land-use diversity.

The mapping of the consolidated urban blocks was a semi-manual task of identifying vacant polygons within the proposed urban boundary, developed on the projected blocks of the Metropolitan Development Plan and real color satellite images. The mapping of the peripheries considered a minimum lot size of approximately 100m^2, similar to the 107m^2 proposed by the FMV (2018c). 9123 blocks were identified with a total of 34.22 km^2, which represents 33.12% of all the urban territory considered, which was 103.32 km^2. This block definition allowed a characterized comparison of the areas of the satellite image. The main roads were identified based on existing plans in the repository of the Ministry of Transport and indicated in the Metropolitan Development Plan. Likewise, the slopes processed from the curves defined in the national charter were used, which were expressed in percentages. After this, the information was collected from 228 valid lots of a total of 273 calculated for a simple sample, NC=90%, E=5%, p=50%. The observation points were spread randomly on the plain in an amount proportional to the population density shown in the current plan. The characteristics of the observation points that were considered, are detailed in Table 1 and have been used as characteristics to determine the classification of urban areas through a K-Means algorithm, implemented with the scikit-learn library.

V. RESULTS

The Level 2A product image is shown in Figure 3, captured and processed in false color rgb, using bands 11, 12, and 4, respectively. With this, it is possible to differentiate, in a color between yellow and violet, the possible built

CLASIFICACIÓN ESPACIAL DEL SUELO URBANO POR EL VALOR ESPECULATIVO DEL SUELO E IMÁGENES MSI SATELITALES USANDO K-MEANS, HUANCAYO, PERÚ
GONZALO RODOLFO PEÑA ZAMALLOA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 70 - 83
ISSN 0717 - 3997 / 0718 - 3607

CLASIFICACIÓN ESPACIAL DEL SUELO URBANO POR EL VALOR ESPECULATIVO DEL SUELO E IMÁGENES MSI SATELITALES USANDO K-MEANS, HUANCAYO, PERÚ
GONZALO RODOLFO PEÑA ZAMALLOA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 70 - 83
ISSN 0717 - 3997 / 0718 - 3607

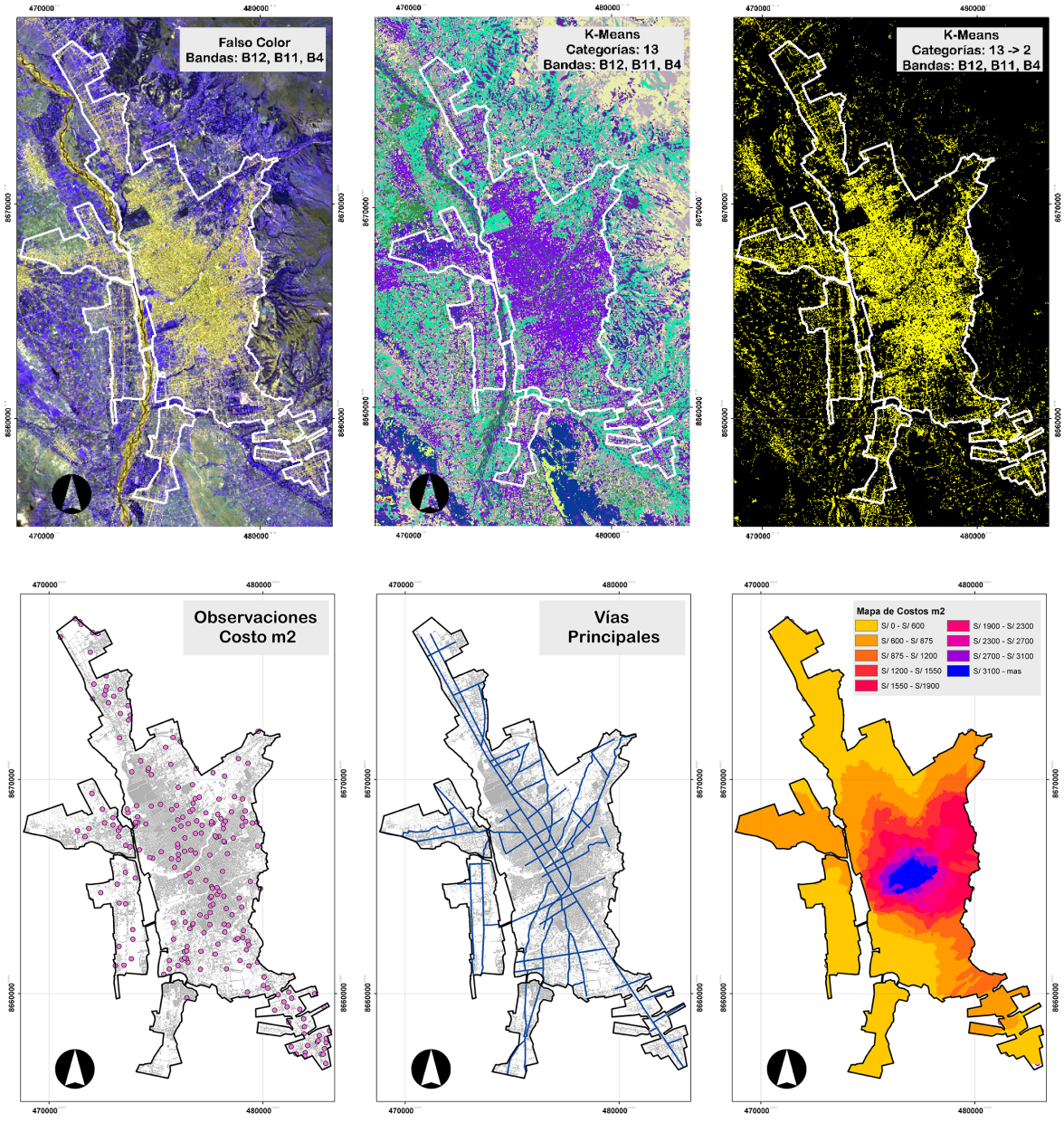
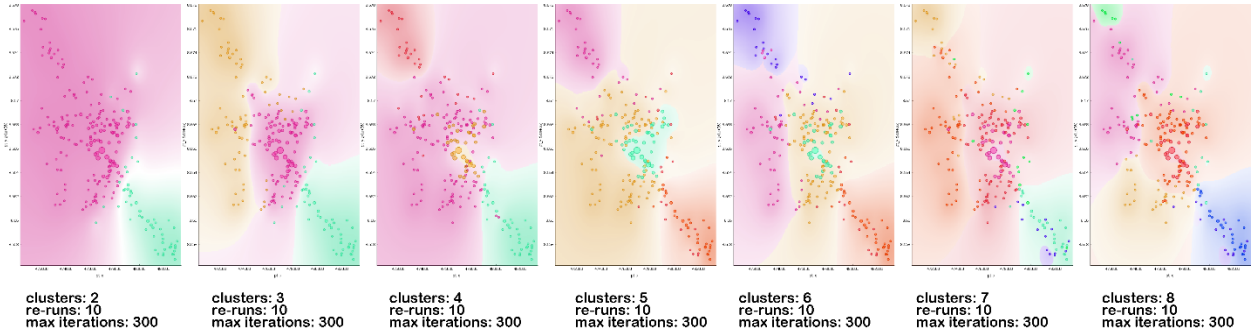


Figure 3. Identification and classification of satellite images using K-Means. Source: Preparation by the Author.
Figure 4. Sampling points, roads, and land value map. Source: Preparation by the Author.

areas and other lands. To generate a scale that can be manually discriminated, the false color was clustered in 13 categories using the K-Means algorithm. Then, each cluster was labeled as built or not built, reducing the results to 2 categories, which are distinguished in yellow and black. As other types of land tend to be confused, just the boundary of urban expansion was considered, improving the accuracy of the result. The occupied urban land percentage of the buffers defined later was calculated using the third image.

The distribution of the sampled points observed is seen in Figure 4, distributed randomly in the occupied area: the main road network indicated in existing plans, both



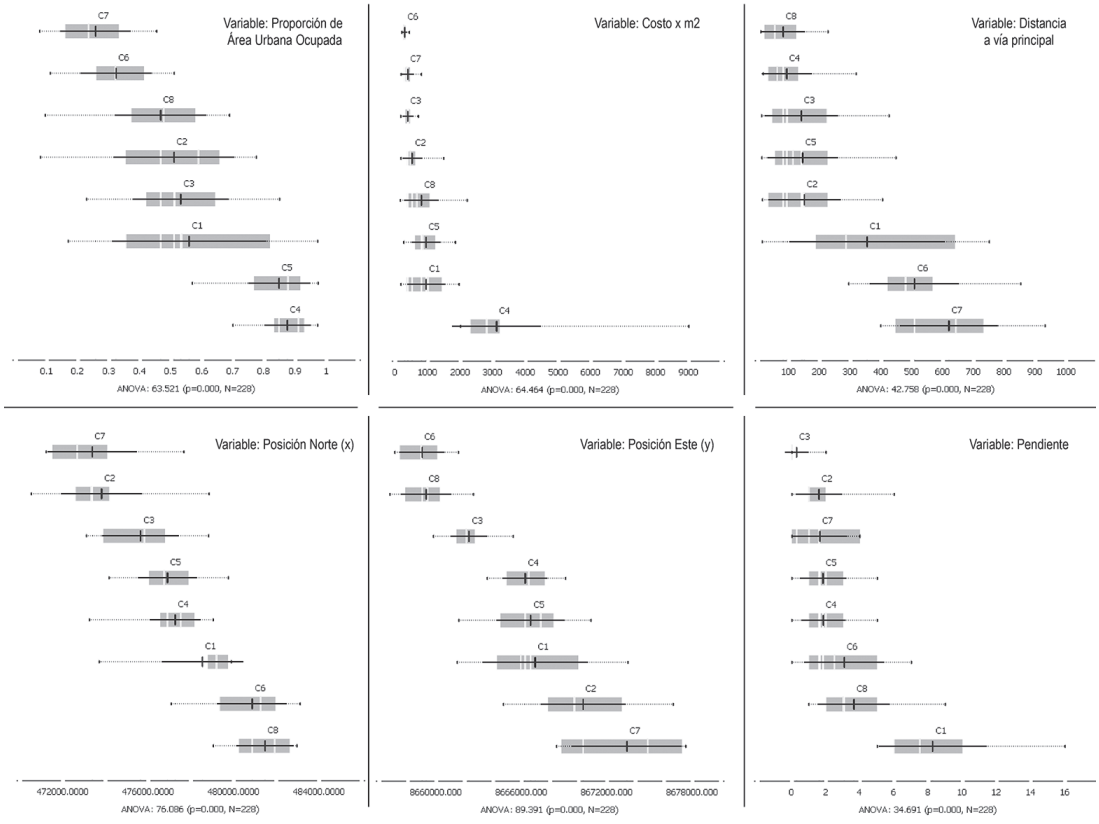


Figure 5. Classification using the unsupervised K-Means algorithm to generate centroids. Source: Preparation by the Author.
Figure 6. Comparative view between clusters for each variable of the model. Source: Preparation by the Author.

overlapped on the map of consolidated urban blocks and those being developed. With the offered land price data per m^2, a DEM image was projected, using a 9-category Jenks optimization division classification. These tasks were carried out using the QGIS 3.12 software tool.

Using a 400 m diameter buffer, which was used as the center for the observation points, the distance to the closest main road, the cost per m^2 offered, the slope, the percentage of urban area occupied, and its geographic location reference were averaged. The K-Means algorithm was fed using these data, implemented with the scikit-learn library. Fixed

Variable	Cluster	Statistic	Cluster						
			C2	C3	C4	C5	C6	C7	C8
Percentage of occupied area	C1	D. mean D. media			-0.3166	-0.2898		0.3008	
		P			0.0202	0.0358		0.0355	
	C2	D. mean			-0.3648	-0.338	0.1873	0.2526	
		P			< .0001	< .0001	0.0024	0.0002	
	C3	D. mean			-0.3432	-0.3164	0.2088	0.2742	
		P			< .0001	< .0001	0.0007	< .0001	
	C4	D. mean					0.552	0.6174	0.4076
		P					< .0001	< .0001	< .0001
	C5	D. mean					0.5253	0.5906	0.3808
		P					< .0001	< .0001	< .0001
	C6	D. mean							-0.1444
		P							0.0457
	C7	D. mean							-0.2098
		P							0.0033
Slope	C1	D. mean	6.6591	7.9643	6.4113	6.4246	5.1786	6.6136	4.5833
		P	0.0003	< .0001	0.0004	0.0005	0.0042	0.0002	0.0084
	C2	D. mean		1.3052					-2.0758
		P		< .0001					0.0033
	C3	D. mean			-1.553	-1.5397	-2.7857		-3.381
		P			< .0001	< .0001	0.0134		< .0001
	C4	D. mean							-1.828
		P							0.0163
	C5	D. mean							-1.8413
		P							0.0105
Distance to main road	C2	D. mean					-357.389	-469.3501	
		P					< .0001	< .0001	
	C3	D. mean					-367.0552	-479.0163	
		P					< .0001	< .0001	
	C4	D. mean					-414.7302	-526.6912	
		P					< .0001	< .0001	
	C5	D. mean					-363.2758	-475.2369	
		P					< .0001	< .0001	
	C6	D. mean							427.3883
		P							< .0001
	C7	D. mean							539.3494
		P							< .0001

CLASIFICACIÓN ESPACIAL DEL SUELO URBANO POR EL VALOR ESPECULATIVO DEL SUELO E IMÁGENES MSI SATELITALES USANDO K-MEANS, HUANCAYO, PERÚ
GONZALO RODOLFO PEÑA ZAMALLOA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 70 - 83
ISSN 0717 - 3997 / 0718 - 3607

Cost m2	C1	D. mean			-2159.2823		659.3929		
		P			< .0001		0.0364		
	C2	D. mean			-2587.4413	-426.6631	231.2338		
		P			< .0001	< .0001	0.0003		
	C3	D. mean			-2718.6751	-557.8968			-410.8929
		P			< .0001	< .0001			0.0223
	C4	D. mean				2160.7783	2818.6751	2725.8504	2307.7823
		P				< .0001	< .0001	< .0001	< .0001
	C5	D. mean					657.8968	565.0722	
		P					< .0001	< .0001	
	C6	D. mean						-92.8247	-510.8929
		P						0.6962	0.0024
	C7	D. mean							-418.0682
		P							0.0303

Table 2. Games-Howell Test. Source: Preparation by the Author.

parameters of 10 re-runs and 300 iterations were used for a range of 2 to 8 clusters. These are presented in Figure 5, using the UTM east and north coordinates as x and y, respectively.

To validate the differences between the resulting clusters, ANOVA tests were run, all of which were significant with a value of $p<0.001$. The differences in the distribution of the values are shown in Figure 6, through box charts, with a reference to the F statistic of each test. Meanwhile, the significant differences between groups, made with the Games-Howell post-hoc test, are illustrated in Table 2.

Differences between clusters (C) by variable are identified in Figure 6. The geographic location is significantly different for all clusters. The proportion of occupied urban area, for C7 and C6 is less than 0.5, and for C4 and C5 is above 0.7. The cost per m^2 for C4 is highly variable and greater than the other clusters. This is followed by C1, C2, and C8. The distance to the closest main road gives a range below 200 m for C8 and C4; less than 300 m for C3, C5, and C2; between 400 and 800 m for C6 and C7; and of 100m to 800m for C1. A slope above 5% is seen in C1, and less than 5% in the other clusters.

Table 2 allows identifying significant differences between paired clusters. The proportion of occupied urban area is significantly different between C1 and C4, C5 and C7; between C2 and the interval that runs from C4 to C7; between C3 and the interval that runs from C4 to C7; between C4 and C6, C7 and C8; between C5 and C6, C7 and C8; between C6 and C8; and between C7 and C8. Meanwhile, the slope is significantly different between C1 and the interval from C2 to C8; between C2 and C3 and C8; between C3 and C4, C5, C6 and C8; between C4 and C8; and between C5 and C8. The distance to the main road is significantly different between C2 and C6 and C7; between C4 and C6 and C7; between C5 and C6 and C7; between C6 and C8; and between C7 and C8. Finally, the cost per m^2 is significantly different between C1 and C4 and C6; between C2 and the interval from C4 to C6; between C3 and C4, C5 and C8; between C4 and the interval from C5 to C8; between C5 and C6 and C7; between C1 and C7 and C8; and between C7 and C8. Overall, significant differences were identified in all the variables.

Once the significant differences between adjoining clusters were validated, the urban polygons overlapped with the centroids, and the areas presented in Figure 5 were marked out. The resulting map is presented in Figure 7 at a block level, distinguishing the consolidated ones and those that are being developed.

VI. DISCUSSIONS

The research used a model that prioritizes the percentage of area occupied by buildings, in contrast to Liu *et al*., (2018) and Steurer and Bayr (2020), who use population growth based on a close density. In all the cases, the K-Means algorithm made multidimensional

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ISSN 0717 - 3997 / 0718 - 3607

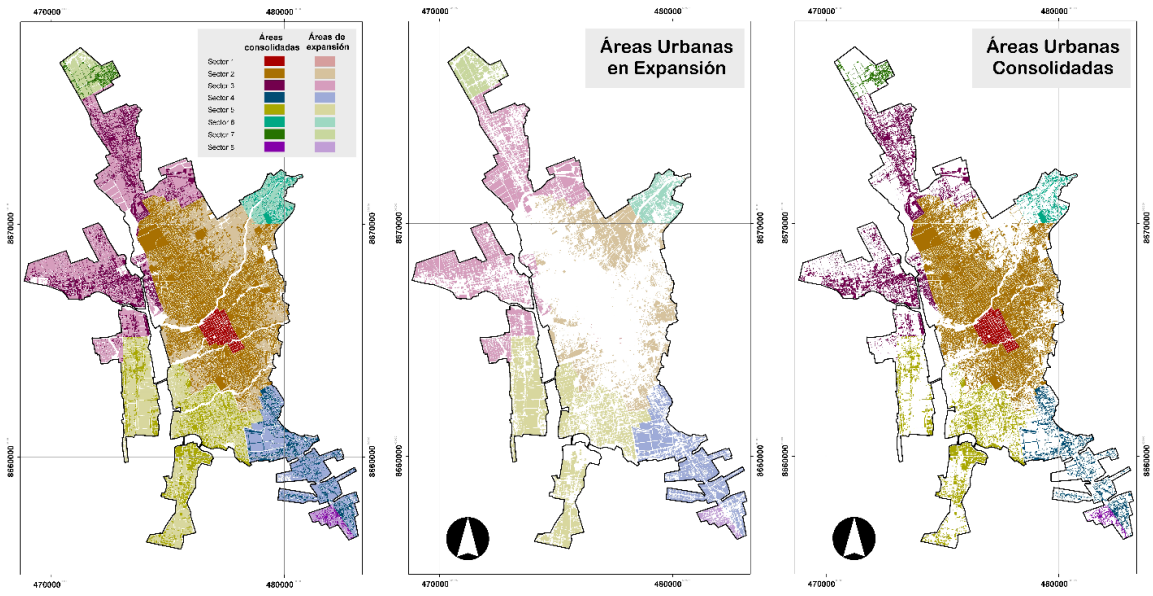

Figure 7. Characterization polygons of the resulting urban areas. Source: Preparation by the Author.

CLASIFICACIÓN ESPACIAL DEL SUELO URBANO POR EL VALOR ESPECULATIVO DEL SUELO E IMÁGENES MSI SATELITALES USANDO K-MEANS, HUANCAYO, PERÚ
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PÁG. 70 - 83
ISSN 0717 - 3997 / 0718 - 3607

classification possible. In this sense, Steurer and Bayr (2020) propose means that can be complemented with the results for future research. Regarding the fit of image-based data sources, noise was found in the urban land classification. However, its reduction did not follow the parameters of Zhou *et al.* (2017), but rather the classified layers were reduced until obtaining an image with data of 2 values, which represent the occupied land.

Considering that the spatial behavior of urban phenomena is complex and uncertain (Pickard & Meentemeyer, 2019), changes are required to suitably study them. For this reason, the urban boundaries that had been defined by MPH (2016) had to be adjusted manually to be able to address peri-urban expansion areas and annex adjoining districts on the left bank of the Mantaro River. After generating the cluster classification, the marked-out polygons of the MPH proposal (2016) maintain a variation contrast that could be considered in future urban plans. In this aspect, it must be remembered that the complex reality demands flexibility when it comes to setting urban boundaries, and not just their political and administrative consideration (Steurer & Bayr, 2020).

The development of the urban sprawl in Huancayo is diffuse and low density: the differences between clusters identified with the Games-Howell test reveal that the areas around the center, C1 and C2, have a higher proportion which is different to all the other 6 clusters and that this difference extends to the price, which is extremely high in C1 and C2, and less in C3, but more similar for the rest. This behavior is similar to the occupation pattern where a constant lower price and the disproportionate valuation of it in the areas near consolidated urban areas is sought (Baer & Kauw, 2016; Gasic, 2018). The form of growth in Huancayo seems to go against the ideal vision of a chronological development proposed by Graells-Garrido *et al*. (2021) and Moreno *et al*. (2021). The growing distance of the centralized urban services and deficient transport must be priority issues (Vorontsova *et al*., 2016).

Just as Araque Solano and Caballero Quintero (2009) state, the prices in informal markets present their formalization under similar conditions as consolidated sectors. In the city of Huancayo, this variation is distinguished in the adjoining areas of C2 and C3 that close a consolidation process at a higher price. The fractioning identified could be linked to the limited participation of the public sector in market control (López-Navarrete & Peña-Medina, 2017). This rapid increase in the periphery price that follows a capital increase is a common situation in other scenarios like those analyzed by Amézquita, Rodríguez, and Murillo (2015), Gaete (2021), or Gasic (2018). Apart from this, the regulatory effects and specific or individual economic

interventions like State policy have to be added (Li *et al.*, 2019; Garza Puentes & Tovar Vanegas, 2009).

VII. CONCLUSIONS

This research identifies that the K-Means algorithm provides a viable way of classifying urban land using heterogeneous variables and that the difference between the generated clusters, can be tested as multivariate and differentiated through open data. From this classification, spatial fractioning is identified in the city of Huancayo which is mainly determined by the variables, proportion of occupied land, offered price, and distance to the main road system.

Although unassisted characterized is subject to opinion, the situation that urban sprawl in Huancayo has been experiencing must be highlighted, outlining alternatives for a more objective analysis of its occupation, taking advantage of the available means of analysis that there are.

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CLASIFICACIÓN ESPACIAL DEL SUELO URBANO POR EL VALOR ESPECULATIVO DEL SUELO E IMÁGENES MSI SATELITALES USANDO K-MEANS, HUANCAYO, PERÚ
GONZALO RODOLFO PEÑA ZAMALLOA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 70 - 83
ISSN 0717 - 3997 / 0718 - 3607

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GENTRIFICATION IN THE MONTERREY METROPOLITAN CENTER, 2010-2020

GENTRIFICACIÓN EN EL CENTRO METROPOLITANO DE MONTERREY, 2010-2020

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GENTRIFICACIÓN
EN EL CENTRO METROPOLITANO DE MONTERREY, 2010-2020
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REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
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El objetivo del siguiente estudio es identificar áreas posiblemente gentrificadas o en proceso de gentrificación mediante una tipología localizada de dos componentes, el rejuvenecimiento e incremento en la calidad de vida. Esta tipología puede ser aplicada en investigaciones similares. El escrito aborda el caso del Centro Metropolitano de la Ciudad de Monterrey (CMM), Nuevo León, México. Los planes actuales de regeneración urbana y aumento de densidad habitacional en el CMM han ocasionado un "boom" inmobiliario vertical de torres departamentales y potencializado el surgimiento de un proceso de gentrificación de la zona, entendido aquí como la disminución del rezago social (incremento en la calidad de la vida) a través del tiempo, con aumento de jóvenes adultos (25 a 34 años) respecto a los adultos mayores (60+ años). El artículo sugiere un procedimiento para medir la gentrificación mediante el cruce del Índice de Rezago Social (IRS) al nivel de cada Área Geoestadística Básica (AGEB) con un índice de rejuvenecimiento al nivel de secciones electorales en el periodo 2010 – 2020. Ambos, la disminución del rezago social (2010-2020) y el rejuvenecimiento (2010-2020), se articulan analíticamente en años censales sucesivos para generar una tipología localizada del proceso de gentrificación.

Palabras clave: gentrificación, rejuvenecimiento, Monterrey, rezago social, tipología localizada.

The purpose of the study is to identify areas that are possibly gentrified or in the process of being gentrified, through a localized typology of two components: youthification and an increase in the quality of life. This typology can be applied in similar investigations. Thisd paper addresses the case study of the Metropolitan Center of the City of Monterrey (CMM), Nuevo León, Mexico. The current urban regeneration plans and the increase of housing density in the CMM have caused a vertical real estate "boom" of apartment buildings and have strengthened the emergence of gentrification in the area, understood here as the decrease in social backwardness (increase in the quality of life) over time, with an increase in young adults (25 to 34 years-old), compared to older adults (60+ years-old). This article suggests a procedure to measure gentrification by overlapping the Index of Social Backwardness (ISB) at the Basic Geostatistical Area (AGEB) level, with a youthification index at the electoral section level between the 2010-2020 period. Both the decline of social backwardness (2010-2020) and youthification (2010-2020), are analytically articulated for successive census years, to generate a localized typology of the gentrification process.

Keywords: gentrification, youthification, Monterrey, social backwardness, localized typology.

GENTRIFICACIÓN
EN EL CENTRO METROPOLITANO DE MONTERREY, 2010-2020
LUIS FERNANDO CAMPOS SÁNCHEZ, JESÚS A. TREVIÑO C
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 84 - 97
ISSN 0717 - 3997 / 0718 - 3607

I. INTRODUCTION

Cities are changing daily, and one of the social phenomena that are emerging from this urban transformation, is gentrification, a complex process that involves many aspects related to the displacement of low-income social groups through property market mechanisms or public policy. In these mechanisms: a) the demand (e.g. young families without kids, higher occupation of dwellings occupied by their owners) and supply (e.g. increase of housing offer for higher-income groups, property tax) of the housing market (Finio, 2021), and b) public policy incentives for densification, re-urbanization, or recovery of socially depressed areas, stand out. Gentrification measurement, just like many aspects of applied research, is conditioned by the information available at different geographical aggregation levels (e.g. municipal, basic geostatistical area AGEB, or electoral section in the case study).
In this context, it becomes necessary to turn to complementary procedures and inevitable reductions. While some authors measure gentrification with several indicators (Bournazou, 2015), others limit this multidimensional phenomenon to just two variables, the average per bedroom income of the home, and the population with higher education (Revington, Zwick, Hartt & Schlosser, 2021), or overcrowding (homes with three or more people per room), and the population with university studies (Díaz Parra & Apaolaza, 2020). The lack of data to measure the social phenomenon leads to measurements being expanded upon with complementary information. This information not only rounds off the concept of gentrification, but also guides the study towards specific interest issues, such as youthification, studentification, the property market, touristification, or digitally augmented geographic dimension (Revington ***et al***., 2021; Sánchez Zárate, 2021; Less, Slater & Wyly, 2008). The revision of this bibliography shows that there is not just one way to address the complexity of the term and that there are very few empirical studies for Latin America with methodologies that are feasible to replicate.

The purpose of this research is to identify areas that are possibly gentrified or are undergoing gentrification in a case study, the metropolitan center of Monterrey (CMM), where the public sector has encouraged new vertical property developments. These actions, without correct urban planning, increase the value of an area and encourage the housing offer for young people or small families with a high purchasing power, fostering the expulsion of the current inhabitants (Moos, Filion, Quick & Walter-Joseph, 2019). An additional result of the study is the preparation of a methodology to address gentrification which can be repeated in other cities.

To achieve the goal set out, the work combines two components of gentrification: quality of life and the youthification of the population. There are several methodological options to address gentrification in the case study. One option is to merge the variables into a single gentrification index that can be mapped (Bournazou, 2015; Hammel & Wyly, 1996). Other alternatives consist in combining geo-referenced variables to typify the geographic space by overlapping thematic layers, statistically analyzing the information, or combining both procedures (Revington ***et al***., 2021).

This proposal suggests a methodology to classify gentrification in the study area by overlapping thematic layers, Google Earth images, fieldwork, and drone photography. The research data comes from the population and housing censuses of the National Institute of Statistics and Geography (INEGI, in Spanish) and the National Electoral Institute (INE, in Spanish). Said typology can be replicated in similar case studies that look to improve the city.

Specifically, the writing is laid out in seven sections focused on reaching the purpose set out: 1) Introduction; 2) Theoretical Framework; 3) Case Study; 4) Methodology; 5) Results; 6) Discussion; and 7) Conclusion.

II. THEORETICAL FRAMEWORK

Evolution, mutation, and adaptations of the concept of gentrification

The notion of "gentrification" can be understood as the attraction generated by property developers for residents that can pay higher rents, like the gentry, a phenomenon that encourages the expulsion of inhabitants with fewer resources (Gottdiener & Budd, 2005). The British sociologist, Ruth Glass, used the term in 1964 to describe an urban process with four traits: retrofitting of precarious areas; transition of rented housing to owned housing; increase in property prices; and displacement of low-income groups by middle-upper class people (gentry), from outside the area (Lees ***et al***., 2008). It is likely that Glass used the word sarcastically or ironically (Hamnett, 2003) or in a pejorative sense (Vestri, 2020), as downtown London showed, in her opinion, an embarrassment of riches.

Gentrification, in its origin, is a process that involves a change in the urban land use, where new higher-income users are accompanied by the restoration of the environment through private capital investment (Clark,

GENTRIFICACIÓN
EN EL CENTRO METROPOLITANO DE MONTERREY, 2010-2020
LUIS FERNANDO CAMPOS SÁNCHEZ, JESÚS A. TREVIÑO C
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 84 - 97
ISSN 0717 - 3997 / 0718 - 3607

2005). But it can also be seen as a structured result of land and housing use, where private capital has a return on higher investment (Smith, 1979).

Gentrification can be induced by government branches through a given ideology, or, fostered by private capital. As a result of the implementation of the neoliberal ideology, gentrification has its immediate example in some cases of the United States (for example, the famous case of Kelo v/s City of New London, taken before the Supreme Court of Justice). As an instrument of power of property capital and/or corruption of the public official, it has different versions, depending on the particular aspects of each property development.

Gentrification processes take place in cities around the world without this name being referred to. The term was adopted by the French as embourgeoisement or "social requalification", and as "embourgeoisement" "aristocratization" and "residential elitization" by the Spanish (Lees, 2011; García Herrera, 2001). The terms do not mean the same thing because they mutate and the manifestation of the process is distinct in the different cities of the world, including Mexico and the rest of Latin America. The original meaning of "gentrification" changed and evolved to refer to or be associated with not only the remodeling and "invasion" of central areas by the gentries, but also the construction of new buildings (re-urbanization); art and anesthetization of areas of the city (Lin, 2019); the settling of the "creative class" (Romero Renau & Lara Martin, 2015); the conversion of commercial areas targeting high-income groups (Sánchez Zárate, 2021; Rodríguez Barcón, 2020); touristification (reconfiguration of activities to serve tourists; Vestri, 2020); the super-gentrification (gentrification of already gentrified areas; e.g. Shi, Duan, Xu and Li, 2020; Lees ***et al***., 2008); the studentification (domain of the student population, Revington ***et al***., 2021; Prada, Cornejo & Quijada, 2020); and youthification (Moos, Revington, Wilkin & Andrey, 2018). All these manifestations or definitions of gentrification imply a cultural and socioeconomic transformation of areas linked to urbanism induced or dominated by private capital.

All gentrifying actions have, regardless of the name, a common denominator: the profit of private capital disguised as modernity and the common good. These actions do not just displace the population from the area, but rather "they sell" property developments as creative efforts, of rebirth or urban triggers of the first polygon of the city. Following this narrative, society as a whole is "indebted" to these benefactors, whether investors or public administrators. Whoever dissents or resists these actions is automatically labeled as backward and irresponsible on being against social wellbeing.

The presence of gentrification in different cities manifests the importance of studying the phenomenon addressed in this article. The emergence and evolution of gentrification are uncertain because there are multiple and varied contexts (social hybridity and/or neighborhood resistance) and, on some occasions, the expulsion of its current inhabitants does not happen.

It is worth stating that this exploration does not discuss gentrification as an ideology of the speculation and profit process of the property capital cycle. The case study classifies the areas of CMM as a result of a dual process, youthification and the increase in quality of life. In recent analyses, youthification results, in fact, from a component associated with gentrification (Revington ***et al***., 2021; Moos ***et al***., 2018). On the other hand, the evolution of quality of life is a multivariate component that summarizes social mobility and change in habitability, as Bournazou (2015) and Díaz Parra and Apaolaza (2020) suggest.

Looking in-depth at the mechanisms that started this gentrification process and the political and social marketing strategies involved, are outside the purpose of this research. This limitation does not imply that the classification of gentrified areas or those undergoing this is a naïve technical exercise that ignores gentrification from lucrative processes, materialized in projects that symbolize modernity and social progress.

III. CASE STUDY

The case study comprises the polygon that the Metropolitan Center of Monterrey (CMM) forms (Figure 1). Nowadays this area shows a clear decadence in the residential constructions. The population and housing census of 2010 revealed the presence of 5304 abandoned dwellings, from a total of 17,078 located in the sector. The abandonment of dwellings fosters the creation of focal points of insecurity, deterioration of existing urban space and infrastructure, and makes it less attractive to buy and/or live in the sector (Figure 2).

To encourage property development in the CMM, government officials have made changes to the current Urban Development Plan 2013-2025 (Municipal Government 2012-2015). The main attraction is the sites located in Transport Focused Development

GENTRIFICACIÓN
EN EL CENTRO METROPOLITANO DE MONTERREY, 2010-2020
LUIS FERNANDO CAMPOS SÁNCHEZ, JESÚS A. TREVIÑO C
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 84 - 97
ISSN 0717 - 3997 / 0718 - 3607

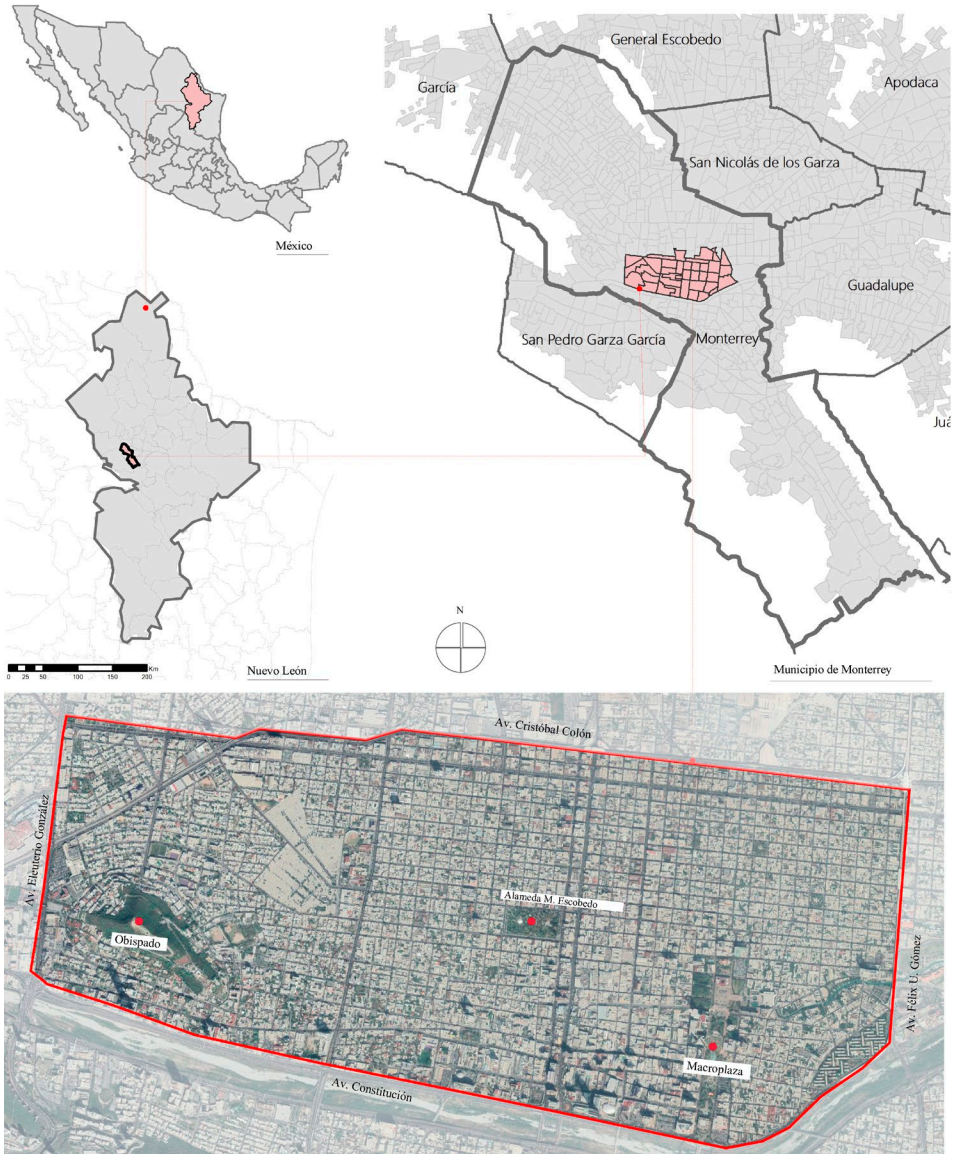


Figure 1. Metropolitan Center of Monterrey (CMM). Source: Preparation by the Authors using ArcGis 10.5 and Google Earth Pro.

Figure 2. Abandonment of dwellings in CMM. Source: Preparation by the authors with Google Earth Pro.

GENTRIFICACIÓN
EN EL CENTRO METROPOLITANO DE MONTERREY, 2010-2020
LUIS FERNANDO CAMPOS SÁNCHEZ, JESÚS A. TREVIÑO C
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 84 - 97
ISSN 0717 - 3997 / 0718 - 3607

Figure 3. Metropolitan Center of Monterrey (CMM). Source: Preparation by the Authors with ArcGis 10.5 and Google Earth Pro.

Areas (D.O.T. in Spanish), mainly due to the following two premises:

1. Increase in habitation density to 150 dwellings per hectare in lots over 1000m^2 in surface area, found along the high impact corridors (Av. Colón to the North, Av. Félix U. Gómez to the East, Av. Constitución to the South, and Av. Gonzalitos and Av. Revolución to the West).

2. Reduction of number of parking spaces, by 50% in regards to building permits, for sites located within a fringe of 500 meters on both sides of the Metro Line and the Eco-route.

Currently, there are some examples of the new property developments in the sector, created under this government densification plan in the CMM, such as: Kyo-Constella, with a total of 169 apartments, close to Alameda de Monterrey, and the Históricah development, with 150 apartments, on Avenida Hidalgo, while "el Semillero", with 240 apartments, and the Obispado Towers (T.O.P. in Spanish) are on Avenida Constitución, cataloged as the highest tower in Latin America, at 304.8 meters tall (Figure 3).

IV. METHODOLOGY

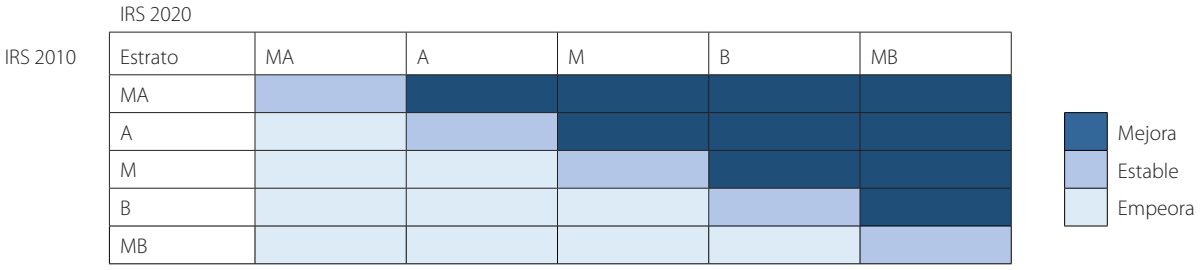
This work uses a quantitative methodology with the support of the ArcGIS 10.5 program. The study recalculates the Social Backwardness Index (IRS) by the main components, with information from the National Council for the Evaluation of Social Development Policy (CONEVAL). The procedure uses stacked data so that the data are compatible with the 2010-2020 period. The indicators are: a) Education; b) Access to health services; c) Quality and space in the dwelling; d) Basic housing services; and e) Assets of the home. This allows making a comparison in the evolution regarding improvements, backwardness, or decline in the socioeconomic level of each Basic Geostatistical Area (AGEB) in the study area. This longitudinal comparison can be seen as an analysis of the evolution of the quality of life at the level of individuals settled in the area (Bonatti, Ivaldi & Soliani, 2017). These two components register social and demographic variables for consumption (Finio, 2021), used to represent the basic concept of gentrification in recent empirical studies (Bournazou, 2015; Díaz Parra & Apaolaza, 2020).

After this, a youthification index is generated at an electoral section level in the 2010-2020 period (INE): The Potential Dependence Index (ISP) is estimated, where the numerator is young adults (popularly called Millennials) and the denominator, older adults, which has the purpose of measuring the ratio of the group of 24 to 35-year-olds per 100 people of 60 and over (Ofori, Zoomer, Curtis, Zoungas & Gambhir, 2017). That is to say, the higher the ISP value is, the higher the concentration of young people in the electoral section compared to the older adults. (This research began before the publication of the results of the 2020 census, and this option is kept because of its usefulness for intermediate intercensal studies).

Both social backwardness (IRS2010-IRS2020) and youthification (ISP2010-ISP2020) are analytically connected in successive census years to create a typology of the gradual progress of gentrification in the area (Figure 4). The research suggests a classification of areas by combining these two components to represent different degrees of gentrification without implying a cause-effect relationship. Finally, the study collected qualitative and quantitative complementary information on the urban environment of the polygons, especially about the vertical housing offer, the existence of a student population, and the

GENTRIFICACIÓN EN EL CENTRO METROPOLITANO DE MONTERREY, 2010-2020
LUIS FERNANDO CAMPOS SÁNCHEZ, JESÚS A. TREVIÑO C
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 84 - 97
ISSN 0717 - 3997 / 0718 - 3607

a) Evolución de la calidad de vida (IRS), 2010-2020



b) Evolución de la proporción de jóvenes respecto a los adultos mayores (ISP), 2010-2020

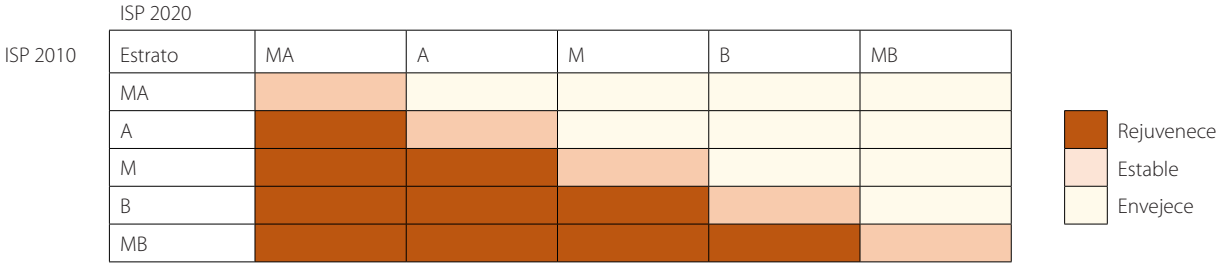


Figure 4. Classification of areas by the evolution of the social backwardness (IRS) and the age groups (ISP), 2010-2020. Source: Preparation by the Authors. Stratums obtained by Jenks natural breaks with ArcGis 10.5. Note the inverse classification of the quality of life by the negative connotation of the social backwardness. MA = Very High; A= High; M = Medium; B = Low and MB = Very Low.

GENTRIFICACIÓN
EN EL CENTRO METROPOLITANO DE MONTERREY, 2010-2020
LUIS FERNANDO CAMPOS SÁNCHEZ, JESÚS A. TREVIÑO C
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PÁG. 84 - 97
ISSN 0717 - 3997 / 0718 - 3607

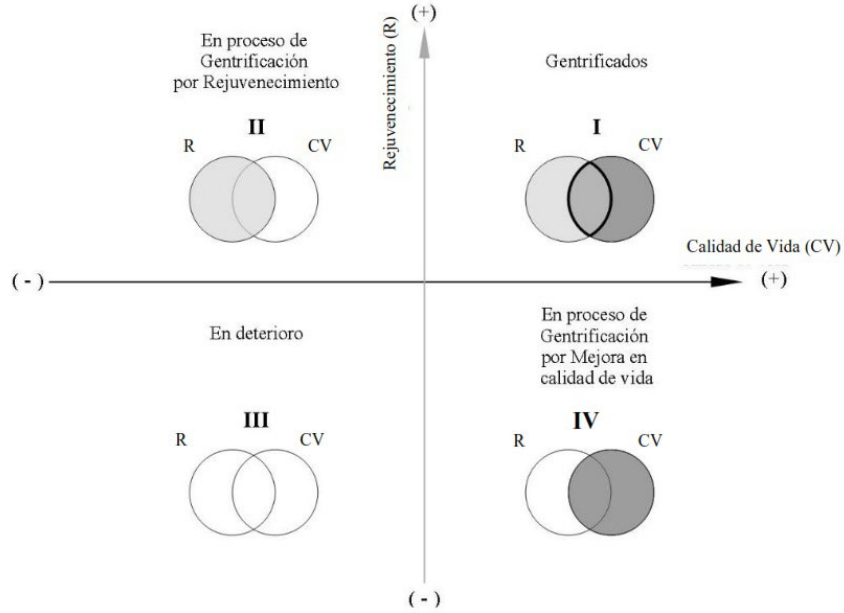

Figure 5. Non-Spatial Classification of Gentrification (Social Backwardness and Youthification). Source: Preparation by the Authors. The colorless section (in white) in the circles indicates a reduction in the variable(s) that they represent.

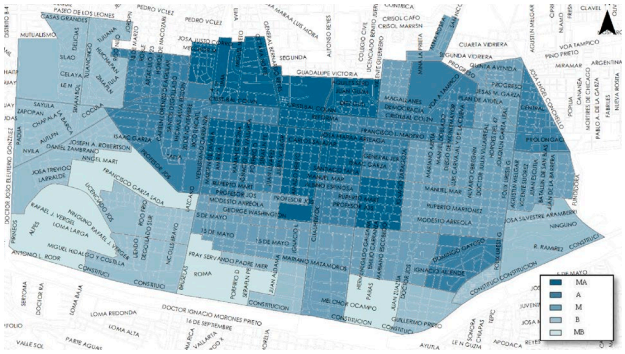

Figura 6. IRS 2010.
Source: Preparation By the authors using ArcGis 10.5

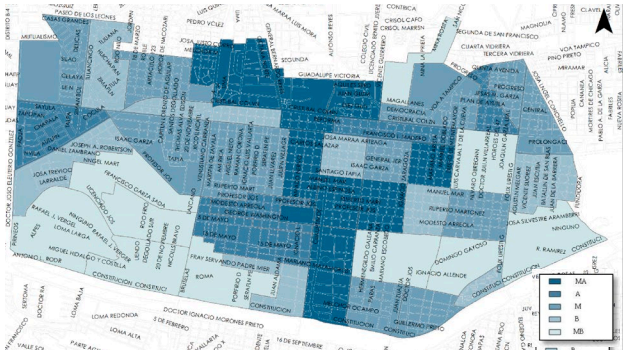

Figura 7. IRS 2020.
Source: Preparation By the authors using ArcGis 10.5

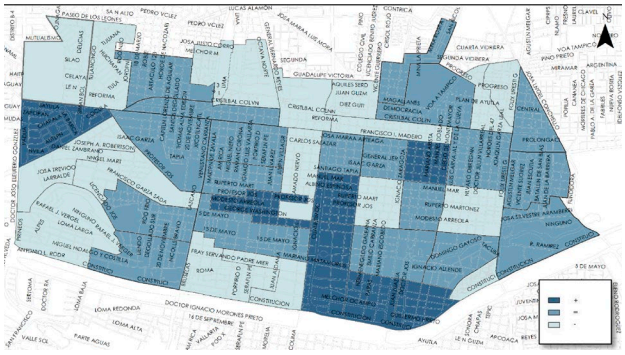

Figura 8. IRS 2020 contra IRS 2010.
Source: Preparation By the authors using ArcGis 10.5

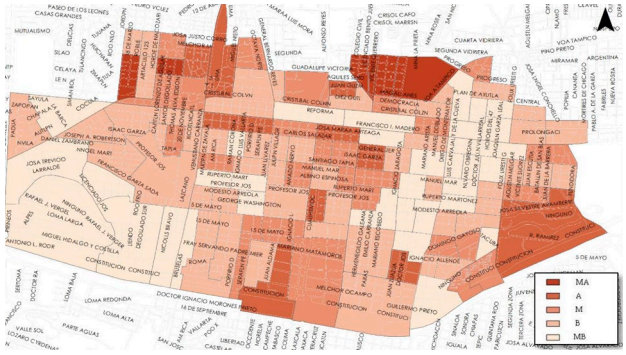

Figura 9. ISP 2010.
Source: Preparation By the authors using ArcGis 10.5

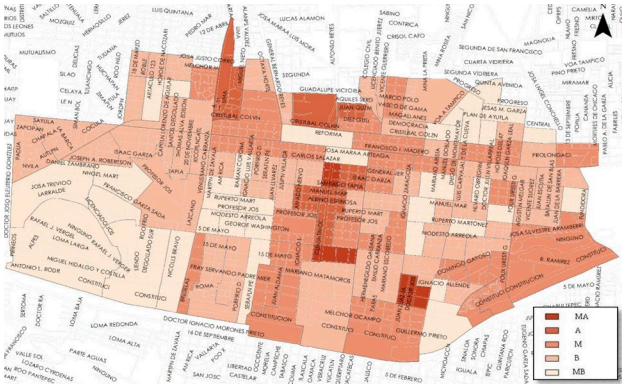

Figura 10. ISP 2020.
Source: Preparation By the authors using ArcGis 10.5

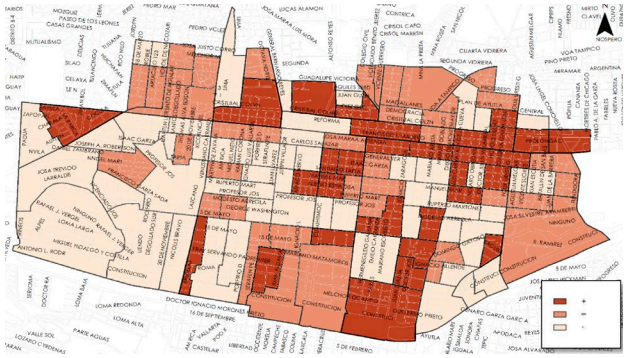

Figura 11. ISP 2020 contra ISP 2010.
Source: Preparation By the authors using ArcGis 10.5

location of the new property developments. This information comes from the Google Earth Pro tool, from trips by car, and a drone photographic survey.

As can be seen, the combination of social backwardness and youthification defines gentrification in this research. The reduction of social backwardness implies an improvement in the quality of life. On crossing these two components, a classification of areas emerges in four types or variations of the gentrification process (Figure 5). Each type is illustrated with photographs taken by a drone, controlled from a motorized vehicle in each area.

GENTRIFICACIÓN
EN EL CENTRO METROPOLITANO DE MONTERREY, 2010-2020
LUIS FERNANDO CAMPOS SÁNCHEZ, JESÚS A. TREVIÑO C
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 84 - 97
ISSN 0717 - 3997 / 0718 - 3607

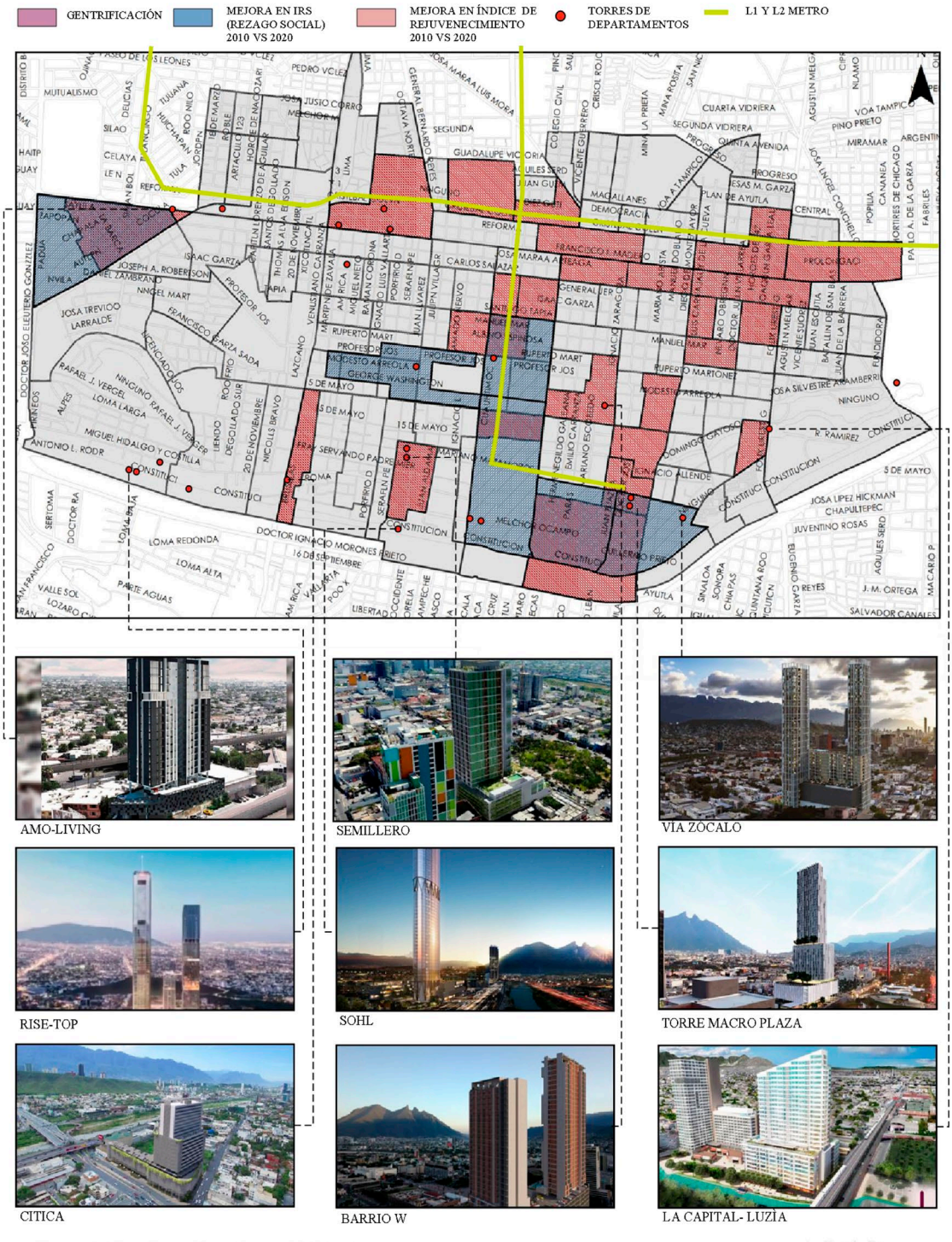

Figura 12. Gentrification in the CMM with apartment building developments.Source: Preparation by the authors with ArcGis 10.5 and Google Earth Pro.

GENTRIFICACIÓN
EN EL CENTRO METROPOLITANO DE MONTERREY, 2010-2020
LUIS FERNANDO CAMPOS SÁNCHEZ, JESÚS A. TREVIÑO C
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 84 - 97
ISSN 0717 - 3997 / 0718 - 3607

Figure 13. Medicine Campus Area. (Av. Calzada Madero – Av. Insurgentes). Source: Photographs by the authors using a drone flight and from a vehicle.

V. RESULTS

The overall result of this section is the typology that generates the crossing of areas that rejuvenate with those that report improvements in the quality of life. This crossing is possible when, first of all, there is a typology of the social backwardness index over time and, then, of another typology of young people/older people proportion in the areas of the CMM. The crossing of both tools provides a classification of areas in the case study. The longitudinal comparison of social backwardness in the 2010-2020 period identifies areas where the quality of life improves, worsens, or remains stable. The details of the case study are presented below.

The IRS in the CMM includes 44 AGEBS. The stratification method is governed by natural breaks, to be classified into 5 divisions: Very High (MA), High (A), Medium (M), Low (B), and Very Low (MB). 2010 reports the following stratification for the IRS: MA (9), A (11), M (10), B (10) and MB (4) (Figure 6). In 2020, it has MA (9), A (5), M (13), B (7), and MB (10) (Figure 7). The following area classification is shown for 2010 and 2020: Improves: Drop in stratum +); Stable: remains in the same stratum (=); and Worsens: Goes up in stratum (-). In the analysis area, 8 AGEBS improve (+), 17 are stable (=), and 19 worsen (-) (Figure 8).

The time comparison of the age groups of people settled in the CMM determines whether their areas age, rejuvenate, or remain stable. In the case study, the CMM contains 123 electoral sections. The study calculates the ISP for the 2 aforementioned years, 2010 and 2020). The partition of the ISP by natural breaks generates the following stratums: Very high (MA), High (A), Medium (M), Low (B), and Very Low (MB). The crossing of this stratification likewise allows a numerical comparison of stratums with the Social Backwardness Index (described in the previous paragraph). 2010 reports the following stratification of 123 electoral sections: MA (6), A (10), M (27), B (50), and MB (32) (Figure 9). While 2020 registers: MA (3), A (7), M (23), B (57), and MB (33) (Figure 10). The comparison of the stratums in the period has 39 aged (-), 56 stable (=), and 29 rejuvenated (+) districts (Figure 11). Finally, the crossing of the areas that rejuvenate with the improvements in the quality of life, generates gentrification in the areas of the CMM (Figure 12).

Quadrant I: Gentrified

Increase of quality of life (reduction of social backwardness) and increase of Youthification Index (ISP). Characterized by an improvement of social backwardness index indicators and a considerable increase of young adults over older adults. Quadrant I can be seen with the images taken by the drone flights (Figure 13). Two examples are the following:

a) The intersection of Av. Calzada Madero and Av. Insurgentes. Nowadays, the development of mixed-use AMO-living is in the construction stage. This emerges within an area alongside the Medical Campus of the Autonomous University of Nuevo León.

b) Barrio Antiguo Area. Here the Torre Macroplaza and Via Zócalo complexes are found, whose construction took place despite resistance from the neighbors. These complexes have already altered the spatiality of the area, even though they are currently being built (Figure 14 and 15).

GENTRIFICACIÓN
EN EL CENTRO METROPOLITANO DE MONTERREY, 2010-2020
LUIS FERNANDO CAMPOS SÁNCHEZ, JESÚS A. TREVIÑO C
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 84 - 97
ISSN 0717 - 3997 / 0718 - 3607


Figure 14. Vía Zócalo Tower. Barrio Antiguo Area. Source: Render taken from http://topsidefront.com/index.php/portfolio/via-zocalo/.
Figure 15 Barrio Antiguo Area. Source: Photographs by the authors using a drone flight and from a vehicle.


Figura 16. Purísima Area. (Calle Hidalgo – Calle S. Peña). Source: Photographs by the authors using a drone flight and from a vehicle.

GENTRIFICACIÓN
EN EL CENTRO METROPOLITANO DE MONTERREY, 2010-2020
LUIS FERNANDO CAMPOS SÁNCHEZ, JESÚS A. TREVIÑO C
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 84 - 97
ISSN 0717 - 3997 / 0718 - 3607

Quadrant II: Undergoing gentrification through youthification.

Does not increase the quality of life (Social Backwardness) and increases the Youthification Index (ISP). There is an increase of young people compared to the current inhabitants, in an area that has not improved its social backwardness indicators. This process strengthens the socioeconomic segregation of the current inhabitants and creates a gap in the land rent (Smith, 1979). The areas where photographic surveys were made are located on Calle Miguel Hidalgo y Costilla, at the intersection with Serafín Peña, on the esplanade of the Iglesia de la Purísima Church. Today there are high-rise apartment buildings, like Semillero Purísima Tower 1 and 2 (Figure 16).

Quadrant III. Declining.

Does not increase the quality of life (or reduce social backwardness) and does not increase the Youthification Index (ISP). The natural tendency is to move towards Quadrant II (reduction in quality of life with youthification, unless unforeseen actions occur that displace the area to quadrants I or IV). The Obispado TOP Tower is in this area, on Av. Hidalgo, which seems to house its first inhabitants. In the polygon, the RISE Tower is being built on Av. Constitución, a highly gentrifiable area (Figure 17).

Quadrant IV: Undergoing gentrification because of improvement in quality of life.

Increases the quality of life (reduces social backwardness) and does not increase the Youthification Index (ISP). In these areas, the social backwardness index indicators improve between 2010 and 2020, and the number of young people over older adults has not changed spatially. The natural tendency is to move towards Quadrant I (increase in quality of life accompanied by a youthification of the area). The photographic survey was

Figure 17. Obispado Area: Rise-Top Tower. Source: Render and design by Pozas Arquitectos (http://www.pozas.mx/)
Figure 18. Historicah. Alameda Area. Source: Photographs by the authors using a drone flight and from a vehicle.

made in this area (Av. Washington and Av. Pino Suárez), which may be affected by buildings like Históricah and Icónicah and the surrounding universities like the Regiomontana University (U-ERRE) (Figure 18).

VI. DISCUSSION

Gentrification, just as has been described in the preceding paragraphs, refers to demographic changes expressed in the supply and demand of housing in the market. In the United States of America, demographic changes brought a rise of 11 million people in the 25-30 age group between 1965 and 1976. Currently, this age group has been affected by the change in lifestyles, characterized by more work opportunities for women, and a supply of smaller-sized housing (Ley, 1986). Apartment buildings, in this case study, offer this type of housing for middle and high-income young people.

The increasing rise of young people in urban centers is known as youthification (Moos, 2016). There is little analysis of the socio-spatial impact of this group. The youthification process occurs as young adults increase their participation in the total population in neighborhoods surrounding work hubs (Moos, 2016). The goal of the property market is to attract young buyers with high purchasing power through loft-type apartment complexes, creating an offer focused on satisfying the demand for small dwellings (Skaburski, 2006). This is the housing offer in the CMM, and this age group will dominate in the area if demand exists or is generated.

Youthification is spatial segregation between two main age groups: young adults and older adults. In the former (between 25 and 34 years old), interests tend to be focused on education, leisure activities, building a family, or, on the other hand, delaying or abstaining from marriage. The great majority of those in this group are trying to enter the housing and job markets for the first time (Lee, 2018). On the other hand, the second group (60 and above), is focused on social security policies, attention and services for older people, leisure activities related to aging (Winkler & Klass, 2012). This social phenomenon is characterized by being present in central high-density areas of the Metropolitan Centers.

Another factor that contributes to the rise in young people in the urban space, is related, broadly speaking to the presence of universities or educational centers. Nearby residential areas attract an important number of young adults that affect the setup and evolution of the urban environments (Moos. 2016). This phenomenon is called studentification because it refers to the presence of students in a neighborhood or urban environment around campuses. Said presence brings changes in the physical and economic environment around its location (Smith, 2005). This is seen in the surroundings of the medical campus of UANL, formed by the Faculty of Nutrition, Medicine, Psychology, and Veterinary Science, and around U-ERRE, described in the areas of Quadrant IV.

The presence of young adults in urban centers is a reality. Today it can be seen in the offer of property developers in the Metropolitan Center of Monterrey. It is worth remembering that some emerging housing complexes are not within the D.O.T. quadrant, which causes repercussions on the traffic where they are located.

In this research, gentrification is characterized by the increase in the quality of life of an area and the increase of young adults (25-34) over the older adults (60+). This happens amid the emerging land occupation by multifunctional and housing towers of different varieties. The improvement in the quality of life and youthification do not always converge in the space. But when these two components converge, gentrification occurs.

GENTRIFICACIÓN
EN EL CENTRO METROPOLITANO DE MONTERREY, 2010-2020
LUIS FERNANDO CAMPOS SÁNCHEZ, JESÚS A. TREVIÑO C
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 84 - 97
ISSN 0717 - 3997 / 0718 - 3607

VII. CONCLUSIONS

This article classifies land, simultaneously considering social backwardness and youthification. This classification is accompanied by the geolocalization of high-rise property developments that take place in the heart of Monterrey. The study suggests that this combination of variables (reduction of social backwardness, youthification, and vertical growth) facilitates the gentrification of CMM. This process should take place under public social cohesion policies between the current inhabitants and new residents, under a location layout on the main transportation lines of the area. The results identify "gentrified" areas in places away from the collective transportation systems. This means to say that, without proper planning, mobility in motorized vehicles will continue to be a priority in the area. Likewise, the arrival of new inhabitants in the area ("millennials") must be linked to offering services and facilities for their specific age group.

The results of this research provide a localized approach to the areas that have gentrification traits in the Metropolitan Center of Monterrey. Despite not detecting the specific expulsion of the CMM's inhabitants, areas that foster gentrification more are detected, which are undergoing gentrification due to youthification (Quadrant II), or on reducing social backwardness (Quadrant IV). On the other hand, some areas see a decline in youthification and the quality of life (Quadrant III). However, the presence of high-rise towers in an advanced stage of construction (Obispado and Rise Towers) indicates a trend in the displacement towards Quadrant II (undergoing gentrification due to youthification) or Quadrant I (Gentrified).

In general, the typologies or classifications describe and are pretty useful for a specific end, but they do not explain a phenomenon or statistically prove any hypothesis. The typology of this study identifies different degrees of the gentrification process through the combination of two components suggested by the bibliography revised in the theoretical framework. The statistical significance of the quality of life and youthification over time and space is a subject for future studies. These studies imply running tests of hypotheses through descriptive statistics (T-tests for related or paired samples, for example) on the change in the quality of life and youthification, and to identify agglomerations through spatial auto-correlation techniques (e.g. Moran's local index). This statistical work can be done thanks to the information generated in this study, but it is part of another paper to avoid profusion and confusion of the results.

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THE URBAN STRUGGLE TO REGAIN AND REDEFINE THE PUBLIC SPACE IN LATIN AMERICA

LA LUCHA URBANA POR LA RECONQUISTA Y LA REDEFINICIÓN DEL ESPACIO PÚBLICO EN AMÉRICA LATINA

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LA LUCHA URBANA POR LA RECONQUISTA Y LA REDEFINICIÓN DEL ESPACIO PÚBLICO EN AMÉRICA LATINA
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Desde su concepción en la antigua Grecia, el espacio público cumple un rol fundamental en la política y la democracia de las ciudades; rol degradado en la posmodernidad y que alcanza su más profunda crisis en plena madurez del sistema posfordista (a partir de 1990). Esta depresión económica y de representación y legitimidad institucional que viven los Estados ha potenciado el surgimiento y resurgimiento de distintos movimientos sociales que inundan las ciudades a nivel global. Así, nace la inquietud del colectivo Frente Urbano Amparo Poch y Gascón, conformado por las presentes autoras, de reconocer y caracterizar desde una lógica socio-urbana estas manifestaciones y los espacios públicos sobre los que han ejercido una ocupación sostenida en distintas ciudades de América Latina durante la última década. La presente investigación, enmarcada en el Encuentro Virtual Latinoamericano Utopías Líquidas, se propone, a partir de una metodología de mapeo colectivo, reconocer los espacios públicos y caracterizar la ocupación ejercida por los movimientos sociales latinoamericanos sobre éstos, en la disputa por resignificarlos y reconquistar el carácter político de los mismos y, de esa forma, poner en valor a los distintos movimientos sociales latinoamericanos y sus luchas, en un acto que dé aliento a la resistencia y a la solidaridad.

Palabras clave: Cartografía, ciudades, espacio público, movimiento social, reconquista.

Since its inception in ancient Greece, public space has played a key role in the politics and democracy of cities. Its role has been degraded in post-modernity, and reached its deepest crisis in the full maturity of the post-Fordist system (from 1990 onwards). This economic and representation depression, as well as institutional legitimacy, that States are experiencing, have promoted the emergence and resurgence of different social movements that flood cities globally. Here is where the concern of the Frente Urbano Amparo Poch y Gascón collective lies, formed by the authors, to recognize and characterize, from a socio-urban logic, these manifestations and the sustained occupation that public spaces have experienced in different Latin American cities during the last decade. This research, framed within the Virtual Latin American Meeting, Utopías Líquidas, is proposed starting from a mixed methodology of collective mapping, recognizing public spaces, and characterizing their occupation exercised by Latin American social movements, in the dispute to redefine them and regain their political character, and thus value the different Latin American social movements and their struggles, in an act that encourages resistance and solidarity.

Keywords: Cartography, cities, public space, social movements, reconquest.

I. INTRODUCTION

Standing up against a historical period marked by the obstacles institutionality imposes, to avoid the use of the public space for political purposes (Borja, 2012), multiple social movements broke out in different cities around the world, taking to the streets, squares, and parks, around a great social demand for the urban space (Inzulza-Contardo, J., 2020). Latin America has not been left outside: organizations like the National Campaign for the Right to Legal, Safe and Free Abortion in Argentina, protests for Free and Quality Education in Chile, the Movement for the 43 Students of Ayotzinapa in Mexico, among many others, flooded out into our cities.

The reflection on the mobilizations in Latin America and their great presence in the public spaces that post-modernity tried to snatch away (Lefebvre,2013), has to be analyzed and discussed from the point of view of architecture and urbanism. This investigation intends, in this way, to contribute to the analysis that has been addressed by editorials of the latest issues of architecture journals in the country, like those published by Fuentes Hernández and Cerda Brintrup (2020) in Arquitecturas del Sur, Inzulza Contardo (2020) in Revista de Urbanismo, Zazo Moratalla in Revista Urbano (2019), and the unpublished book ***Hilos Tensados*** by Kathya Araujo (2019). This study begins to fill the vacuum that the state-of-the-art reveals in this area: the necessary investigation and practical recording of the process of regaining and redefining the public space in our continent, by its protagonists. This work falls within an effervescent political moment of great importance, both for our region and for Latin America, and it tries to contribute towards making visible and valuing the role that social movements and their claims play in the public space of cities, to contribute towards a reading of a common reality from the dialog among nations.

The general purpose of the research is to recognize public spaces and characterize the occupation exercised by Latin American social movements over these during the last decade, in a process to regain their political nature.

The specific goals are defined in chronological order. The first corresponds to recording the social movements that have been part of the phenomenon to recover public space in San Juan, Argentina; Concepción, Chile; San José, Costa Rica; Cusco and Tacna, Peru; Montevideo, Uruguay; and Caracas, Venezuela. Second, the routes protests followed are outlined, from the public space they began in, through the crowds, the streets these were mobilized on, and where they ended. After this, the public spaces of gathering and social protests are determined, recording their nature, the adjoining buildings, and the symbolic evidence of their reconquering. And finally, the areas within the public space associated with standoffs with law enforcement, their adjoining buildings, and their context are identified.

To suitably meet these goals, the work uses a collective online mapping methodology.

II. THEORETICAL FRAMEWORK

The public space from a historic perspective

The notion of "public space" is of particular interest in the different branches of social science, as essentially it symbolizes, unlike the private, the territory that belongs to all society and is common for the people. Its more in-depth definition acquires new connotations on exploring its conceptual historicity in the different disciplinary approaches of knowledge and their multiple schools of thought.

In the framework of a historical-urban narrative, there is consensus in finding in the agora of classical Greece, the first conception of public space (Berroeta & Vidal, 2012) which, although it brings together multiple and varied social, commercial, and cultural uses, its most relevant role, as a platform of politics, was closely tied to freedom and against domination (Arendt, 2018). It is precisely this idea that has been degraded in western postmodernity, where the public space is relegated to leisure and trade, but essentially to a place to pass through (Sennett, 1977), where elements that favor being there are suppressed, and the population is watched to avoid any political expression understood as civil disobedience (Borja, 2012). In the words of Erik Swynegedouw, said depoliticization provokes constant urban insurgency that clamors for a political field of democratic disagreement (Valenzuela, 2020).

The crisis of the system and the city

Right from the highest point of Post-Fordism (starting in 1990), a system violently and repressively put in place in several Latin American countries (Klein, 2007), and when the financial market has already privatized the national companies and public services that guaranteed access for the population to their social rights, today it becomes ever more marked, on even privatizing reproduction of life itself (Fumagalli, 2010). Social malaise, the fruit of a long international economic depression present since 2007 (Roberts, 2019), and the crisis of representation and legitimacy that Latin American institutionality is undergoing (Mayol, 2012), reached critical levels,

LA LUCHA URBANA POR LA RECONQUISTA Y LA REDEFINICIÓN DEL ESPACIO PÚBLICO EN AMÉRICA LATINA
FLORENCIA RETAMAL QUIJADA, JAVIERA PAVEZ ESTRADA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PAG. 98 - 111
ISSN 0717 - 3997 / 0718 - 3607

triggering a wave of global movements that boomed as of 2011, from when there has not been a season without mass-scale protests taking to the public spaces of Latin American cities (Players, 2018).

For the sociologist Marcos Roitman (2012), the causes raised vary greatly in content, but there is an important element in common: the attempt to regain restricted public spaces to deepen their political and democratic nature, as the crisis of the current economic model is closely linked to the crisis of the public nature of the city (Harvey, 2008). In this sense, Roitman (2012) suggests that the immediate result of these protests is the need to recover the public space.

Reconquering and renaming

The social uprising that began in October 2019 in Chile, constitutes for the architect and urbanist Tai Lin, an emblematic example of the protests that have been brewing for decades, of urban violence that fights for the public space and that regain, among others, the former Plaza Italia – or Plaza Baquedano., renaming it Plaza de la Dignidad (Dignity Square) (Lin, 2019). About the renaming processes, and thus, the redefinitions of the public space, it is essential to highlight the importance of meanings and symbolisms nowadays. For the urban sociologist, Manuel Castells (2006), in information societies, both the manipulation of communication and its preparation in terms of knowledge tend to superimpose the material dimension of existence.

Refining the limits of the public is, according to the studies of Tejerina (2005), an urgent priority for social movements. The connotation of this sphere, for Rizzo (2011), is not universal but is unpredictable and disputed. It is the very attempts of appropriation of the mobilized groups, who load the public space with meanings. The phenomenon described by Roitman (2012) of taking over squares and other places with a strong political and social content to try to recover them is, agreeing with Fernández (2013), a phenomenon before opposing the same regime and the structures of power. According to his analysis, this is a battle for the use that they have given to the space, through practices of resistances and domination, before the system itself. Meanwhile, Swynegedouw (2018) proposes that social movements, in their attempt to recover the public space from postmodernism as a meeting and political place, redefine the city beyond a productive-economic device, enriching the ***polis*** with political and democratic status. Ultimately, "squares and streets are renamed, questioned symbols are brought down, the iconic architecture of the established model is attacked. The stormed city is not silent, it screams out clamoring for urgent transformations" (Fuentes Hernández & Cerda Brintrup, 2020, p. 4).

III. METHODOLOGY

The decision was made to face the goals of this research using a methodology based on collective mapping, capable of gathering knowledge within the current South American context, narrated by the ***civitas***, conceived as subjective and diverse, beyond the strictly physical, a dimension that, in line with what has been outlined by Jirón and Fada (2000), is of great importance within the framework of urban studies.

Collective knowledge building methodologies, where the "sum or combination of academic knowledge with the popular can end up being an element of a new scientific paradigm" (Fals Borda, 2015, p. 5) emerges through a narrative strategy that contributes towards information gathering (Iconclasistas, 2013, p. 58), being of both a qualitative and quantitative methodological nature.

The main methodological tool used in this study, to produce intuitive maps, is collective mapping, understood as a:

> creation process that subverts the place of enunciation to challenge the dominant narrations about territories, starting from the day-to-day knowledge and experience of participants. Making the most pressing issues of the territory visible on graphical and visual support (Iconoclasistas, 2013, p. 12).

Among the most recently published research that has addressed the aforementioned tool, are those dynamized in a pandemic context by Iconoclasistas (2021), "Problemáticas y resistencias, Mujeres del Chaco Americano" (Problems and Resistance, Women of the American Chaco), by René Squella Soto (2021), "Conflicto socioambiental, participación ciudadana y disputa territorial: La mirada de la Psicología Ambiental Comunitaria" (Socioenvironmental conflict, citizen participation, and territorial dispute: the view of Community Environmental Psychology", and the article of Liliana Lapomarda (2020), "Diagnóstico del espacio vivido para contribuir a aprendizajes situados" (Diagnostic of the lived space to contribute towards situated learnings). These publications in different territories (El Chaco Americano: Argentina, Bolivia, Paraguay; La Ligua, Chile; La Plata, Argentina, respectively) successfully record, by collective mapping, substantial elements to confirm their respective hypothesis from first-person experiences of their protagonists.

This recording was made during the workshop "The City as a Platform for Social Movements", proposed by the collective Frente Urbano Amparo Poch and Gascón (Retamal & Pavez, 2020), in the Latin American Virtual Meeting – Utopías Líquidas (Liquid Utopias), by groups of countrymen and women that developed the online mapping of their respective city. This was done while they shared with all the participants on

LA LUCHA URBANA POR LA RECONQUISTA Y LA REDEFINICIÓN DEL ESPACIO PÚBLICO EN AMÉRICA LATINA
FLORENCIA RETAMAL QUIJADA, JAVIERA PAVEZ ESTRADA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 98 - 111
ISSN 0717 - 3997 / 0718 - 3607

the same virtual platform, which allowed constant feedback and dialog among them and those running the workshop. This form of focalized and group work made it possible to reveal similar and/or different knowledge and experience that people living in the same territory narrated, provoking dialog, and giving as a result, a map that is capable of representing a more democratic truth.

The case studies are Latin American cities inhabited by two or more participants of the aforementioned workshop. This is not a selection based on a supposedly political or urban standard, but rather a methodological decision focused on recording territories of the people who randomly signed up for the activity. The cities studied are: San Juan, Argentina; Concepción, Chile; San Jose, Costa Rica; Cusco and Tacna, Peru; Montevideo, Uruguay; and Caracas, Venezuela.

By linking the maps of different cities, it was possible to generate a broader and continental vision of the phenomenon of reconquest and redefinition of the public spaces occupied over the last decade by social movements, where the reflection from participative construction is key.

To guide the flow of action and representation of urban realities, it was defined to collect the following elements: collective organizations, buildings of sociopolitical importance, crowds, routes, and conflicts with law enforcement; considered relevant when it came to analyzing the platforms of expression of social movements, and as indicators of the struggle to reconquer to enrich the political and democratic content of the public spaces.

The knowledge collected through the mapping and narratives is materialized in a homogenized map, transcribed information, and a final summary table. The data systematization, its analysis, comparison, and finally the crossing of these aspects with the bibliographical discussion, allows reaching the goals of this research, which will corroborate its main hypothesis on registering the dispute for the sustained use of public spaces as a political platform between two crucial players: on one side, the group of protestors and, on the other, institutionality, represented in practice by law enforcement, as "the reconquest by protestors of a space appropriated by the regime, makes the place a public element in dispute, whose occupation in itself is considered a success, given the ideogrammatic load this entails" (Navarro de Pablos, Navas Carrillo & Pérez Cano, 2021, p. 188).

V. RESULTS

San Juan

During the "City as a Platform for Social Movements" workshop, the group of participants highlights, among the social movements there have been in the city of San Juan, feminist protests, like "Ni Uno Menos" (Not one [woman] less) and the "National Campaign for the Right to a Safe, Legal, and Free Abortion".

Figure 1. Map with the location of the Latin American cities studied. Source: Preparation by the Authors.

Pictograms	
Protests	
	Routes
	Gatherings
	Conflict with law enforcement
Collective Organizations	
	Political Organization
	Social Organization
	Cultural Organization
Buildings of sociopolitical importance	
	Government building
	Ecclesiastical building
	Educational building
	Institutional building

Figure 2. Table of pictograms. Source: Preparation by the Authors.

LA LUCHA URBANA POR LA RECONQUISTA Y LA REDEFINICIÓN DEL ESPACIO PÚBLICO EN AMÉRICA LATINA
FLORENCIA RETAMAL QUIJADA, JAVIERA PAVEZ ESTRADA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PAG. 98 - 111
ISSN 0717 - 3997 / 0718 - 3607

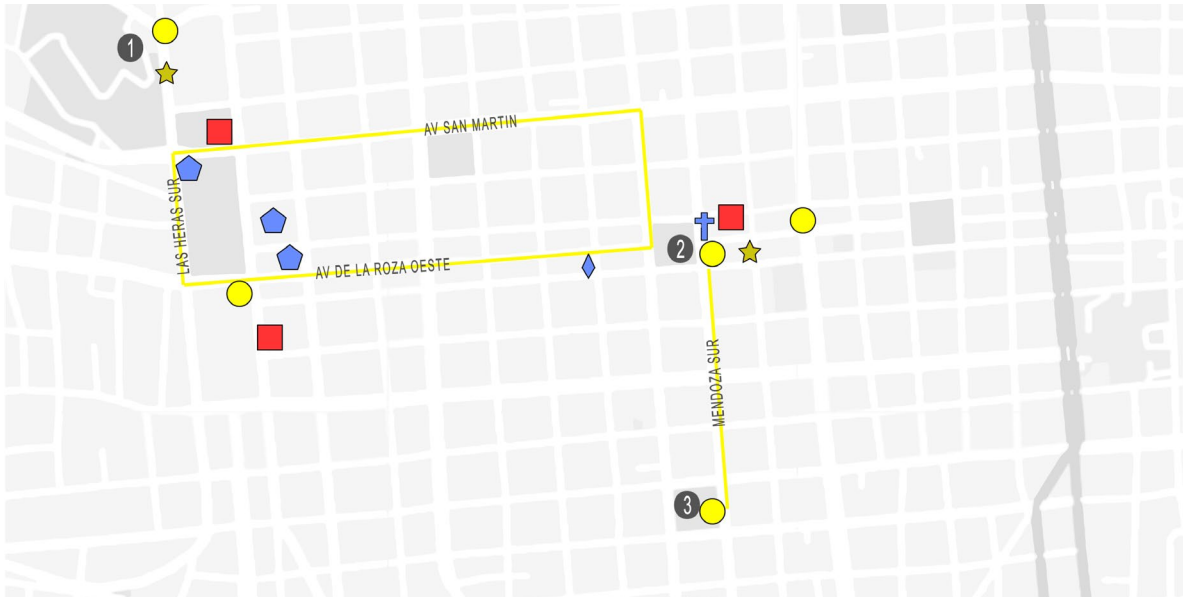

Figure 3. Mapping of the city of San Juan, Argentina. Source: Preparation by the Authors, based on the content developed by the workshop's participants.

The routes are represented in Figure 3 and begin at Parque de Mayo (point 1), surround the sociopolitical area, which coincides with the historic hub, in an act which the feminist movements have called "hugging the conservative sector of the city" and that, as can be seen on the map, bring together political groups located right at the turns of the march. This ends in a gathering in Plaza 25 de Mayo (point 2) or Plaza Hipólito Yrigoyen (renamed by citizens as Joroba (Little Hump) Square) (point 3), a space with the ideal qualities to have public acts of a political and cultural nature.

In San Juan, face-offs with law enforcement are not usual, according to what was mentioned in the workshop: the police stuck to escorting the protest and protecting important buildings.

Concepción

The group of participants highlights, among the many social movements that have taken to the streets of Concepción, the student protests for free quality education, citizen, union, indigenous, and feminist movements.

The routes followed by the march are shown in Figure 4.

They start from educational buildings, as mentioned during the workshop, such as the University of Bío-Bío (point 1) **4**, the University of Concepción (point 2), and Enrique Molina Secondary School (point 3). An important number of social organizations can be distinguished on the map, concentrated especially in the northeast of Concepción, which seem to be added by the route that runs along Av. Los Carrera. The Penquista protests have the particular feature of surrounding the city's sociopolitical center before often returning to their initial gathering spaces.

It is seen that the gatherings are mainly associated with squares and parks, among which Plaza de la Independencia, renamed Leftraru Square (point 4), and René Schneider Square, renamed Tribunales (point 5), both alongside buildings of sociopolitical importance, stand out. An interesting case is the recent use of the intersection of Av. Paicaví and Av. Los Carrera – renamed by the social movements as "Paicarrera" or Rotonda de la Resistencia (Roundabout of Resistance) (point 6)-, as a point for social gathering.

Regarding conflicts with law enforcement, these are associated with the same public spaces adjoining buildings of interest or educational buildings and gatherings.

4 The University of Bío-Bío is outside the boundaries of the map, as such it is only indicated on the plan to understand the origin of this route.

LA LUCHA URBANA POR LA RECONQUISTA Y LA REDEFINICIÓN DEL ESPACIO PÚBLICO EN AMÉRICA LATINA
FLORENCIA RETAMAL QUIJADA, JAVIERA PAVEZ ESTRADA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 98 - 111
ISSN 0717 - 3997 / 0718 - 3607

Figure 4. Mapping, city of Concepción, Chile. Source: Preparation by the Authors, based on the content developed by the workshop's participants.

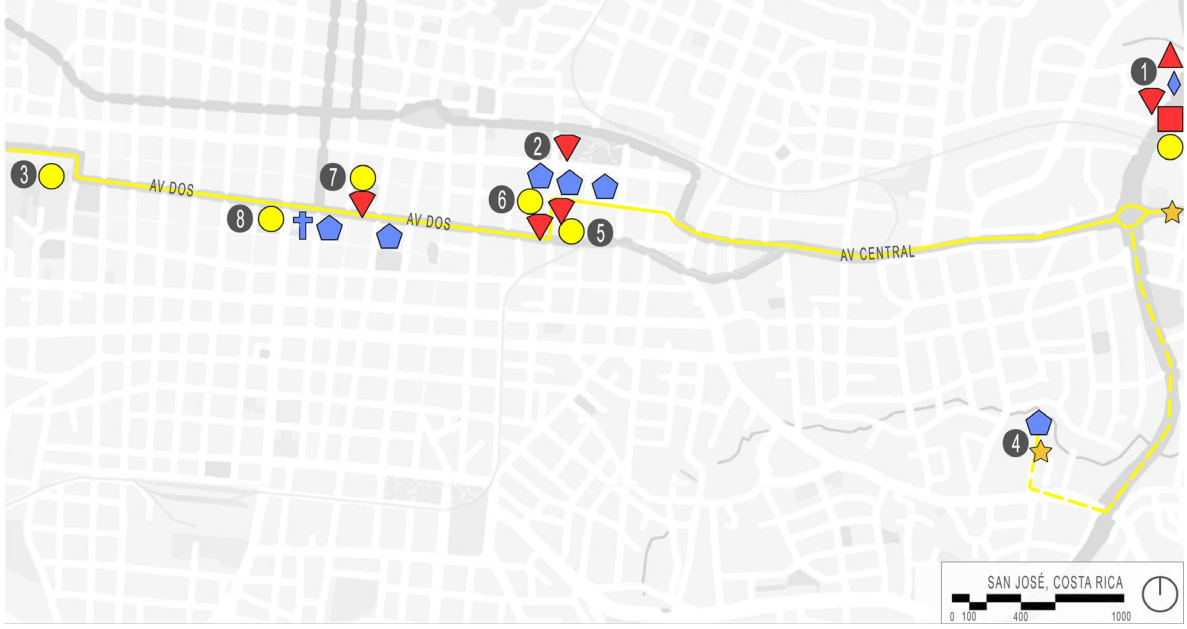

Figure 5. Mapping of the city of San José, Costa Rica. Source: Preparation by the Authors, based on the content developed by the workshop's participants.

LA LUCHA URBANA POR LA RECONQUISTA Y LA REDEFINICIÓN DEL ESPACIO PÚBLICO EN AMÉRICA LATINA
FLORENCIA RETAMAL QUIJADA, JAVIERA PAVEZ ESTRADA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PAG. 98 - 111
ISSN 0717 - 3997 / 0718 - 3607

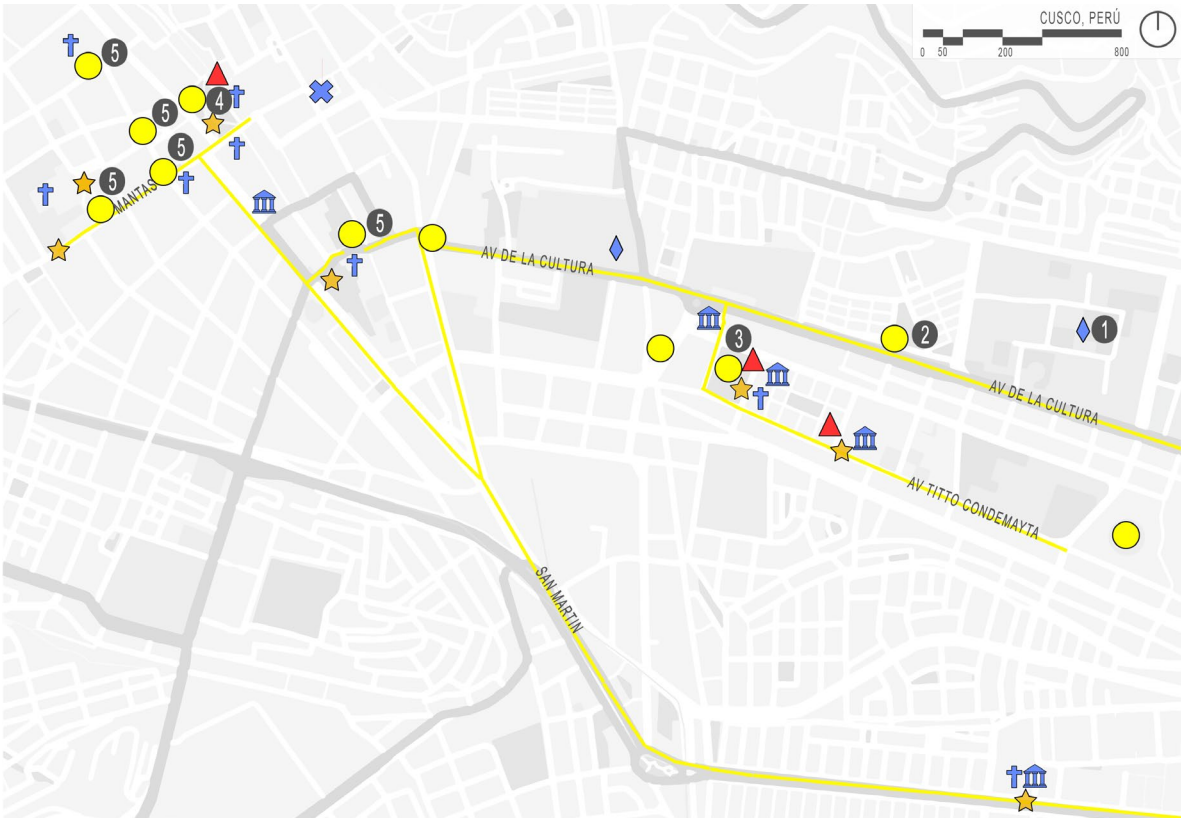

Figure 6. Mapping of the city of Cusco, Peru. Source: Preparation by the Authors, based on the content developed by the workshop's participants.

San José

During the discussions held in the workshop, the group of participants highlights the intervention of citizen and university movements in the Josefina protests. For this reason, it is not strange that the route, represented in Figure 5 is extremely linear, almost pilgrimage-like, beginning at the University of Costa Rica (point 1). The marches head along Avenida Central, crossing many streets, squares, and parks with Anglo-Saxon names that the citizens do not use, using instead, important buildings as reference. It is worth highlighting that the march goes through the sociopolitical heart of the city (point 2). In this sector, it pauses for a moment but does not stop until reaching La Sabana Park (point 3). However, on some occasions, it continues to the Government House (point 4). Regarding the gathering spaces, the importance of the University of Costa Rica in San José is left clear on the map, with this being the home to social organizations of a political, artistic, and social nature. Likewise, at the points associated with the political center of the city, it is possible to identify gatherings related to cultural organizations and public spaces.

According to comments made in the meeting, conflicts with law enforcement are pretty rare and the group of participants clarifies that the symbols placed on the map refer to two specific events. One associated with the Presidential House and the other, the university.

Cusco

In the discussion held during collective mapping, the group from Cusco, emphasized social movements against Presidential destitutions, protests against gentrification from the touristic nature assigned to the city, citizen movements, and indigenous movements.

The routes, illustrated in Figure 6, begin from spaces alongside the National University of San Antonio Abad del Cusco (UNSAAC) (point 1), and from the Mariscal Gamarra Park (point 2), where the mobilized masses meet. The linear nature of the marches is highlighted on the map, progressing along Avenida de la Cultura and Avenida Titto Condemayta, before stopping in Tupac Amaru Square (point 3), a central public space home to buildings of a sociopolitical nature and social organizations. The route ends in the squares of the historic hub of the city, mainly the Plaza de Armas of Cusco (point 4) and, on occasions, it heads back south. On the plan, it shows that the crowds mainly gather in squares associated with churches, part of the colonial urban

LA LUCHA URBANA POR LA RECONQUISTA Y LA REDEFINICIÓN DEL ESPACIO PÚBLICO EN AMÉRICA LATINA
FLORENCIA RETAMAL QUIJADA, JAVIERA PAVEZ ESTRADA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 98 - 111
ISSN 0717 - 3997 / 0718 - 3607

Figure 7. Mapping of the city of Tacna, Peru. Source: Preparation by the authors, based on the content developed by the workshop's participants.

Figure 8. Mapping of the city of Montevideo, Uruguay. Source: Preparation by the authors, based on the content developed by the workshop's participants.

LA LUCHA URBANA POR LA RECONQUISTA Y LA REDEFINICIÓN DEL ESPACIO PÚBLICO EN AMÉRICA LATINA
FLORENCIA RETAMAL QUIJADA, JAVIERA PAVEZ ESTRADA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PAG. 98 - 111
ISSN 0717 - 3997 / 0718 - 3607

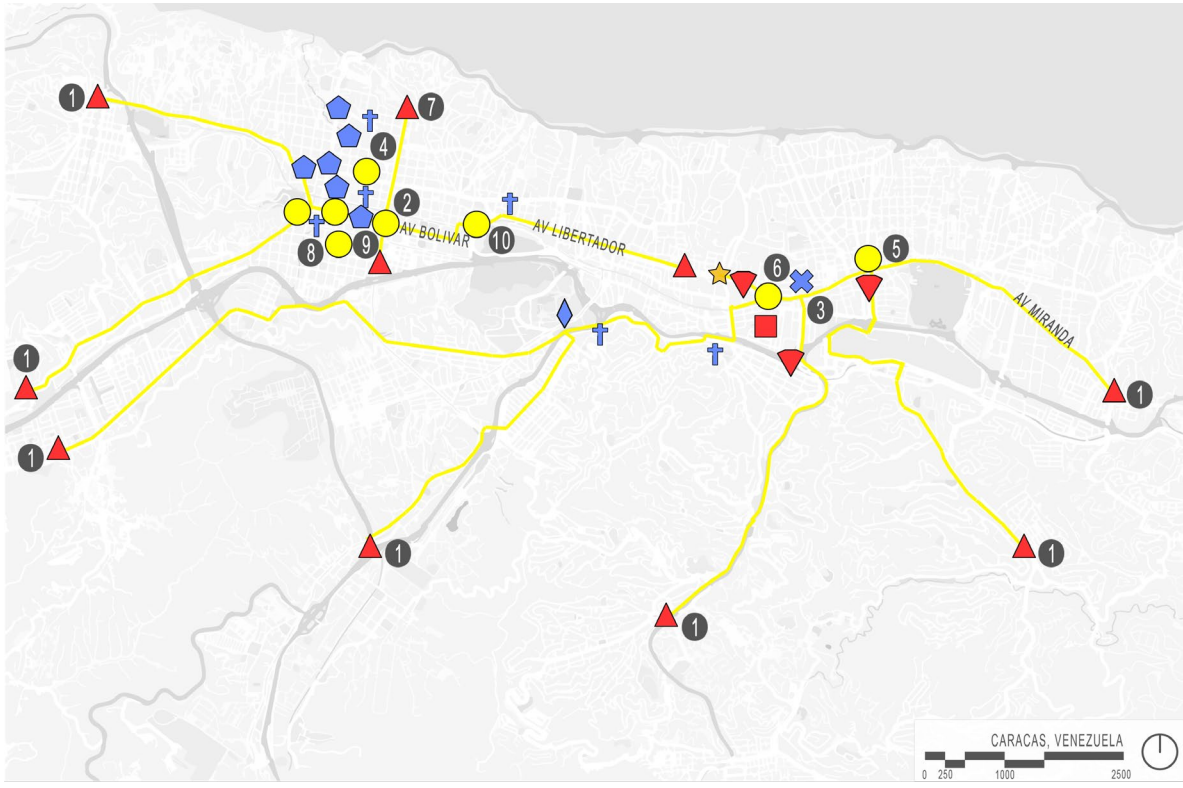

Figure 9. Mapping of the city of Caracas, Venezuela. Source: Preparation by the authors, based on the content developed by the workshop's participants.

planning whose intention was to suppress indigenous temples, and to a lesser extent, at highway intersections.

In the planimetric record, it is seen that conflicts with law enforcement tend to mainly happen in sectors alongside churches or sociopolitical buildings.

Tacna

During the dialog, the group of participants highlighted social movements against Presidential destitutions, feminist movements, agrarian organizations for a fair salary, and country folk of the area, cyclists groups, and protests against the EPS Reservoir (point 1) **5**.

The most common route, represented in Figure 7, starts at the intersection of Avenida Cusco, alongside the Jorge Basadre Grohmann National University (UNJBG) (point 2), with gatherings and cultural presentations, before then heading to the Plaza de Armas of Tacna (point 3). Sometimes it can head along Av. Bolognesi, passing Greg Albarracin Oval and Av. Celestino Vargas, to the EPS Reservoir.

There are many alternative routes because of the distance of certain important buildings of the center. The marches are linear and tend to make different stops in squares linked to social and political organizations. The gatherings tend to be associated with public spaces and significant sociopolitical buildings, while conflicts with law enforcement are coincidentally seen on the periphery of Tacna, as well as at municipal and educational buildings.

Montevideo

In this case, the group of participants referred to multiple social movements, among which they highlighted actions for remembrance, feminist movements, and student movements. The place where the Mothers and Family Members of

5 The EPS Reservoir is outside the map's boundaries, which is why it is indicated on the map just to understand the origin of the route mentioned.

LA LUCHA URBANA POR LA RECONQUISTA Y LA REDEFINICIÓN DEL ESPACIO PÚBLICO EN AMÉRICA LATINA
FLORENCIA RETAMAL QUIJADA, JAVIERA PAVEZ ESTRADA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 98 - 111
ISSN 0717 - 3997 / 0718 - 3607

Category/ City	Main social movements	Routes	Public spaces used as a political platform	Renamed public spaces	Conflicts with law enforcement
San Juan (See Figure 3)	• Not one [woman] less (Ni Una Menos) • National Campaign for the Right to a Safe, Legal, and Free Abortion	From Parque de Mayo(1) to Plaza 25 de Mayo(2), surrounding the socio-political and historical center. Circular in nature.	• Parque de Mayo(1) • Plaza 25 de Mayo(2) • Plaza de la Joroba (Hipólito Yrigoyen)(3)	• Plaza Hipólito Yrigoyen to Plaza de la Joroba(3)	Not normal
Concepción (See Figure 4)	• Student Protests for Free and Quality Education • Citizen Movements • Union Movements • Indigenous Movements • Feminist Movements	From educational buildings, surrounding the socio-political center, before returning to start. Circular in nature	• Plaza Leftraru (de la Independencia)(4) • Tribunales (Plaza Renée Schneider)(5) • Paicarrera or "Roundabout of the Resistance" (Paicaví Roundabout)(6)	• Plaza de la Independencia to Plaza Leftraru(4) • Plaza Renée Schneider to Tribunales(5) • Rotonda Paicaví to Paicarrera or Rotonda de la Resistencia(6)	Associated to public spaces alongside buildings of interest and educational buildings
San José (See Figure 5)	• University Movements • Citizen Movements	From University of Costa Rica(1) along Av. Central, passing through the socio-political center (2), to Parque de la Sabana(3). Linear in nature	• University of Costa Rica(1) • Parque de la Sabana(3) • Plaza de la Democracia y de la Abolición del Ejército(5) • Plaza del Museo Nacional de Costa Rica(6) • Plaza de la Cultura(7) • San José Central Park(8)	No renaming, but original names are omitted	Not normal
Cusco (See Figure 6)	• Social Movements against Presidential Destitutions • Protests against the Gentrification from Tourism • Citizen Movements • Indigenous Movements	From UNSAAC(1) and Parque Mariscal Gamarra(2), through the socio-political center, to the historic hub. Linear in nature	• UNSAAC(1) • Mariscal Gamarra Park(2) • Plaza Tupac Amaru(3) • Plaza de Armas del Cusco(4) • Squares of different churches(5)	No renaming seen	Sectors around churches and buildings of socio-political importance
Tacna (See Figure 7)	• Social Movements against Presidential Destitutions • Feminist Movements • Agrarian Organization for a Fair Wage • Cyclist Movements • Protests against the EPS Reservoir	From the intersection of Av. Cusco(2), to Plaza de Armas of Tacna(3) or on occasions to EPS Reservoir(1). Linear in nature	• UNJBG(2) • Intersection of Av. Cusco(2) • Plaza de Armas of Tacna(3)	No renaming seen	In the periphery of the city, alongside government and educational buildings
Montevideo (See Figure 8)	• Remembrance Actions • Feminisit Movements • Student Movements	From UDELAR(2), through the socio-political center, to the Legislative Palace(4) or Plaza de la Independencia(5). Linear in nature	• UDELAR(2) • Plaza de la Libertad(3) • Plaza de la Independencia(5) • Callejón de la Universidad (Plaza Frugoni)(7) • Plaza de los Desaparecidos en América(8) • Plaza Primero de Mayo(9)	• Plaza Frugoni to Callejón de la Universidad(7)	Not normal

LA LUCHA URBANA POR LA RECONQUISTA Y LA REDEFINICIÓN DEL ESPACIO PÚBLICO EN AMÉRICA LATINA
FLORENCIA RETAMAL QUIJADA, JAVIERA PAVEZ ESTRADA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PAG. 98 - 111
ISSN 0717 - 3997 / 0718 - 3607

Category/ City	Main social movements	Routes	Public spaces used as a political platform	Renamed public spaces	Conflicts with law enforcement
Caracas (See Figure 9)	• Pro-Government Movements • Opposition Movements	From residential sectors(1) to the historic hub(2) occupied by officialist movements or to the Municipality of Chacao(3) in the case of opposition movements. Linear in nature	• Plaza Bolívar(4) • Plaza Altamira(5) • Intersection of Av. Libertador and Av. Francisco Miranda(6) • Plaza Caracas(7) • Plaza de la Concordia(8) • José Antonio Luis García Park(9) • Plaza Morelos(10)	• One of the corners of Plaza Bolívar is renamed Esquina Caliente or "Hot Corner"(4)	Boundary of the Municipality of Chacao(3)

Table 1. Summary Table. Source: Preparation by the Authors.

Disappeared Detained Uruguayans organization (point 1) is housed, is marked on the map (Figure 8).

The marches tend to start from University of the Republic (point 2) and progress along Avenida 18 de Julio to Plaza Libertad (point 3). On some occasions, the route extends to the Legislative Palace (point 4) along Avenida Libertador or to Plaza de Independencia (point 5), in front of the Executive Tower (point 6). It is seen that the gatherings are mainly associated with public spaces, like Plaza de Independencia, Plaza de la Libertad, Plaza Frugoni (renamed "University Passageway") (point 7), Plaza a los Desaparecidos en América (point 8), and Plaza Primero de Mayo.

According to what was said in the workshop, conflicts with law enforcement are isolated and infrequent.

Caracas

From the start, the conversation with the group of participants about the Venezuelan capital, focused on two antagonistic social movements, the official one, supporting the Government, and its opposition, a planimetrically evidenced phenomenon (Figure 9). Due to the great size of Caracas, the routes of mobilizations begin from neighborhood gatherings (point 1) and head to the Central Area (point 2) and the so-called "Municipality of Chacao" (point 3), occupied by official groups and the opposition, respectively. The gatherings of groups supporting the Government take place in squares (with the groups in the so-called "Hot Corner" within Plaza Bolivar (point 4) standing out) and emblematic parks, alongside buildings of sociopolitical importance, in the historic hub. While those organized by the opposition focus on Plaza Altamira (point 5) and the intersection of Av. Libertador and Av. Francisco Miranda (point 6), from where they try to mobilize towards the Central Area. It is here where law enforcement begins to confront the protesters.

VI. FINDINGS

Based on the results obtained in the discussions, and the map developed in the collective mapping workshop within the Latin American Virtual Meeting – Utopías Liquidas in 2020, it is possible to state the following findings.

-In the maps, it can be seen that marches begin from one or several periphery gathering or organization points, before then heading towards the socio-political-economic heart of the cities.

-As for routes, two essential forms of movement of the marches are recorded: the most common is linear, seen in Tacna, Caracas, Montevideo, Cusco, and especially in San José de Costa Rica, while Concepción and San Juan, this is done in a circular march along their streets.

-Crowds are generally seen in the relevant public spaces and are also associated with sociopolitical buildings. Another phenomenon that is repeated on the participative elaboration maps are the gatherings at intersections, spaces that, despite not necessarily being planned as meeting places, have been redefined as a platform for social movements in Concepción, Cusco, Tacna, and Caracas.

-Regarding conflicts with law enforcement, it is worth mentioning that these involve different degrees of violence. In San Juan, Montevideo, and San Jose, police repression events, according to the stories of the workshop participants, are rare and are remembered as specific cases in the immediate history of the social movements. Participants from the cities of Concepción, Cusco, Tacna, and Caracas, on the other hand, talk about constant and systematic face-offs with the police -institutional law enforcement- the result of using the public space as a platform of protest, thus outlining the dispute for

LA LUCHA URBANA POR LA RECONQUISTA Y LA REDEFINICIÓN DEL ESPACIO PÚBLICO EN AMÉRICA LATINA
FLORENCIA RETAMAL QUIJADA, JAVIERA PAVEZ ESTRADA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 98 - 111
ISSN 0717 - 3997 / 0718 - 3607

their occupation as a political space, in an attempt to regain them. It is important to add that law enforcement, in these cases, tends to use excessive force, with the events ending with a group of detainees and not a small number injured.

The spaces of conflict tend to be linked to gathering places or buildings of sociopolitical and/or symbolic importance. In the case of Concepción and Tacna, a considerable part of their confrontations with law enforcement take place in educational spaces. In Tacna, Cusco, and also Concepción, they take place in spaces close to ecclesiastical buildings.

VIII. DISCUSSIONS

According to what was revealed in the virtual workshop dialog, the Latin American cities studied are continuously occupied by social movements with common demands, like citizen, feminist, and student organizations. The regular confrontations mapped by the participants, in four of the seven case studies, and those of a sporadic nature, in a further two, agree with what has already been said by Players (2018), Lin (2019), Harvey (2008), Fernández (2013), Swyngedouw (2018), Rizzo (2011), Navarro de Pablos ***et al***., (2021) and especially, Roitman (2012), that nowadays social movements dispute public spaces with institutionality, somewhere which, without a doubt, they have a legitimate right to, in an act to regain and define their political and democratic nature.

However, this phenomenon is not the only valuable investigation that the agora continues to have for the ***civitas***, but also the recording of intersections on busy avenues, marked as important landmarks for gathering in the mapping of the protests of Concepción, Cusco, Tacna, and Caracas, which, unlike the rest of the public spaces used as a platform of protest, do not correspond to a space designed for meeting, nor are they surrounded by relevant buildings. As was expected, the social movements that have risen with extraordinary force in the last decade in Latin America, turn to the public space to claim and present their demands and even, take from the institutionality, spaces destined for other purposes to satisfy their needs of platforms for political exposure (Retamal & Pavez, 2020).

The information collected regarding renaming urban spaces in five of the seven cities studied is especially interesting. This is the case of the "Plaza de la Joroba", previously Plaza Hipólito Yrigoyen in San Juan; "Plaza Leftraru", "Tribunales" and "Paicarrera" or "Roundabout of Resistance", previously Plaza de la Independencia, Plaza René Schneider and Rotonda Paicaví, respectively, in Concepción; the "Callejón de la Universidad", previously Plaza Frugoni in Montevideo; the omission of Anglo-Saxon names assigned to squares, parks, and streets in San Jose; and the "Hot Corner" corresponding to one of the corners of Plaza Bolivar in Caracas. This phenomenon, understood as a political act of suppression of one that is not representative, renaming it (or omitting it), to redefine and resignify it -outlined by Tai Lin (2019) and Roitman (2012), from an urban perspective, and by Castells (2006) from a more sociological side-, are literally and accurately presented in this study.

VIII. CONCLUSIONS

The research here manages to record the routes the protests follow, the public spaces where they begin, the streets they move along, and the sites where they end, as well as identifying the public space associated with conflicts with law enforcement, their adjoining buildings, and contexts. Starting from this mapping, accompanied by narrations of their protagonists and by crosschecking this information, a sustained and mass scale occupation of the public spaces in each case study is evidenced, and from the analysis of bibliographical sources, it can be confirmed that, despite the many obstacles that institutionality imposes on social mobilizations, in an attempt to eradicate the political nature of the public space, through the use of law enforcement, this continues to have for the ***civitas*** as a whole, symbolic relevance as a platform of revindication and to present their demands. It is for this reason that the groups of protestors dispute their reconquest and their redefinition as a political place in themselves.

This same phenomenon of dispute evidenced in the cases analyzed also reveals, the enormous importance the public space has, both for social movements and for institutionality. This explains, in part, the vigor with which protests have been repressed by institutionality and the sustained insistence of their political occupation by the groups of protestors.

Regarding the finding on the use of intersections as spaces for meeting and a political platform, it has been concluded that this matter does not just apply to a demand to conquer them, but rather, a phenomenon that sketches the aforementioned importance of political space for democratic disagreement; a character that, on being shut down, is imprinted, by the ***civitas***, in spaces set aside for other ends, in an act of symbolic resignification.

As for the renaming of public spaces shown in the research, it has been concluded that this is a redefinition dynamic both of the name, in its symbolic nature, to replace one that was not representative, and its practical scope, considering its use as a democratic political platform, in a resignification process for them.

LA LUCHA URBANA POR LA RECONQUISTA Y LA REDEFINICIÓN DEL ESPACIO PÚBLICO EN AMÉRICA LATINA
FLORENCIA RETAMAL QUIJADA, JAVIERA PAVEZ ESTRADA
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PAG. 98 - 111
ISSN 0717 - 3997 / 0718 - 3607

These conclusions, although premature to make a full reading of the phenomenon under study, document from a socio-urban perspective and through a direct participation method, in that the narration of their protagonists plays an essential role, the pulse of a historic political moment of social uprising, that is still shaking Latin American cities and their political events.

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TENSIONS FROM THE COMMUNITY GOVERNANCE OF RURAL WATER SANITATION SERVICES IN PERI-URBAN TERRITORIES (CHILE)[1]

TENSIONES DE LA GOBERNANZA COMUNITARIA DE SERVICIOS SANITARIOS RURALES EN TERRITORIOS PERIURBANOS (CHILE)

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A diferencia del modelo de concesión privada aplicado en zonas urbanas, los servicios sanitarios de las zonas rurales en Chile son gestionados por comités o cooperativas de agua potable rural (APR), bajo un modelo de gobernanza comunitaria. El presente artículo busca comprender cuáles son las tensiones que enfrenta la gobernanza comunitaria de APR en territorios periurbanos de capitales regionales y que constituyen la frontera del modelo de gestión privado del agua potable. A partir de un enfoque de ecología política y gobernanza híbrida, la investigación plantea la hipótesis de que, ante la expansión urbana y la creciente escasez de agua, el marco institucional neoliberal vigente en Chile tiende a favorecer una gobernanza del agua potable de corte mercantil en los territorios periurbanos. Con el fin de demostrar dicha hipótesis, se aplicó entrevistas semiestructuradas a informantes clave, como también observación participante, focalizándose en tres casos de APR ubicados en zonas periurbanas de la ciudad de Talca. El estudio realiza un análisis crítico del discurso de gestores comunitarios y reguladores gubernamentales, identificando sus percepciones y posiciones respecto de las transformaciones socio-ecológicas en curso y las tensiones en la gobernanza comunitaria. En congruencia con lo planteado, del análisis de discursos es posible inferir potenciales riesgos de privatización derivados de la implementación de la Ley N°20.998, que regula los servicios sanitarios rurales.

Palabras clave: Territorio, gobernanza, agua potable, servicios sanitarios rurales, Ley 20.998.

Unlike the private concession model applied in urban zones, rural water sanitation services in Chile are managed by rural drinking water (RDW) committees or cooperatives, under a community governance model. This article seeks to understand the tensions and conflicts faced by RDW community governance in the peri-urban territories of regional capitals, which are at the frontier of the private drinking water management model. Based on a political ecology and hybrid governance approach, this research proposes the hypothesis that, on facing urban expansion and water scarcity, the neoliberal institutional framework tends to favour drinking water market governance in peri-urban territories. With this aim, and through semi-structured interviews and participatory observation, focusing on three RDW cases located in the peri-urban zone of Talca, this study develops a critical discourse analysis of community managers and government regulators, identifying their perceptions and positions on current socio-ecological transformations, and community governance tensions. Consistent with the proposed hypothesis, from discourse analysis, it is possible to infer the potential risks of privatization, derived from the implementation of Law No. 20,998, which regulates rural water sanitation services.

Keywords: territory, governance, drinking water, rural water sanitation services, Law 20,998.

TENSIONES DE LA GOBERNANZA COMUNITARIA DE SERVICIOS SANITARIOS RURALES EN TERRITORIOS PERIURBANOS (CHILE)
ALEJANDRA ESTER DUARTE, JULIEN VANHULST, EDUARDO LETELIER
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 112 - 121
ISSN 0717 - 3997 / 0718 - 3607

I. INTRODUCTION

Water is an essential element for the vitality of ecosystems and for the health, production and social activities of human beings. For this reason, access to quality drinking water has been at the heart of social development policies since the second half of the 20th century.

In Chile, water is regulated by the Civil Code and the Water Code of 1981. The latter legal body allowed the privatization of this vital element, generating a great conflict between water as a human right, and water as a market commodity (Bauer, 2015; Larrain & Poo, 2010).

Currently, the main cities of Chile are supplied with drinking water through a sanitary infrastructure concession model with private companies, regulated by the Ministry of Economy, Development, and Tourism, under the supervision of the Sanitary Services Superintendence (SISS, in Spanish). However, the management model of drinking water in rural areas is different. The State retains its investor role, and transfers the operation of sanitary infrastructure to rural drinking water (RDW) committees and cooperatives, under mutual support and solidarity criteria, thus expressing a community-type governance (Fuster, Jara, Vidal & Abellá, 2016; Villarroel Novoa, 2012).

The setting up of the first RDW cooperatives harks back to the 1960s, with the adoption of the Basic Rural Sanitation Plan, financed by the Inter-American Development Bank (IDB), within the framework of the International Commitments taken on by the State of Chile in sanitary policy matters. Later stages of this IDB-financed program would take place under the Dictatorship, which promoted the creation of community organizations called RDW Committees, led by the local councils (Villarroel Novoa, 2012).

Since 2002, the Rural Drinking Water Program has been part of the Hydraulic Works Direction of the Ministry of Public Works. However, the roles and attributions related to the organization and supervision of RDW, would remain distributed among several regulatory bodies and public agencies. This situation was offset and regularized by Law N°20.998 of 2017, which regulated rural sanitary services (SSR Law). This law, defined the mission of these services in terms of "capturing, purifying, and administrating the distribution service, and in some cases, collecting and treating wastewater (Nicolas-Artero, 2016, p. 166). A formal service exclusive territorial concession mechanism was set up, alongside a regulated tariffing system, and a set of operation and quality standards, subject to inspection by SISS. The SSR Law, anticipating the governance issues these changes could generate, opened up the possibility that private companies could manage the service, if the committees and cooperatives were to fail to comply with the new legal regulations.

This scenario of institutional change overlaps with the scenario of global climate change and socio-territorial transformations, experienced by different Chilean rural localities. In this sense, alongside the historical phenomenon of population concentration in Santiago de Chile, an internal migratory process from smaller cities and rural areas to regional capitals has been strengthening for several decades (Maturana Miranda, 2017). In this way, these cities have been left subject to multiple transformation dynamics in their spatial and social structure, one of which is the emergence of peri-urban areas as a new type of territory, where forms of urban life spill over into rural spaces (Ávila Sánchez, 2009).

Said peri-urbanization dynamics can be seen in the Maule Region, which has a fifth of the homes served by RDW in Chile. In particular, since the passing of the latest Talca Regulation Plan, in 2011, the regional capital has tripled its urban area, adding some 20,000 people a year (Figure 2). In spatial terms, this demographic growth has followed an extensive pattern of urban land use, evidenced by the surge of new lots and gated communities in rural areas (PLADECO, 2017). In water terms, this rise in the peri-urban population has increased the demand for drinking water within the RDW, which has awoken the interest of the private drinking water concessionary of Talca, regarding the extension of its operation area, defined today by the urban limit.

In this context, this article seeks to understand the tensions and conflicts that the community governance of RDW face, starting from three RDW case studies located in the peri-urban areas of the city of Talca, the capital of the Maule Region. This research is based on the hypothesis that, on facing urban expansion and a shortage of drinking water, the neoliberal institutional framework in place in Chile tends to favor a market-cutoff drinking water governance in peri-urban territories. Considering this, and based on semi-structured interviews with key informants, and participant observation, an analysis was made of the discourse of the governmental regulators and managers of the RDW, identifying their perceptions and positions regarding the ongoing socioecological transformations.

II. THEORETICAL FRAMEWORK

In order to look at the background information and the problems related to the impact of the environmental, socio-territorial, and political transformations on the community governance of RDW, the theoretical framework was based on the contributions of political ecology to the territorial analysis and on those that focus from the hybrid governance approach, applied to the analysis of organizational, institutional, and resource tensions. First of all, the political ecology approach arose to analyze the processes of meaning, valuation, and appropriation of nature, that is not resolved either by the means of the economic valuation of the nature, nor by assigning

TENSIONES DE LA GOBERNANZA COMUNITARIA DE SERVICIOS SANITARIOS RURALES EN TERRITORIOS PERIURBANOS (CHILE)
ALEJANDRA ESTER DUARTE, JULIEN VANHULST, EDUARDO LETELIER
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 112 - 121
ISSN 0717 - 3997 / 0718 - 3607

ecological standards to the economy (Leff, 2003). Thus, political ecology addresses nature and the environment as consubstantially politicized objects of study (Ávila-García, 2016). In this sense, the territories are considered as relational, social, historical, and spatial constructs, subject of dispute between different social groups, who seek the validation of certain discourses/works and the institutionalization of socio-environmental arrangements (Boelens, Hoogesteger, Swyngedouw, Vos & Wester, 2016). Upon studying the assigning of the collective practices and ways of life in their territorial dimension, the political ecology approach looks to overcome the interpretation of the territory as a simple "scenario" for collective life (Neil, 2013; Porto-Gonçalves, 2009), establishing the relationship and exchange between economic practices, shared meanings, and the means of identification with the territory where they take place, as an object of study,. From this point of view, it is possible to articulate the structural and agential dimensions present in the territories, observing the tensions and conflicts between the hegemony of certain dominant socioeconomic models, and their dynamics of de-territorialization, on one hand, and the established praxis of the social players in the territories, on the other (Castoriadis, 1975).

Applied to the field of the water resources of a territory, political ecology looks to decipher the nature of the relationships of power between individuals and social groups, manifested materially, discursively, economically, politically and/or culturally. In this way, it allows finding the social players who, ultimately, hold the power, according to the control or access, and whoever is excluded from decision-making on water governance (Swyngedouw, Kaïka & Castro, 2016). This makes it possible to address the phenomenon of the neoliberalization of water, present in Latin America and in Chile since the 1980s, pointing out the policies based on market development, and the legitimacy of the private company as the most rational force to assign water use.

As a complement to political ecology, the theoretical approach of governance allows considering the ways in which institutions, as well as public and private players, intervene in the formulation and application of public policies (Cerrillo & Martínez, 2005). According to Manganelli, van der Broeck and Moulaert (2020), governance is defined as any means of continuous coordination of social relationships, characterized by a reciprocal and complex interdependence. This seeks to account for all types of initiatives and interventions by the different socio-political players (public and private, guided by their own interests, and rationalities), at different geographical scales (from the local to the global), to govern the social problems. Along this vein, Swyngedouw and Jessop (2006) distinguish four main forms of governance: (i) the anarchy of mercantile exchange; ii) the hierarchy of imperative coordination in and through organizations, including the State (Kooiman, 2005); iii) the network heterarchy of self-organizations; and iv) the unconditional commitment associated to community love, loyalty, and solidarity. These ways of governance are not expressed as pure matters, but rather tend to coexist in complex social systems, under dynamics of conflict, mediation, synergy, co-construction, or destruction, leading to forms of hybrid governance.

According to Manganelli ***et al.*** (2020), the hybrid nature of governance is at the center of the different tensions reported in the literature, classified as organizational, institutional, and of resources. Concretely, organizational tensions emerge from the needs of administrative rationalization and the greater professionalization of management, that face horizontal and participative forms of governance. At the same time, the institutional tensions refer to the relationships between different sociopolitical regimens, corporate structures, political agendas, and organizational and community cultures. Finally, the tensions of resources arise from the need to access and guarantee scarce resources for the operation, development, and scaling of the organization in a context of competence and dispute over said resources.

As for the water resources, the governance model allows analyzing the interaction between the political, social, economic, and administrative players/systems of the territory and the environment, for the provision of drinking water. For said governance to be real and effective (i.e. good governance), it is necessary to have organizations that regulate and manage the drinking water supply service, under a suitable legal framework, so that this meets the environmental, economic, social, and political needs of the territory (Dupuits, 2014; Zurbriggen, 2014). This requires a more horizontal and decentralized point of view in decision-making, which involves different areas of the Government that can directly or indirectly condition water policy (Dupuits, 2014; Nicolas-Artero, 2016).

III. CASE STUDIES

This research focuses on three RDW case studies, located in the peri-urban area of the city of Talca (Figure 2), namely: the San Valentín de Lircay RDW Committee, the Marta-Mata Oriente RDW Committee, and the Huilquilemu RDW Committee. These RDWs were chosen using three criteria: i) the high growth rate in the number of homes supplied; ii) the location within the urban expansion area of Talca; and iii) the high growth rate in the number of dwellings of the surrounding territory. An analysis of secondary

TENSIONES DE LA GOBERNANZA COMUNITARIA DE SERVICIOS SANITARIOS RURALES EN TERRITORIOS PERIURBANOS (CHILE)
ALEJANDRA ESTER DUARTE, JULIEN VANHULST, EDUARDO LETELIER
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 112 - 121
ISSN 0717 - 3997/ 0718 - 3607

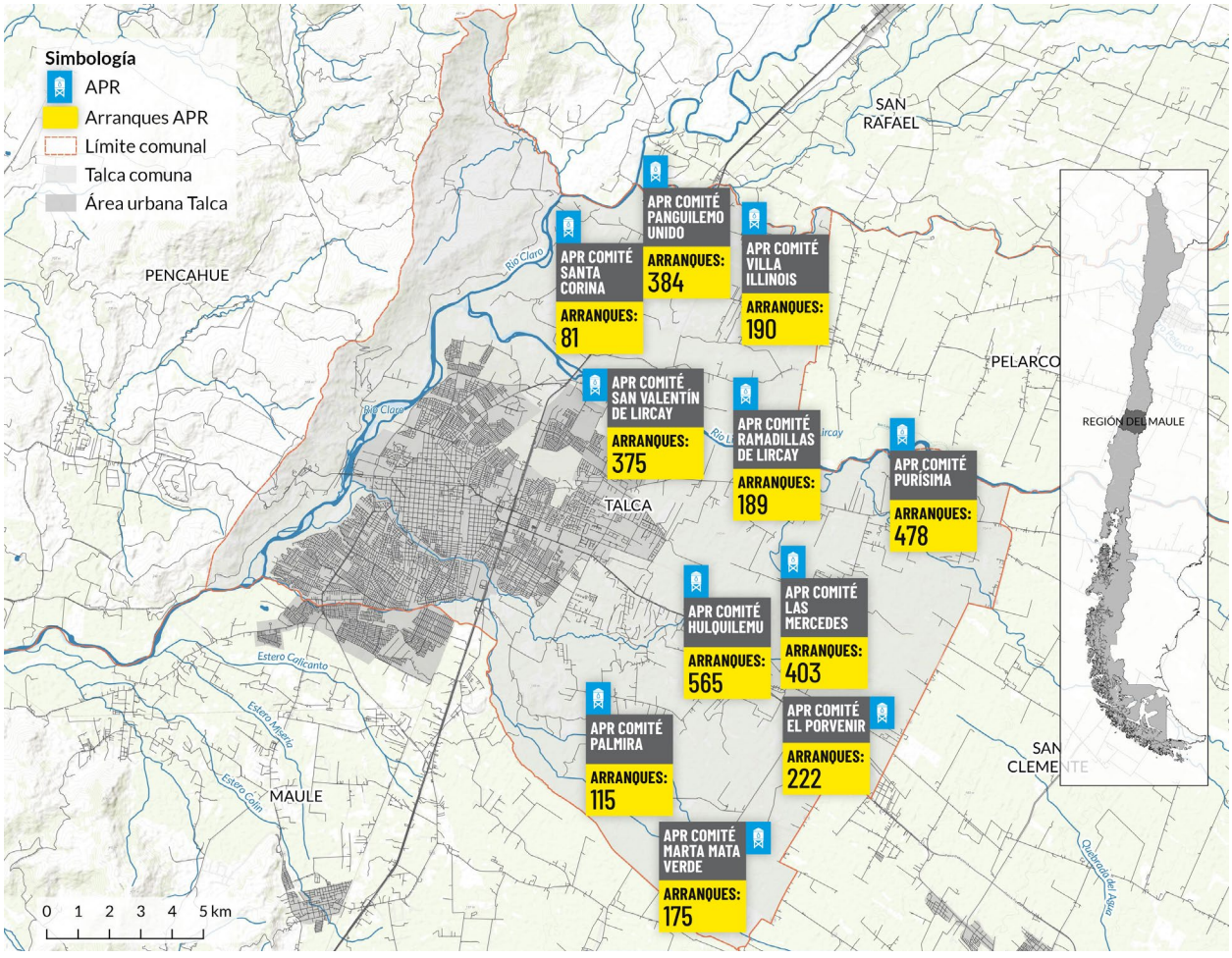

Figure 1. Map of the Rural Drinking Water Committees of the commune of Talca by 2017. Source: Preparation by the Authors based on information from the National Statistics Institute (INE) and Spatial Data Infrastructure (SDI).

information was made for the selection process, based on a longitudinal comparative and observational design (Hernández Sampieri, Fernández Collado & Baptista Lucio, 2003), using data spatialization techniques (Santos Preciado, 2020), and the ArcGIS geographic information system.

The localization of the different RDW committees of the commune of Talca is presented in Figure 1, with the corresponding number of rural drinking water household connections by 2017 (i.e. homes supplied). The polygon marked out by the red line represents the administrative boundaries of the commune.

Figure 2 illustrates in blue, the three committees chosen as case studies. In each case, the percentage variation of the number of homes supplied by each rural drinking water system between 2011 and 2017 has been highlighted. The urban expansion area of this period, authorized by the Talca Regulatory Plan approved in 2011, is shown in pink. Likewise, the dates of the Decrees ruling this a drinking water shortage area, established by the General Water Direction for the northeast and south areas of the commune of Talca, are pointed out.

IV. METHODOLOGY

The research aimed at understanding the perspective and position of the players related to the RDW on the peri-urban transformations of the city of Talca, and their consequences in the governance of drinking water, delving into their experiences, opinions, and meanings. That is to say, in the way they subjectively build their reality (Hernández Sampieri ***et al***., 2003,

TENSIONES DE LA GOBERNANZA COMUNITARIA DE SERVICIOS SANITARIOS RURALES EN TERRITORIOS PERIURBANOS (CHILE)
ALEJANDRA ESTER DUARTE, JULIEN VANHULST, EDUARDO LETELIER
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 112 - 121
ISSN 0717 - 3997 / 0718 - 3607

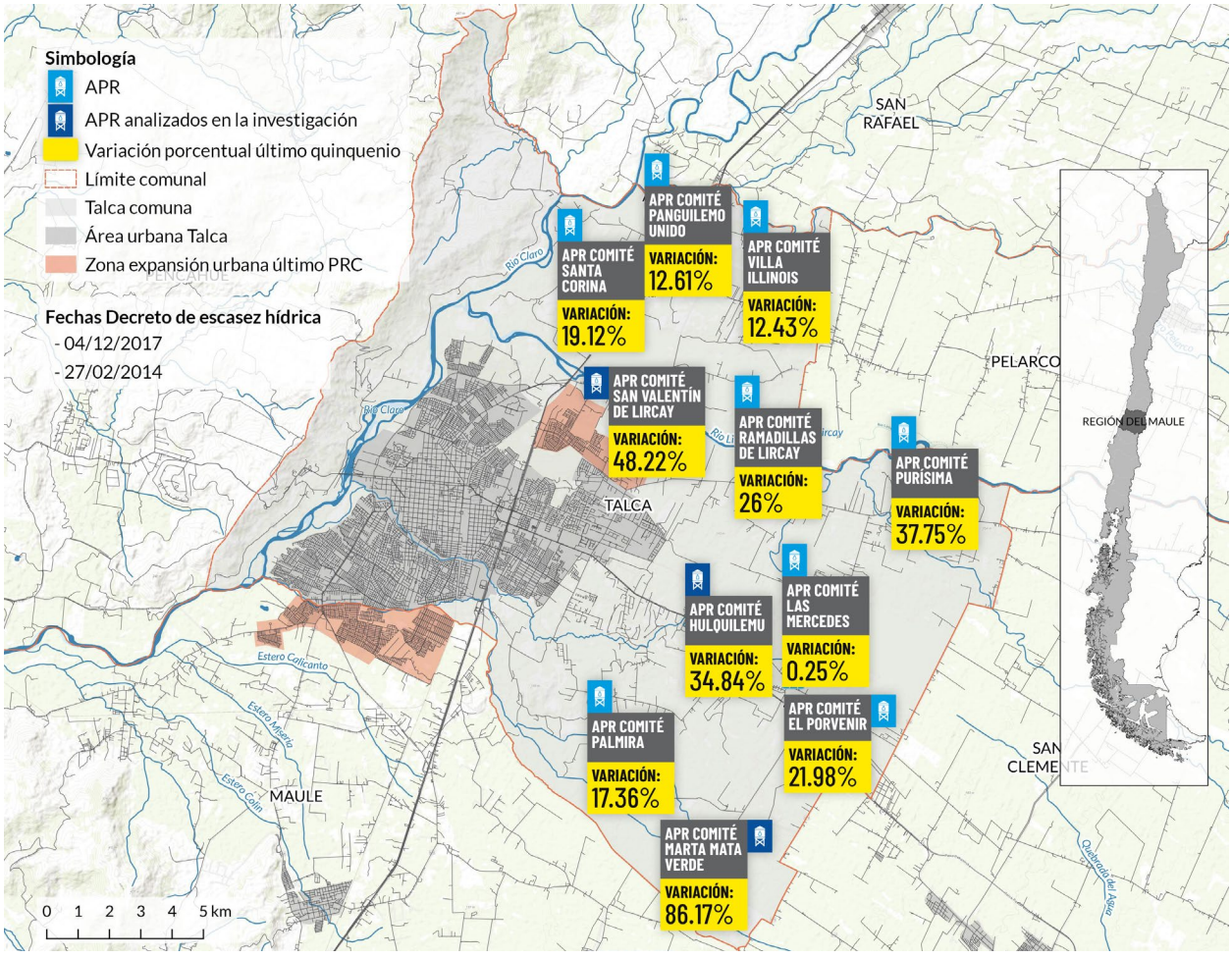

Figure 2. Map of the case studies and the demographic and water transformations of the commune of Talca between 2011 and 2017. Source: Preparation by the Authors using data from the National Statistics Institute (INE, in Spanish), the Municipality of Talca, the General Water Direction (DGA, in Spanish), and the Spatial Data Infrastructure (SDI).

p. 364). A qualitative approach was used for this task, using an observational design applied to the three case studies, based on in depth interview techniques, participative and non-participative observation (Rodríguez Gómez, Gil Flores & García Jiménez, 1996).

The choice of the players for the semi-structured interviews responds to a non-probabilistic and by convenience standard sampling (Hernández Sampieri ***et al***., 2003), that sought to collate the perceptions of RDW managers and regulators. Interviews were made in this way, to two people who worked as RDW regulators in the General Water Direction (DGA) and in the Hydraulic Works Direction (DOH, in Spanish) of the Ministry of Public Works (MOP, in Spanish). On the other hand, in the case of the managers, the Presidents of the RDW committees considered as case studies, were interviewed. In addition, a conversation was held with the Manager of the Cumpeo RDW, who coordinates the federative process of the RDW.

The participative observation consisted of two workshops for the constitution process of a regional RDW federation, to which 20 organizations attended. The non-participative observation consisted in attending an Assembly of the Huilquilemu RDW, with the participation of the board and 30 partners. Table 1 outlines the sample used.

The processing of the semi-structured interviews was done using the Nvivo software, which allowed categorizing the discourse elements, considering the environmental, socio-territorial, and political dimensions. The critical analysis of the discourse was done using the 3D model of the discourse proposed by Fairclough (2013), considering the descriptive, interpretative, and explicative perspectives.

TENSIONES DE LA GOBERNANZA COMUNITARIA DE SERVICIOS SANITARIOS RURALES EN TERRITORIOS PERIURBANOS (CHILE)
ALEJANDRA ESTER DUARTE, JULIEN VANHULST, EDUARDO LETELIER
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 112 - 121
ISSN 0717 - 3997/ 0718 - 3607

Technique	Institution/Space	Number of Participants / Interviews
Participative Observation	Workshop 1 – RDW Federation Workshop 2 – RDW Federation	15 RDW Presidents of the Maule Region 20 RDW Presidents of the Maule Region
Non-Participative Observation	Half-yearly assembly – Huilquilemu RDW	RDW President Former RDW President RDW Secretary 30 RDW members/users
Semi-structured interviews	Cumpeo RDW Huilquilemu RDW Marta-Mata Verde RDW San Valentín de Lircay RDW DGA (MOP) DOH (MOP)	1 RDW federative process coordinator 4 RDW Presidents 2 Regulators

Table 1. Sample summary. Source: Preparation by the Authors

V. RESULTS

Problems regarding water shortage and the valuation of drinking water

In general, it is possible to state that both the regulators and the managers identify shortage as a problem, and they associate it to drought and climate change. They state that, although there are no supply issues in the territories they represent, the level of the current wells has dropped, and they have a lower volume of water than in previous years due to less rainfall recorded in the area. On the other hand, the managers perceive that there is a sustained increase in water consumption due to the rise in population in peri-urban sectors, and the higher consumption in the homes. Facing this unsustainable equation in time, the Committee Managers have turned to holding talks in assemblies, and in local schools, to sensitize the population about the use of drinking water for human consumption, and so they avoid using it to water gardens and to fill swimming pools. In the case of the regulators, they acknowledge the bad practices generated within the communities, stating that people do not care about the value of water, given that its cost is very low, although this attitude is starting to change. For example, this is what an official of the General Water Direction stated: "As I told you, the drought effect is across the board, and this is due to the lack of rainfall, and that the fact that the aquifers have not had water is an enormous issue. Today, the population is noticing this because it is on the media" (Regulator 2, General Water Direction; free translation).

Territorial and demographic transformations in peri-urban areas of the commune of Talca

In general terms, both the regulators and the managers interviewed acknowledged the changes in the peri-urban territories of Talca, based on a reconfiguration of the rural areas that goes hand in hand with the expansion of the Regulatory Plan. Facing this, most of the interviewees highlighted the arrival of new users in recent years, which has led to an increase in the drinking water demand, and that leads to the need of new feasibility studies and to the appearance of supply network extension projects. Along these lines, a manager of the Marta-Mata Verde RDW commented the following:

"With the issue of the lotting and new roads, we know that new partners will come. That is what we have foreseen, and for this reason, our committee is always looking to the future" (Manager 1, Marta-Mata Verde RDW, free translation).

These latest actions have been complicated due to a series of problems, among which the following stand out: i) the long wait (8 to 10 years) and the bureaucratic weight to make studies and projects; ii) the limited proactive behavior and the prioritization of the needs of the committees, and iii) the lack of coordination with the institutions responsible for implementing these.

Social transformations: individualism and low participation in community processes

The aforementioned territorial and demographic transformations are also expressed in changes in the type of population living in peri-urban areas. In this way, it is possible to identify two different social groups living in the same territory: a historic "older" group with low resources, and a recently arrived or "newer" group, with greater purchase power who generally emigrate from the suburbs. In the eyes of the managers, these groups are clearly differentiated. On one hand, practices of over-consumption of drinking water are seen among the new users, even doubling the volume

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ALEJANDRA ESTER DUARTE, JULIEN VANHULST, EDUARDO LETELIER
REVISTA URBANO Nº 44 / NOVIEMBRE 2021-ABRIL 2022
PÁG. 112 - 121
ISSN 0717 - 3997 / 0718 - 3607

consumed by the older families. On the other hand, they have a low participation in assemblies and in activities within the community, along with a reluctance to take on any role in the organization. In this sense, the new partners-users limit their role to that of a consumer of drinking water services, typical of a standard mercantile governance. In this same vein, most of the managers interviewed highlighted being concerned for the generation that will replace the current RDW leaders, characterized on being elderly volunteers who often take on more than two roles at a time. Along these lines, a manager of the San Valentín de Lircay RDW stated the following:

> "Those of us who are members of the Board have to use our own time for the community activity, which in my case is not a major issue because all citizens should be available to work with one another. But this doesn't always happen and it is a weakness that we've begun to talk about, about the lack of people, those who are not available to do anything, the next generation. It is hard to stay afloat when there is no interest at play" (Manager 3, San Valentín de Lircay RDW, free translation).

Ambivalence facing the changes in the rural drinking water regulation

The acknowledgment for the dedication and the work of RDWs has been highlighted by all those interviewed. In particular, their history, their low costs, and their personalized and more human attention, among other aspects, is valued. However, facing the changes introduced by the SSR Law, important discrepancies were expressed between the community managers and the regulators interviewed. The community managers stated that, although the SSR Law has been promoted, the institutionality has major issues. In particular, they highlight the lack of training to be able to face the changes in the administration of the RDWs. Meanwhile, the regulators consulted indicated that the State is aware of the difficulties that RDWs face, especially regarding the changes within the SSR Law. Likewise, they acknowledge that there are few professionals available to work onsite to accompany the RDWs in the region.

Facing this scenario, the RDW managers have expressed some uncertainty and insecurity towards the future of their organizations and the community governance. They indicate certain "legal loopholes" that would allow "turning the RDWs into a business", facilitating their later transfer to profit-making companies. Specifically, they see how the scenario of the SSR Law frames out new concerns and demands for the leadership roles and that, on being performed ***ad honorem,*** they imply a disincentive for community participation. In this regard, a leader of the Marta-Mata Verde RDW stated the following:

> "The people are not prepared. If you have an ***ad honorem*** role, and the people recognize you, they can't demand more than what they are able to do. For example, I resigned in February, I will not assume the responsibilities of the Law. They changed things and gave more responsibilities to the leaders, giving them nothing in exchange, they are just demands, and there's not even a salary". (Leader 1, Marta-Mata Verde RDW, free translation).

In the case of the regulators, they are sure that the SSR Law provides greater representativity and institutionality to the RDWs, which have not been achieved for many years. On the other hand, they see in the regulation of the prices, and in the changes in the administration, an opportunity to improve current procedures, both in the management, and in the drinking water distribution, consumption, and treatment in rural areas. For this, an official of the General Water Direction outlines the following: "What is happening is that I think that today the Law will give the Committees strength to become small sanitary companies. They're going to become small companies... perhaps this will happen in the future". (Regulator 2, General Water Direction, free translation).

Finally, the managers and regulators evoked very different perceptions regarding the ties that are generated within rural drinking water governance in the commune of Talca. In particular, the managers have characterized the ties to the State and the sanitary companies as bureaucratic, neither participative nor cooperative. Considering this, they demand greater participation of the State and, therefore, they have taken on self-management of their different problems. This lack of articulation is also expressed in the conflicts between the community governance of the RDWs and the hierarchical governance of the State Bodies like the Housing and Urbanism Service (SERVIU, in Spanish), which drives the construction of housing without consulting the respective RDWs about the feasibility of supplying these dwellings. Bearing this in mind, a leader of the Huilquilemu RDW mentioned the following:

"What SERVIU does is mess up the system for the RDWs. They think that it's easy for them to build houses, and for us to provide the water. They don't care nor ask if there's water there or not. All that weight falls upon us. They put the cart in front of the oxen, as a human settlement needs water before it's set up". (Leader 2, Huilquilemu RDW, free translation).

VI. DISCUSSIONS

Using the critical analysis of the discourse contained in the interviews made to managers and regulators, it is possible to uncover inter-textual and contextual elements that can be organized along three lines: i) the institutional

TENSIONES DE LA GOBERNANZA COMUNITARIA DE SERVICIOS SANITARIOS RURALES EN TERRITORIOS PERIURBANOS (CHILE)
ALEJANDRA ESTER DUARTE, JULIEN VANHULST, EDUARDO LETELIER
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and resource governance tensions, generated by peri-urban socio-territorial and environmental transformations; ii) the organizational governance tensions, derived from the need to rationalize or modernize RDWs management, as a result of the implementation of the SSR Law; and iii) the tensions of institutional governance, arising from the projections of the SSR Law, and the implicit risk of privatization of the RDWs. Each one of these aspects is elaborated below.

Governance tensions generated by peri-urban transformations

As it was laid out, the intra-regional migration, the extensive growth of housing, and the modifications in the Talca Regulatory Plan, together with the dynamics of climate change, have led not just to an increase in drinking water demand, but also to an important social transformation in the peri-urban sectors of the city, expressed in the ways in which the new peri-urban inhabitants perceive, appropriate, and live in their own territory (Beck, 2002).

Therefore, while the increase of drinking water demand generates governance tensions related to guaranteeing the water resource (for example, between the RDWs and SERVIU), the appearance of individualist and instrumental cut-off behaviors and logic expresses an institutional-type governance tension, that weakens the current community governance in favor of a mercantile cut-off one.

Governance tensions derived from the implementation of the SSR Law

On seeing the discourses and perceptions towards the implementation of the SSR Law, an organizational tension emerges, derived from the need to professionalize the management to assume more complex tasks, reducing the historic role taken on voluntarily by local social leaders in these tasks. Other studies on RDW had already targeted the issues of limited technical competences, old age, and difficulties to find people willing to take on organizational roles based on voluntary work (Fuster ***et al***., 2016).

Governance tensions derived from the projections of the SSR Law

Regarding the projection of the SSR Law, the differences of opinion among the interviewees shows a clear institutional tension. On one hand, the State regulator agents point out the improvement and modernization of the RDWs with the new Law, representing the perspective of a hierarchical subsidiary-type governance, which has marked the guidelines in most of Chilean public policy in recent years (Saldomando, 2009). The business and State players meet under this model, where the management skills in the commercial area are guarantees of competence for the public administration, thus consolidating a neoliberal technocracy that started with the Dictatorship. On the other hand, from the perspective of the community managers, the recent SSR Law introduces new standards and regulations that, according to the managers, could lead to the "conversion into businesses" of the RDWs, opening the door to the possibility of being replaced by private sanitary companies that operate in the urban areas under concession. Facing this, some RDWs have reacted defensively, suggesting the need to create a Federation of Rural Sanitary Services that would allow having an influence on regional public investment decisions, and also developing actions of common interest, looking to face the new regulatory framework.

VII. CONCLUSIONS

In this article, the tensions that RDWs community governance face for environmental, socio-territorial, and political transformations of the peri-urban territories have been problematized. In this way, starting from three case studies, the critical analysis methodology of the discourse has allowed describing and contrasting the perspectives of the RDW managers and regulators, unveiling the differences regarding how these players conceive the present and the future of these services. They especially highlight different tensions between community, hierarchical, and mercantile governance, both at a resource and at an organizational and institutional level.

From this point of view, although the RDWs have managed to meet their goal of supplying drinking water in rural areas since their creation in the last century, and have continued to be highly valued by their respective communities, the ongoing transformations are opening the door to an insecure scenario for the community governance of RDWs. This is mainly due to the weakening of the social fabric of the RDWs and the projections and challenges from the implementation of the SSR Law, with its underlying risks of privatization. In this sense, the SSR Law appears to be strengthening the centralizing guidelines of the State, starting from a greater regulation and control of the management and administration of the RDWs, based on the model of the private concessionary companies, of urban sanitary services. It is from this context that the defensive strategies promoted by the RDW managers in the SSR Law are explained, which show a clear willingness to maintain their autonomy and their community governance model.

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FOCUS AND SCOPE

Urbano (*Digital ISSN: **0718-3607** / ISSN printed: **0717-3997**)* has been published by the Department of Planning and Urban Design at the University of the Bío-Bío since 1997.

Urbano specializes in urban-territorial issues and its main objective is to explore, through the articles it publishes, the territorial dimension of the study of the city and the territory. *Urbano* is open to a variety of approaches and methodologies, especially to multidisciplinary and interdisciplinary research that makes it possible to visualize the city and region from a broad context that is applicable to urban and territorial management.

Urbano is intended for researchers and academics whose manuscripts provide a critical vision of the urban phenomenon and its consequences for the transformation of medium-sized cities and territories at the local and regional level, mainly in the Ibero-American arena, but also regarding the existing problems in the global south.

Urbano accepts scientific articles on unpublished research results, master's and doctoral theses, and conference proceedings. It also publishes review articles that are within the journal´s general focus and contribute new knowledge on current issues or concepts currently in development. *Urbano* is published biannually in the second half of May and November in digital and paperback editions. It accepts articles written in Spanish and English. The submitted articles must be original and unpublished and must not simultaneously be before another journal or editorial body for consideration. It prints general issues with assorted manuscripts within its focus and scope, and occasionally publishes monographic issues resulting from thematic calls for papers, or as a means of publishing core topics related to national and international conferences. The submission of manuscripts presupposes that authors have knowledge of and accept the Editorial Norms and Guidelines for Authors.

Urbano is indexed in Emerging Source Citation Index de Clarivate Analytics, Redalyc, Latindex, Avery Index, DOAJ, Dialnet, Redib, REBIUN, EBSCO, Open Archives, JournalTOCs, Actualidad Iberoamericana, ARLA, ERIHPLUS y HAPI.

Urbano adheres to the San Francisco Declaration on Research Assessment (DORA).

INDEXATION

AVERY Index, DOAJ, EBSCO, Latindex, Actualidad Iberoamericana (IC), ARLA, RedAlyc, REDIB, DORA, Emerging Source Citation Index de Clarivate Analytics, ERIHPLUS y HAPI

EDITORIAL POLICIES AND PUBLICATION ETHICS

Urbano's Editorial Team is committed to the scientific community and to ensuring the ethics and quality of the articles published.

1. Publication in *Urbano*
Urbano does not charge authors any fees for submission, the article-review process or issue production

The journal launches calls for papers that define the thematic lines of the following issues and are announced on its website. In addition, the journal maintains an open window for the submission of manuscripts that can then be published in issues that are in the process of publication.

Articles may be submitted in Spanish or English via the online platform and must conform to the format indicated in the Editorial Norms and Guidelines for Authors. Failure to comply with these editorial norms means the article will be rejected during the editorial process or retracted if it has already been published.

To be eligible to publish in *Urbano,* the following are required:

1. Articles must be written in scientific format and be the results of the author´s own research. *Urbano* does not publish applied research articles.
2. Articles must be unpublished and must not simultaneously be before another journal or editorial body for consideration.
3. *Urbano* opposes academic plagiarism and therefore rejects any article with fraudulent data, compromised originality or duplicate submissions.
4. Articles must omit all references to the identity of the author(s) within the text. The names and affiliations of the author(s) should be given on the online platform.
5. Articles must not cite the sources of research funding in the text, but rather in a footnote on the first page of the article. The names and affiliations of the author(s) should be given on the online platform.
6. Articles must include the bibliographic citations to the research on which the paper is based and these must be compiled in a final "References" section.
7. Articles must include a minimum of 20 bibliographic references, of which at least one third must be less than or equal to 5 years old.
8. Articles are limited to 3 author self-citations.

2. Peer and editorial review process

Once the article is received, the review process is divided into two parts: editorial review and peer review.

Firstly, papers are subject to preliminary evaluation by the Editorial Committee, which reviews the article´s conformity to: the Editorial Norms and Guidelines for Authors, the journal´s focus, the theme of the call for papers in the case there is one, and compliance with minimum criteria for quality and rigor. As of 2019, the plagiarism software Turnitin will also be used to complement this evaluation, which may culminate in the rejection of the article or its progression through the editorial process.

Once the pertinence of an article has been established, it is subject to double blind peer evaluation. The panel of experts is comprised of national and international researchers unaffiliated with the publisher in 80%, who are specialists in different areas related to urban planning. These must not have any conflict of interest with respect to the research, the author(s) and/or the financers of the investigation. All evaluations are objective, and the reviewed articles will be treated confidentially. Experts carry out reviews according to the *Urbano* evaluation guidelines and make one of three recommendations to the editor:

PUBLISHABLE (changes suggested by the reviewer are optional and those of the editor are mandatory).
PUBLISHABLE WITH MODIFICATIONS (changes suggested by evaluator and editor are obligatory).
NOT PUBLISHABLE (rejected by peer assessment)

If there is any discrepancy between evaluators, the article is sent to a third to arbitrate. If this peer assessment process considers the article to be PUBLISHABLE WITH MODIFICATIONS, the Editorial Team establishes the need of a second assessment round, depending on the evaluators' requirements. If minor revisions are requested, a second round is not necessary and the Editorial Team confirms that the suggestions have been included. If major revisions are requested, the article is sent to a second round of assessment. The editorial team, in both cases, sets a period to receive the corrections of the article. If, after the second round, major revisions are requested again, the article will then be rejected.

The result of the peer assessment, is made clear to the authors, through the sending of the respective assessment guidelines (in anonymous format).

Some data of interest in relation to this evaluation process during 2017 are the following:

1. 34 manuscripts were received from 9 countries.
2. The rejection rate of the articles in 2018 was 30% of the articles received in the first editorial review process, and 15% of the articles received in the peer review process.
3. The panel of evaluators was composed of 74 experts from 10 countries.
4. The average evaluation period per article is 3.8 months.
5. 16 articles were published in the last two numbers.
6. The evaluation guideline is accessible by potential authors.

3. Open access policies

Urbano publishes the Post-Print version of the article in open access format in their institutional archive.
Urban authorizes the authors to disseminate through their personal electronic pages or through any open access repository a copy of the published work, together with which the cited article must be included in its entirety — including year, title full, name of Urbano, number and pages where it was published by adding, in addition, DOI and / or the link to the article on the Urbano website.

4. Data archive

Urbano uses the LOCKSS system to create an archive system distributed between collaborating libraries. This system allows creating permanent files of the journal for conservation and restoration purposes.

Urbano includes the bibliography cited in each article as an exportable field in **Dublin Core format as per the OAI-PMH protocol**.

5. Copyright and licenses

The content of the articles which are published in each edition of Urbano, is the exclusive responsibility of the author(s) and does not necessarily represent the thinking or compromise the opinion of the University of the Bio-Bio.

The author(s) conserve their copyright and guarantee to the journal, the right of first publication of their work, which will simultaneously be subject to the Creative Commons Recognition License CC BY-SA, which allows others to share-copy, transform or create new materials from this work for non-commercial purposes, as long as they recognize authorship and the first publication in this journal, and its new creations are under a license with the same terms.

PUBLICATION ETHICS POLICY

1. Responsibilities and rights of the author(s)

The authors, on sending the manuscript, must send a document where they responsibly declare:

1. That all the author(s) have significantly contributed to the research and/or writing of the article.
2. That the information of the research is original, their own and authentic.
3. That they transfer to Urbano, the rights of public communication of their manuscript for its dissemination and use in the Open Journal System, or any other social network or online portal which the Editorial Team chooses. This is for the online consultation of its content and its abstract, for its printing in paper and/or for its download and archiving, all this under the terms and conditions specified on the platforms where the work is housed.

The author(s), after the rounds of peer evaluator review, must include the suggestions or argue against their rejection, attaching a letter of response to the revisors, explaining the modifications of the manuscript, within the period requested by the editor

The author(s), throughout the editorial process, must include the formal corrections and grounds requested by the Editorial Team.

The author(s), throughout the editorial process, are entitled to withdraw their article from the editorial process, justifying this decision to the Editorial Team.

The author(s), after the style revision process, are entitled to review the last version of the text before it is published. The approval of this version, entails the closing of the text for its diagramming and publication, with no possibility of making changes later.

2. Editorial responsibilities.

The Editorial Team must take into consideration for the publication all the manuscripts sent, basing their decision on their scientific contribution and the compliance of the editorial standards.

The Editorial Team must seek expert evaluators in the specific area of the manuscript, preserving at all times, the anonymity of the author(s) and the evaluator(s) and the academic and scientific nature of the publication.

The Editorial Team must remain in constant contact with the external evaluators and authors, duly clearing up all doubts that arise during the editorial process.

The Editorial Team has the complete authority to accept or reject a manuscript. The reasons why they give this verdict may be the following:

1. If the article does not fit the topic of the call and/or the general approach of Urbano.
2. If the article does not fit the editorial standards and/or the guidelines for authors.
3. If the article does not fit the minimum standards of scientific quality and/or rigor.
4. If the article receives negative evaluations in the peer evaluation rounds.
5. If the article does not incorporate the suggestions of the evaluators or requests of the Editorial Team within the set periods.
6. If the article receives requests for major modifications in the second peer review stage.

The Editorial Team must publish corrections, clarifications, retractions and apologies when so required.

The Editorial Team must not have any conflict of interest regarding the articles sent and must watch that the evaluators do not have any regarding the research they are evaluating. The Editorial Team must guarantee that the articles published in Urbano comply with the ethical criteria for scientific publications established by the Committee on Publication Ethics (COPE) not permitting academic fraud, including fraudulent data or the plagiarism or autoplagiarism of articles which are considered to be relevant parts of the contributions. The detection of these practices will lead to the rejection or immediate withdrawal of the article.

The Editorial Team must aspire to constantly improve and update the journal.

3. Responsibilities of external evaluators.

The evaluators must reject assessments requested by the Editorial Team when they do not have enough competence, experience and knowledge of the specific matter of the manuscript.

The evaluators must report potential conflicts of interest to the editorial team.

The evaluators must make an objective analysis of the manuscripts they are reviewing, giving grounds for their comments and doing this within the period established by the Editorial Team.

The evaluators must maintain the confidentiality of the manuscript during the editorial process with it not being possible to disseminate it or use its content.

The evaluators must keep their relationship with the manuscript confidential.

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Urbano es la revista editada por el Departamento de Planificación y Diseño Urbano de la Universidad del Bío - Bío. Urbano se plantea como una publicación semestral especializada en temas urbanos-territoriales, destinada a explorar la dimensión científica y de investigación que adquiere el estudio de la ciudad y el territorio. Se publica en versión impresa y electrónica, con periodicidad regular y salida en los meses de Mayo y Noviembre. La revisión de artículos es realizada por pares evaluadores externos, de forma anónima
Urbano está destinada a investigadores, profesionales y académicos, y su propósito establecer una visión crítica sobre el fenómeno urbanizador con especial énfasis en la transformación de las ciudades medias y el territorio a escala regional y local. Urbano publica trabajos inéditos y está abierta a la diversidad de enfoques y metodologías, resaltando investigaciones de carácter multidisciplinario e interdisciplinario que permitan visualizar la ciudad y la región desde un contexto amplio y aplicable a la gestión urbana y territorial.

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