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ENVIRONMENTAL MANAGEMENT OF THE SAN ROQUE PERILAGO. CASE STUDY: THE COASTAL BORDER OF VILLA CARLOS PAZ

Mariela Alejandra Frias

Mónica Susana Martínez

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Abstract: The present work is part of the development of the final project on the management of public space on the edge of Lake San Roque- Córdoba- Argentina of the Master in Environmental Management of Urban Development GADU of the Faculty of Architecture, Urbanism and Design FAUD of the National University of Córdoba UNC (graduate student Architect Mariela Frias, directed by Dr. Mónica Martínez). The general objective of this work is to understand the problems of the artificial lakes, as a border zone between the lake area and the urbanized zone, its vocation of great attraction for recreational use and contemplation of the landscape and the environment; to recognize all the actors that participate and their interests in this space as well as the planning, regulation and management instruments available, their scope, opportunities and limitations, in order to elaborate guidelines for sustainable development. In the San Roque reservoir, an artificial lake built at the end of the 19th century and replaced by another one in the first decades of the 20th century as an infrastructure work for the city of Córdoba, the waters of the basins of the San Antonio, Cosquín, Las Mojarras and Los Chorrillos rivers converge. Currently, it is the main water mirror of the Córdoba Metropolitan Region, under the jurisdiction of the provincial government, and surrounded by the municipalities of Villa Carlos Paz, which occupies 47% of the waterfront, in addition to Villa Santa Cruz del Lago, Biale Massé and the municipalities of San Roque and Villa Parque Síquiman. In particular, this presentation addresses the problem of the perilago of the San Roque Reservoir in the section that includes the city of Villa Carlos Paz. The presentation covers the process of occupation and management of the coastal edge of the city of Villa Carlos Paz and its evolution over time. For this purpose, the transformation of this territory and the actors involved in different

stages are studied: a) from the construction of the reservoir of the waters until the 70's where the use as infrastructure and seaside resort predominates; b) the consolidation of the urbanization of the coasts from the 70's until the beginning of the XXI century; c) the first decade of the XXI century that is characterized by the ideation of the project Puerto San Roque 2005-2010 and the conformation of a public-private corporation for its management; d) the second decade of the 21st century, which is characterized by the recovery of part of the waterfront as a public green space, through the creation of the Urban Environmental Planning Council and the adaptation of a participatory management model from 2009 to the present.

Keywords: perilago, Villa Carlos Paz, occupancy, guidelines

INTRODUCTION

A PRIVILEGED TERRITORY

By the 16th century, the territory currently occupied by Lake San Roque was a valley surrounded by rivers and streams, with exceptional conditions for human settlement. The aborigines took advantage of the water courses and their encounters as the most fertile areas for fishing, hunting, fruit gathering and food production.

After the Spanish Conquest (1600), the territory of the valley was organized into encomiendas, and large estancias and chapels were built (from 1668). Cattle raising and the cultivation of corn, potatoes and lime, among others, were incorporated. The first irrigation canals were built (Medina, 2021).

The valley formed by the Sierras Chicas to the east and the Sierras Grandes to the west and the meeting of the San Antonio and Cosquín rivers and the main streams Las Mojarras and Los Chorrillos, with other minor ones, represents at the end of the 19th

century, a strategic place for the development of the water infrastructure works necessary to supply water to the city of Córdoba, capital of the homonymous province, as well as to provide energy sources and irrigation for crops and food production. The territory presents privileged conditions in its physical, hydrographic, and relief characteristics that are highly suitable for the development of the regional infrastructures necessary for the development of this territory.

DEVELOPMENT

LAKE, TRAINS AND FIRST HOUSING DEVELOPMENTS

This first section deals with the construction of the water reservoir until the 1970s, when the lake and perilago were predominantly used as an infrastructure and resort for tourist purposes.

This period is characterized by two important significant events. Two infrastructure works, on the one hand the railway line that accompanies the water courses (Primero and Cosquín) and on the other hand the construction of the San Roque Dam, first built at the end of the XIX century (1891) and second built in the middle of the XX century (1944), which dams the waters of the lake of the same name.

With the construction of the dam and the creation of the lake, the mountain landscape and the environmental conditions of the surroundings changed substantially. The headwaters of the Suquía river, from the union of the tributary rivers and streams, define the location of the reservoir, which is boxed in by the western slope of the Sierras Chicas. The railway line, together with the system of stations, also transforms the territory bordering the reservoir to the north.

At the beginning of the 20th century, the first urbanizations were located on both sides of the banks of the San Antonio River at the

point where it flows into Lake San Roque. 1913 is taken as the year of foundation of the city of Villa Carlos Paz (VCP). A system of bridges progressively integrates the territory (Puente Carena, Puente Negro) and articulates the main roads (national and provincial routes) that border the lake and river courses, the lots and first buildings of Villa La Cuesta (1892), Villa Independencia (1915), Villa Suiza (1915) and Villa del Lago (1921) among others.

Until the mid-twentieth century, the growth of urbanization around the artificial reservoir of San Roque was slow. The use of the coastal edges is as a seaside resort, fishing, nautical sports, among others. Esmeralda Beach, on the western perilago, is one of the characteristic beaches of this period (Figure 2).

The urban development is consolidated towards the middle of the XX century with the development of the 2nd Dam (1944). The San Roque Lake represents the main recreational tourist resource of VCP and its region, the construction of the road bridge, today Uruguay, separated from the central area, extends the occupation of the urbanization on the east and west lake edges. In 1952 VCP was established as a municipality and in 1964 as a city. At the end of this period, in 1972, the layout of the highway was consolidated.

During this period, a set of regulations, provincial laws, were developed to determine the main elevation of the reservoir, and a plan at the municipal level to organize the future growth of the city.

In 1951, Decree N° 20016, Series "C"-, approving Resolution N° 391 of the Director General of Hydraulics, advises the fixing of elevation 38 m. and the expropriation of the land affected by the San Roque Dam reservoir. Almost two decades later, in 1969, the Provincial Directorate of Hydraulics requested, by Resolution No. 1268, to annul the fixing of the 38 m. elevation and the expropriation of the land affected by the San Roque Dam reservoir and to fix instead the 36 m. level line.



Figure 1. Photo of Lake San Roque artificial reservoir, train of the sierras and aerial photo of the city of VCP. Various sources.



Figure 2. Photo of the VCP perillago spas. Various sources.

In the same year, Provincial Decree No. 8178/69 fixed the 36 m. level line as the limit of the land subject to expropriation for the San Roque Dam reservoir, freeing those located above that line. The same Decree prohibits any building between elevations +35 to +36 (Art. 5). It indicates that the owners facing Lake San Roque must: a) *Leave a 15 meter wide strip of green space from the 36 meter level curve.* b) *Refrain from dumping sewage or industrial liquids into the lake without prior purification treatment duly approved by the Provincial Hydraulic Directorate. All the works, subdivisions, constructions, improvements or modifications of the current altimetric plan characteristics, of the lands included between the curves of the 36 and 38 meters must be previously approved by the Provincial Directorate of Hydraulics. To this end, the General Directorate of Cadastre and the Professional Associations and the Municipality of Villa Carlos Paz, shall not proceed with any file related to the lands located between elevations +35 to +38 without the previous intervention and resolution of the Provincial Directorate of Hydraulics, which shall ensure the faithful compliance with these provisions. (Art. 7).*

In 1973, the Water Code Law No. 5589 regulates the natural resource, its domain and classification, its different uses and defense against harmful effects, public and private works for this purpose, as well as matters related to the regime of offenses, jurisdiction and competence, within the framework of the powers arising from the National Constitution and the Provincial Constitution.

At the end of this period, the development of an Urban Development Plan for the city of VCP was managed (Ramos, 1978). The study proposes a scenario of exponential growth that is not compatible with the city's reality.

BETWEEN THE LAKE AND THE MOUNTAINS

In this second section, we study the consolidation of coastal occupation from the late 1970s until the beginning of the 21st century.

During this period there was a significant advance of urbanization on the two most valuable landscape and environmental resources: the occupation advanced both on the slopes of the mountainside and on the edge of the lake: the processes of deforestation, pollution,

desertification, eutrophication, among others, accelerated. During this period there was an important demographic growth, as well as an exponential growth of the tourist offer (hotels, cabins, apartments, among others). The population was 40,692 in 1991 and 54,407 in 2001.

With the advance of urbanization, the plots of land on the shore bordering the lake to the west (Villa del Lago) are occupied with dominant residential use and complementary recreational uses (hotels, bars) and on the east shore (Centro, Villa Domínguez and Santa Rita) with dominant recreational uses, clubs, sports areas, privatizing a large part of the area bordering the urban radius, strongly conditioning public access to the shore. The Artemisi or Portobello tower, on the west coast, is the tallest tower that borders the lake and represents an icon of the real estate development of the moment.

From the 80's onwards, there was a process of mutation and fragmentation of the urban landscape, from a mountain tourist village to an urban tourist village. The downtown area was pedestrianized and new bridges and overpasses were built over the San Antonio River, such as the Cassafouth. The main environmental imbalances are manifested as a result of deforestation, soil sealing, and water pollution from the discharge of sewage. The economic activities grow linked to the recreational tourist offer, lodging, gastronomy, among others.

In this period, from the beginning of a global agenda, a process of regulation and management is developed around environmental issues and participatory urban planning.

During this period, national and provincial environmental problems became more acute. At a global level, the report "Our Common Future" (1987) presents the term "sustainable development" *as the development that allows satisfying the needs of present generations without compromising the possibilities of future generations to satisfy their own needs.*

At the provincial level, Environmental Law No. 7343/85 regulates the guiding principles for the preservation, conservation, defense and improvement of the environment. Annex 1 of the Law establishes that projects subject to mandatory environmental impact assessment (E.I. A) are infrastructure projects (d) Occupation of land, buildings and infrastructure (e) Environmental impact assessment.A) Infrastructure projects (d) *Occupation of perilagos (whatever their magnitude, density or frequency, there must be an ordinance plan), perilago being understood as: the area between the body of water and the expropriation line set by the Provincial Hydraulics Directorate; (e) Land developments and urbanizations, especially in lake and reservoir feeding basins, and in towns with less than 400,000 (four hundred thousand) inhabitants.*

In 1988 the Provincial Council of Environmental Non-Governmental Organizations published "A lake for all" with a diagnosis of the environmental status of San Roque Lake.

In 1989, the San Roque Lake Basin Committee was created by Law N° 7773. In 1993, this law was modified by Law No. 8301. This law establishes the creation of the Committee for the Sustainable Development of the San Roque Lake Basin and the recovery of drinking water for Cordoba, in order to *promote all necessary policies and measures aimed at eliminating all polluting factors affecting the water-courses and lake masses of the basin, which are detrimental to human health and the environment in general, with a view to their progressive and definitive sanitation within the framework of the guiding principles of Law 7343 (Art. 1).* The Committee is composed of representatives of the: *Minister of Public Works and Services; of the Undersecretary of Environment; of the Provincial Directorate of Water and Sanitation; of the Provincial Environmental Council and of the municipalities of La Cumbre, Villa Giardino, Huerta Grande, La Falda, Valle Her-*

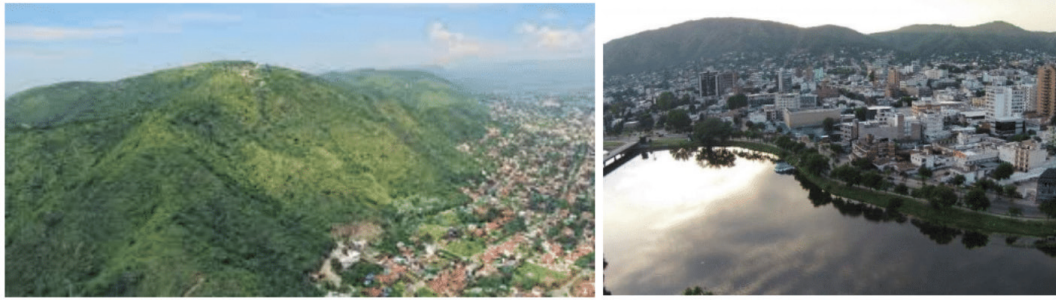


Figure 3. Progress of urbanization on the hillside and coast. Source: Municipality of Villa Carlos Paz. Various sources.

*moso, Cosquín, Santa María de Punilla, Bialet Massé, Tanti, Villa Carlos Paz, La Calera, Villa Allende, Saldán, Córdoba.*¹

In 1999, the Provincial Government launched the Environmental Institutional Development Program (Programa de Desarrollo Institucional Ambiental, PRODIA). PRODIA, with the objective of creating the Intermunicipal-Communal Entity for the Environmental Management of the San Roque Lake Basin (E.I.M.A.C. - Lago San Roque) by summoning the authorities of the Municipalities and Communes of the Basin. All these efforts have not borne fruit, partly due to lack of political commitment and continuity.

In line with the environmental policies at provincial level, in 1986 the municipality regulates the Ordinance N°1625 that declares of public interest, for the purpose of its maintenance, defense and improvement, all urban, agricultural and natural environments, with all their constituent elements that, due to the value they contain or *represent, are suitable to stimulate the national, provincial and communal wealth in order to culture, science, technology, recreation and particularly for the benefit of the best quality of life within the Municipal District of the City of Villa Carlos Paz.* (Art.1)

In 1989, the municipality adhered by Ordinance N° 1924/ to Law N° 7773 for the creation of the Lake San Roque Basin Committee. Within the framework of the Basin Committee, the Ministry of Public Works and Services published in 1991 the pilot study for Villa Carlos Paz - Diagnosis, actions and criteria for regulatory intervention. A team led by Architect Maria Elena Foglia developed the pilot plan for the future land use planning of the urban centers of the Basin, which concluded with a proposal for the regulation of occupation by type zones, according to the relief and slopes (1989-1991), exemplified for VCP, but transferable to all the municipalities of the valley.

In 1998, the Plan de la Villa was launched, the first participatory planning process carried out in the City of Villa Carlos Paz. On the occasion, the institutions that make up the Validation Board approve the portfolio of projects emerging from the process of elaboration of the Plan, which is developed over a year and in which more than 300 neighbors participate. Among the projects in the plan are the sanctioning of the organic charter, the creation of a participatory urban planning council and the creation of a lakeshore promenade. The plan establishes the general criteria for ordering future development and recognizes the value of the lake and the sierras in the identity of the territory.

1. The committee's internal regulations determine the incorporation of the municipalities, as well as other municipalities that may be related to the basin (Art. 2).

THE SAN ROQUE PORT PROJECT

This third stage, which includes the first decade of the 21st century, is strongly marked by the growing environmental problems and the creation of the public-private corporation for the development of the Puerto San Roque project on the eastern edge of the perilago.

This period is characterized by the explosion of urban real estate growth. After the 2001 crisis, the city became a scenario for investment and capital protection. The urban fabric is consolidated and densified, together with the extension of growth in its metropolitan area and the development of nearby municipalities and communes, including those bordering the lake, especially Villa Santa Cruz del Lago, Villa Parque Siquiman, Biale Massé and San Roque.

The lake and mountain scenery continues to be the main attraction of this period, increasingly exposing its environmental vulnerability. Urbanization is advancing along the edge of the streams, rivers and reservoir, privatizing and definitively conditioning accessibility to a large part of the margins. The patterns of tower occupancy and collective housing go hand in hand with a process of strong real estate speculation, which also manifests itself in the demolition and replacement of the first buildings, and the consequent loss of their heritage value.

During this period, the expropriation and regularization of the coastal occupation of the perilago in the eastward polygon defined between the coast (W) and Illia Avenue (E) and between Nahuel Huapi (N) and Güemes (S) is managed and the development of a strategic project Puerto San Roque of mixed public-private management is promoted. The development of different project alternatives, with a mixed program of private and other collective uses on the coastline, is being commissioned.

2. The project foresees the urbanization of the waterfront with the incorporation of recreational, sports and cultural uses, as well as a gated residential neighborhood.

During this period, the municipality managed the purchase of part of the land belonging to the Ministry of Defense of the Third Army Corps between the highway and the Costa Azul bypass, where one of the most important infrastructure works was managed, such as the sewage treatment plant that replaces the first treatment plant in the center of the city (2004).

In this decade, a strong dynamic for the management and planning of the provincial and metropolitan territory took place at the provincial level.

In 2004, Law No. 9206 on the Regionalization of the Province of Córdoba was passed, which established the Punilla Regional Community. The Law grants the community the Police Power over the areas of the provincial territory. Among the functions is *the planning and generation of the development of the Region, the execution of plans and projects to that effect, the control of the territory, the control of the maintenance of communication routes, the control of water management, the control of environmental protection, the execution of works and the provision of services that transcend the municipal or communal radius and affect or interest the Region or an area of it* (Art. 10). The municipality of VCP does not participate by political decision of the Regional Community.

Also in 1994, the “*Corporación Nuevo Puerto San Roque Sociedad Anónima*” was created by Law 9.193, to *plan, project and execute, by itself or through third parties, the urban development and exploitation of the area “Lago San Roque”, in accordance with the municipal regulations and the provincial and national legislation (art.2)² formed by the Executive Power of the Province of Córdoba and the Municipality of the city of Villa Carlos Paz (art.1).*) The urban development area located in the East Sector of the Peri lake of Lake San

Roque, is limited to the North by elevation 33, to the South by Avenida Costanera - Avenida Atlántica -, to the West by Calle Güemes, to the East by Calle Nahuel Huapi, with an approximate area of three hundred and eighty eight thousand (338.00) square meters.

In 2009, Law No. 9544 created the Metropolitan Area Planning Institute (IPLAM) within the scope of the Government of the Province of Córdoba. Villa Carlos Paz is part of the Córdoba-Capital Metropolitan Region. The IPLAM determines a series of uses for the edge of the perilago defined by Law No. 10004/11 Metropolitan Land Use Plan, second ring. Uses on the San Roque perilago are regulated as: consolidated urbanized area (orange), priority urbanization area (red), deferred urbanization area (pink), natural protected area (dark green), area of strategic value (light blue). The municipality of VCP does not adhere to this law. On the other hand, Law 9687/10 Master Road Plan for the Córdoba Metropolitan Region, in the second ring, configures the NE limit of the perilago.

In 2010, Law No. 9867 created the Provincial Administration of Water Resources (APRHI), which is an autarkic agency, with legal personality under the public law of the Provincial State and the capacity to act publicly and privately, with financial individuality and its own patrimony.

At the municipal level, in 2004, Ordinance No. 4393 of the Municipality of Villa Carlos Paz adhered to Provincial Law No. 9193/04 for the creation of the Puerto San Roque Corporation. This planning and management policy will be revised in the following decade.

Around 2006, a first study was carried out for the revision of the Urban Code. María Elena Foglia adopts the environmental approach, already developed within the framework of the actions of the Basin Committee in the period 1989-1991.

In 2008, the Municipal Charter of Villa Carlos Paz (COM) was approved, thus fulfilling one of the central axes of the Villa's Plan. One of the most important projects of the folder was the approval of the Municipal Charter.

This COM establishes in its Art.14 *The Municipality of Villa Carlos Paz, a mountain tourist city, declares that the slopes of the mountain ranges, the native forests, the lake shores, including its water mirror and the rivers that cross it, constitute its natural and tourist resources and must be protected by ordinances and by agreements with Municipalities or Communes, Province and Nation. The Municipality has the obligation to protect the environment of the basin and slopes of the mountain ranges and not to cause or prevent any significant damage to its waters, bed, subsoil and the flora and fauna that inhabit them.*

The Urban Code N° 4021 Art. 2.3.3.6 regulates both banks of rivers, streams and Lake San Roque, with an avenue of thirty (30) meters wide, whose location with respect to the river and/or lake shore line will be determined in each particular case by the corresponding technical office.

In 2008, the Urban Environmental Planning Council (CPUA) was created by Ordinance No. 4951. It became operational in March 2009. The process of city planning and the creation of the CPUA takes on an institutional character through the Organic Charter (Art. 79).

In 2010, it is adhered by Ordinance No. 3683/10 to the Agreement Decree No. 518/2000 signed with the Government of the Province of Cordoba, and the Municipality of Villa Carlos Paz, for the Surveillance of Lake San Roque and its shores and tributaries within the Municipal Area. (Art. 1). By means of this the province entrusts and the municipality accepts the surveillance of San Roque Lake, its shores and its tributaries within the Mu-

nicipal Area, in relation to compliance with the Water Code of the Province and the Nautical Law. The Municipality carries out a legal and technical survey of the occupants and/or owners of the land adjacent to the lake, in order to regularize the situation if necessary of each of them (Decree No. 518/2000 Clause Four).

THE PASEO DE LA COSTA AND THE PROTECTED AREA NORTE OR LOS MIMBRES

This fourth stage comprises the beginning of the second decade of the 21st century up to the present. This period represents a change in the city's environmental policy. One of the fundamental projects is the recovery of a large part of the east coast of the perliago for the use of public green space, turning the sector into a large urban park.

The "Puerto San Roque" project, developed in the previous decade, was rejected by a large part of the VCP society, which considered it as an instance of privatization of the coast. Having aborted the continuity of the development of the project³, this stretch of the coastal border "Paseo de la Costa" is recovered for public use, which becomes the main public space and tourist attraction of the city. The vehicular coastal street planned by the project is transformed into a pedestrian and bicycle street. The Illia Corridor is consolidated, delimiting the public area of the urbanization of the east coast, organizing economic activities on one side, keeping the rest green, with recreational, sports and cultural activities of a predominantly public nature.

Among the actions that determine a change in the process of growth of the city and the generation of social awareness of environmental problems is the delimitation of growth on the mountainous edge of the Sierras Chicas, and the declaration of the

protected area Camiare Norte and Sur on the western slope of the mountains, as well as the prohibition of high-rise buildings, which obstruct the view of the sierras.

The participatory management carried out by the Environmental Urban Planning Council (CPUA, a body created by the Organic Charter) is fundamental in the definition of these policies, which, as a non-binding body, prepares opinions in the form of recommendations to the Council of Representatives for their regulation.

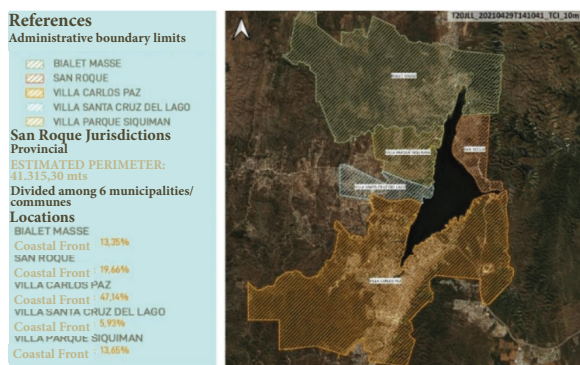


Figure 6: Municipalities that make up the edge of the San Roque Reservoir perliago.

Source: Environment Directorate. MVCP.

During this period, both at the provincial and municipal levels, land planning and regulation with an environmental focus was consolidated.

In 2010, Law No. 9867 created the Provincial Administration of Water Resources (APRHI), which is an autarkic agency, with legal personality under the public law of the Provincial State and the capacity to act publicly and privately, financial individuality and its own assets.

In 2014, Law No. 10,208 was passed, which determines the provincial environmental policy in exercise of the powers established in Article 41 of the National Constitution, complements the minimum requirements established in National Law No. 25,675 - General Environ-

3. With the change of government

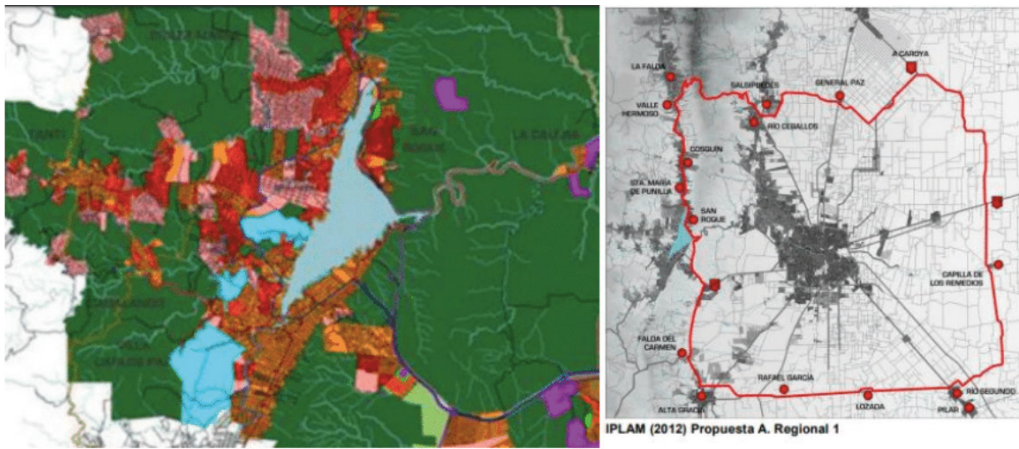


Figure 4. Use Plan for the IPLAM perilago. Proposed 2nd Ring Road.
Source. IPLAM.

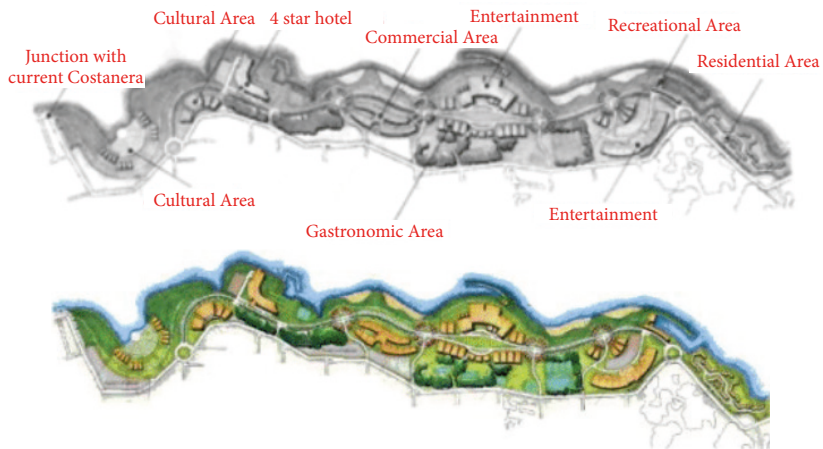


Figure 5. Lake San Roque Shoreline Project. Alternative project commissioning. Various sources.

mental Law -, for the sustainable and adequate management of the environment, the preservation and protection of biological diversity and the implementation of sustainable development that promotes an adequate coexistence of the inhabitants with their environment in the territory of the Province of Córdoba (Art. 1).

In 2016, Law No. 10355 declares of public interest the environmental protection and the optimal, responsible and rational use, pursuant to Articles 240 and 1970 of the National Civil and Commercial Code, of the physical space or strip of land adjacent to any watercourse, starting from the bank line in question and extending up to thirty-five meters counted from that base. (Art. 1) The purpose of the restriction to the domain is to safeguard the ecological balance of the areas and environments referred to, without intending to share or impair the right of ownership or possession in question. (Art. 2) *In the case of watercourses that cross a municipal or communal radius, the local authorities may not dictate any rule that alters or relativizes the restriction to the domain established by the present legal body.* (Art. 3)

In 2015, Ordinance No. 6010 declares the intangibility of the mountain range through the management of the CPUA. In 2018, by Ordinance No. 6403 approves the modification of the Municipal Radius of the City of Villa Carlos Paz, in accordance with the provisions of Article 7° of the Municipal Organic Law No. 8102 total area of the Municipal radius De Villa Carlos Paz 8293 ha 9723 m² (eight thousand two hundred ninety-three hectares nine thousand seven hundred twenty-three square meters).

At the municipal level, in 2016, the municipal legislature is moving forward in the management of a new Urban Plan 2020 that commissions a team of external professionals. In the vision of the urban environmental axis, with the participation of the CPUA, *Villa Carlos Paz is proposed, an orderly, healthy, dynamic, equitable, innovative, environmentally sustainable and protected city...* One of the pro-

jects of this axis is the realization of the clean water reservoir generated by the construction of a dam between East and West waterfronts at the mouth of the San Antonio River to the lake. Another of the projects ratifies the Urban Park Paseo de la Costa del Lago San Roque.

In 2018, the territories annexed by Provincial Law No. 10,595 to the pre-existing ejido of the City of Villa Carlos Paz, and which reach the polygonal area between the line that delimits the new ejido of the City with that which delimited the one approved by Decree Law No. 2650/75, were incorporated. Until 2018, year in which it is approved and incorporated to the new municipal radius of Villa Carlos Paz, the territories of the perilago Playa Los Mimbres sector and the Camino a las 100 curvas were provincial territory. Its incorporation to the municipal radius triples the area from 2703 to 8293 hectares approximately.

For the planning of the new territory, the Council of Representatives, through the CPUA, commissioned a geomorphological study to the National Water Institute, Semiarid Region Center (INA- CIRSA). Through this study, the system of tributary streams of the main rivers is completed to the geography of the municipal territory. With the extension of the radius, the entire edge of the perilago is under the administration of a municipality or commune.

In 2019, the Directorate of Environment is created within the municipal scope of Villa Carlos Paz, which consolidates the issues addressed before integrated to the Directorate of Environmental Urban Planning (2011-2019).

In 2020, and as part of the new municipal radius, the North Protected Area was approved, in the strip delimited by the old town of Villa Carlos Paz, and the Santa Cruz de Lago Commune, which contains the basin of the Los Mimbres stream that drains into the reservoir, bordering the lake edge in the area of the bay of the same name (private property).

In 2020, the comprehensive study for the planning of the new Ejido of Villa Carlos Paz

is approved. The Study of the Geological, Geomorphological and Biotic Environment of the land to be annexed for the expansion of the ejido of the city of Villa Carlos Paz coordinated by Geol. Osvaldo Barbeito (CIRSA), contemplates the following dimensions: geological, geomorphological, relief, hydrogeomorphological, edaphological, biotic environment, plant communities, danger, frequency - risk of fires and pre-Hispanic archaeological sites in the radius of the town of Villa Carlos Paz. The objective is to have basic information that will make it possible to establish sustainable planning and guarantee the orderly growth of the new municipal area. Ordinance No. 6637/20 approves this study as the first stage of the Urban Environmental Development Plan.

REFLECTIONS

This paper aims to demonstrate the impact of management processes in the case of an aquifer edge and its implications from a sustainability approach. The study of the problem of the perilago in the coastal edge of the city of VCP is not exempt from the general urban, provincial and national problems.

Historically, there has been a growing policy of loss of reservoir capacity, with the reservoir height dropping from 38 to 36 m. The San Roque Port project foresees a shoreline at the 33 m line, which would significantly reduce the amount of water in the reservoir.

At the provincial level, the management of a Land Management Law, which establishes the general guidelines for the management of special areas (perilagos, among others) and defines the conditions of occupation of the coastal edges, is essential to maintain the quality of the natural environments (lake, perilago, among others).

Law No. 10355/16 on the environmental quality of the edges of watercourses, as well as

4. *The Civil and Commercial Code of the Nation, under the title, limits to the domain, Article No. 1974, prescribes punctually on the towpath: "Towpath. The owner of a property adjoining any of the banks of watercourses or their banks, suitable for water transportation, must leave free a strip of land fifteen meters wide along the entire length of the course, in which he may not do any act that impairs that activity.* Source: Guide for the elaboration (2019).

the provision of towpaths⁴, constitute guidelines for special zoning of these edges, preserving their quality as biological corridors, reliquaries of biodiversity, of incalculable value for the improvement of environmental quality.

In the territory of the VCP perilago, three clearly defined situations can be observed: a) dominance of public green space or recently created collective use facilities: in these spaces it is possible to access the coast and contemplate the panoramic views of the landscape, representing approximately 15% of the land; b) dominance of individual and collective residential use and complementary recreational facilities: with privatization of the edge; spaces without public access or with difficulty of public access, represent approximately 60% of the land; c) unoccupied spaces of natural characteristics of private property (National Army or private), represent about 25%, with dominant native vegetation.

At time 0, the relationship between man and nature is perceived as harmonious in the minimal intervention on the ecosystem with slight modifications. This is the moment of the Comechingones native peoples.

At time 1 with the construction of the dam wall, the increase in the flow of stored water and the use of the new recreational beaches of the water mirror. The terrestrial ecosystems are transformed into aquatic and transitional ecosystems. The intervention is strong and the use of the space in harmony with the natural environment is similar. Moment Estancia Santa Leocadia.

At Moment 2, the settlement of private activities such as campgrounds, clubs and others on the lake shore, gradually denying access to public space, represents the privatization of the use of the shores in a large part of its course. The link between nature and society ceases to be harmonious and is taken as private

property with little valuation of the ecosystem and increasing pollution levels. Moment City Villa Carlos Paz decade of the 90's.

At the time 3 the withdrawal of private uses in a sector of the east coast, subsequent filling of the land to elevation 36 and then presentation of urban development projects to privatize it again. The west coast continues to be occupied by private residential property for the most part without this situation being modified. Here we see an achievement and the potential for its immediate loss. Momentum New San Roque Port Law 2000-2010.

At Moment 4, once the intention of privatizing the coasts by denying access to their public use has been discarded, their use is regulated by means of zoning through the participative intervention of diverse actors represented in institutions and organizations. Valuation of the natural heritage of the ecosystem in interaction with society. Declared an Area of Environmental Interest. CPAA 2012-2024 moment.

The observation of these 4 moments with their intermediate processes shows the movement in the changes of land use and the impact on the lake shore ecosystem. The decisions of the actors at each moment and their environmental repercussions, in a maturation and awareness of environmental care. The AIAs (areas of environmental interest) declared by participatory management processes and legitimized by municipal regulations (public instruments) promote a path to follow in this direction. The declarations of Laguna de Mar Chiquita National Park and the protected area of the lake border of Lake Los Molinos in the Villa Ciudad Parque Commune are two good precedents that guide the course of action of public policies for sustainability.

The recent declarations of Mar Chiquita Lagoon as a National Park and of Lake Los Molinos in the Villa Ciudad Parque Commune as a protected area are two good precedents that guide the course of action of public policies for sustainability.

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