

Naturalización de ciudades: estudio de la Repercusión de Conflictos Bélicos en el desarrollo del Verde Urbano

Naturalization of cities: study of the Impact of War Conflicts on the development of Urban Green

Cidades de naturalização: estudo sobre o impacto dos conflitos armados sobre Desenvolvimento Urbano Verde

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Resumen

Un conflicto bélico supone pérdidas y cambios. El Verde Urbano, como uno de los bienes más preciados en una ciudad, casi siempre es muy afectado en una contienda. El propósito de esta investigación fue analizar la repercusión que tuvieron las guerras en la historia del Verde Urbano de la ciudad en la primera mitad del siglo XX. El trabajo se realizó estudiando el caso puntual de la ciudad de Tarija, Bolivia, aplicando la metodología de análisis histórico-lógico, recolectando datos de bibliotecas, archivos europeos y latinoamericanos, y contemplando los marcos: histórico, legislativo, planes y proyectos.

Para la ejecución de la investigación se diseñaron cuatro fases: recopilación y análisis de la información referente a la evolución y el tratamiento del Verde Urbano en ciudades sostenibles del mundo; recopilación y análisis de la información referente a las Guerras del Pacífico y la del Chaco, y la gestión de las superficies verdes urbanas de la ciudad de Tarija; contraposición e interpretación integral, analítica, sistémica y holística de la relevancia de la información recopilada en la fase uno en relación a la fase dos; y por último, diagnóstico y evaluación del grado de impacto que tuvieron las guerras sufridas en la historia del Verde

Urbano de la ciudad. Los resultados indicaron que en las últimas décadas del siglo XIX y las cinco primeras décadas del siglo XX, se produjeron las pérdidas más significativas de superficies naturalizadas en la ciudad de Tarija. Se discute el hecho de que no se pudo resarcir el daño al Verde Urbano hasta la actualidad y la implicación que éstos indicadores puedan tener en un futuro próximo para la naturalización de la ciudad.

Palabras clave: naturalización de la ciudad, huertos urbanos, gestión ambiental del territorio, especies nativas.

Abstract

A war conflict involves losses and changes. Urban green, as one of the most precious goods in a city, is almost always affected in a contest. The purpose of this research is to analyze the impact of wars on the history of the urban green of the city in the first half of the twentieth century. The work was carried out by studying the specific case of the city of Tarija, Bolivia, applying the methodology of historical-logical analysis, collecting data from European and Latin American libraries and archives and contemplating the frames: historical, legislative, plans and projects.

For the execution of the research four phases were designed: compilation and analysis of the information regarding the evolution and treatment of urban green in sustainable cities of the world; Compilation and analysis of information relating to the Pacific and Chaco Wars and management of urban green areas in the city of Tarija; Analysis and analysis of the relevance of the information collected in phase one in relation to phase two and finally, diagnosis and evaluation of the degree of impact of the wars suffered in the history of the urban green of the city. The results indicate that in the last decades of the nineteenth century and the first five decades of the twentieth century there were the most significant losses of naturalized surfaces in the city of Tarija. It is discussed the fact that it was not possible to compensate the damage to the urban green until the present time and the implication that these indicators can have in the near future for the naturalization of the city.

Key words: naturalization of the city, urban orchards, environmental management of the territory, native species.

Resumo

Uma guerra implica perdas e mudanças. Verde urbano como um dos bens mais valiosos em uma cidade, é quase sempre afetada em um concurso. O objetivo desta pesquisa foi analisar o impacto teve guerras na história da Urban Green City na primeira metade do século XX. O trabalho foi feito através do estudo do caso específico da cidade de Tarija, Bolívia, aplicando a metodologia de análise histórica e lógica, coletando dados de bibliotecas, arquivos europeus e latino-americanos, e contemplando quadros: histórico, legislação, planos e projetos.

Para a execução dos trabalhos de investigação quatro fases: coleta e análise de informações sobre a evolução e tratamento de cidades sustentáveis verde urbana do mundo; coleta e análise de informações sobre a Guerra do Pacífico e do Chaco, e gestão de áreas verdes urbanas da cidade de Tarija; oposta e interpretação integrante, analítica, sistêmica e global da relevância das informações recolhidas na fase um em relação à fase dois; e, finalmente, o diagnóstico e avaliação do grau de impacto que tinha sofrido guerras na história do Green City Urban. Os resultados indicaram que, nas últimas décadas do século XIX e as primeiras cinco décadas do século XX, as perdas superfícies mais significativos naturalizados na cidade de Tarija ocorreu. que não poderiam compensar os danos ao Urban Verde até agora e a implicação de que esses indicadores podem estar perto para o futuro naturalização da cidade é discutida.

Palavras-chave: cidade naturalização, jardins urbanos, manejo da terra ambiental, espécies nativas.

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Introduction

Towards the end of the eighteenth century, the great technological and social transformation that would change Europe, and also the world at large, began. The Industrial Revolution, which reached its apogee at the beginning of the 19th century, transformed the cities from small settlements with spacious dwellings that allowed soft interior areas to dense cities that sheltered 29.8% of the world's population and where it was gradually more difficult to experience Green spaces (Roca, 2005, p.21). In the early years of the 20th century, the philosophy and policy of making the city changed, the first hygienist reforms emerged, the concept of subsidized housing constructions, the introduction of transport systems for people and goods through railway lines and streetcars in cities (López de Lucio, 1993, pp. 37-42) and above all changed the concept of what was a green area, giving way to the idea of a city with less spontaneous urban nature and more artificially organized landscaping (Hough 1998, Pp. 7-10).

Urban agricultural practices were also part of the Urban Green, orchards and orchard gardens were often seen in cities. The greatest amount of data on these practices are related to periods of food shortages, as in the case of home gardens in Detroit, USA, during the Depression of 1893-1897, American relief gardens in the Great Depression of 1929 -1935, the American Liberty and Victory Gardens program at the time of the two post World Wars, cottage garden in the United Kingdom and many European cities during the First and Second World Wars, the German Schrebergärten at the beginning of the 20th century, the first initiatives For the creation of family orchards during the Franco dictatorship in Spain and also the plots of fifths and family orchards in Argentina (Zaar, 2011, p.12).

The characteristics of North American and some European cities in the early twentieth century were basically defined by the concept of low-density green peripheral suburbs, structured under the idea of garden cities of discontinuous and homogeneous growth characters with a much more fragmented social life And spatially differentiated (Barreto, 2011, p.3, Hough, 1998, p.3 and Falcón, 2007, p.11). Likewise, the reality differed in those Latin American republics recently formed, since the warlike conflicts for the sovereignty of

the territories remained common. Colombian, Venezuelan, Bolivian, etc., born under the colonial design, with large urban gardens and ornamental vegetation in many of its streets, saw a serious loss of Urban Green after the wars (Koroliyov y Kudachkin, 1997, p. 78-80).

The Bolivian Republic, which at the beginning of the twentieth century had 2.5 million inhabitants and a predominantly rural population, fought in less than fifty years two wars that inexorably determined its fate, the Pacific War that happened in the late nineteenth century (1879-1883) And stripped the Bolivian territory of its entire coastline and its natural wealth, and the Chaco War (1932-1935) that erupted when the country attempted to restructure after the First World War and the Great Depression, in this conflagration Nation lost much of its Chaco Boreal (Mesa, et al., 2014, pp. 467-468 and Tarija Departmental Historical Archive, 2012, p.29).

One of the Bolivian cities that suffered the most from these disputes was the southern department of Tarija, which, after the Chaco War, went from being one of the largest and most urbanized territories to one of the smallest, Higher solar dissections and high percentages of soil erosion (Villegas, 2016, pp. 23-29).

The objective of this research is to analyze the impact of the War of the Pacific (1879-1883) and the Chaco War (1932-1935) on the history of the Urban Green of the city of Tarija, Bolivia. The aim is to analyze holistically, systemically and integrally the treatment and the transformations of urban green surfaces, in order to understand the reality that we are experiencing today, the same one that is believed to be a direct result of the warlike conflicts of the past.

Historical Background

Urban nature in the city

Until the early twentieth century, the department of Tarija was a valley of fertile land, with lush vegetation, mighty rivers and temperate climate (Mingo de la Concepción, 2013, pp. 53-72); Its capital, having 184.7 ha of extension and a population of little more than 12,000 inhabitants (Historic Archive of Tarija, 2012, page 45), was a small city with large single-floor houses with two or three courtyards, composed of extensive Orchards that occupied almost half of the land surface (Arce, 1990, pp. 5-14).

An average apple tree (100 mx 100 m) in the city of Tarija had approximately 48% of its area destined for the patios and the orchard, and considering that at the beginning of the 20th century it only consisted of two private dwellings (Morales 1997, Pp. 35-38), meant that approximately 2000 m² were used exclusively for each particular orchard. In this considerably extensive area, different plant species were used for family consumption, such as all kinds of legumes, tubers, vegetables, various edible fruits and even grasses typical of the region (Wheat 1991, 27-31) , In essence the city of Tarija practiced what is now called urban agriculture (Arosemena, 2012, p.16).

In the same way, numerous fruit trees were planted, such as the inevitable grapevines, which, besides offering fruits for consumption, guaranteed shade, oxygenation of the air and stabilization of temperature, among other benefits (Wheat O` Connor, 1995, pp. 156-179).

The latrines were in common use in Tarija those years, since the public sewer system was still a project for the city. They were always placed in the orchards of the houses, they were dimensioned according to the number of members of the family and when reaching the limit of their capacity were compacted and closed always planting on top any type of vegetation of inedible fruit (Ávila, 2013, p. 161-164).

Together with all this plant diversity, tarijeñas gardens reserved their most remote areas for the breeding of some types of animals for their own consumption, such as pigs, chickens, even sheep and goats, they were fed with the organic wastes produced each day By the family (Morales 1997: 36). In addition to guaranteeing the closure of the solids cycle and producing organic fertilizers of high quality, in environmental terms the gardens were large urban sectors, scattered throughout the capital generating "green holes" in the middle of hard surfaces, the equivalent To connectors that naturalized the urban set through the micro-systems that were created with the great diversity of life that could be accommodated inside.

Although at the beginning of the twentieth century the city of Tarija had an incipient amount of surface destined for public green areas that scarcely added between its 3 squares, 2 parks and 3 squares 4% of the urban surface, nevertheless had 79.42 ha of soft surface , Corresponding only to the urban gardens. These were areas with intense exchanges of energy, matter and information (Seoáñez, 2001, p.23) capable of enriching the city with natural and biodiverse biological processes, thanks to the existence of native plant and animal species, and the inexistence of treatments Biocides and phytocides in their growth (Report on sustainable European cities, 1998, pp. 34-57).

Inside, the apple trees overflowed with greenery; on the outside the streets also received varied low vegetation, either in the middle of the sidewalks that allowed their existence or in small pots that decorated the houses (Arce, 1990, p.16). The photographic archives that still can be consulted of Tarija of old, account of a very different urban physiognomy to the present one. The interstices of Verde Urbano in the middle of red roofs characterized the city, and also created small green corridors very well used by insects, small rodents and above all by the more than 200 species of birds that had like passage the lands of the south in its Annual migration (Villegas, 2016, p. 87-89).

Undoubtedly, two events marked a before and after for the process of naturalization that the city of Tarija was living, were the War of the Pacific (1879-1883) and then the Chaco War (1932-1935). Although these conflagrations were fought in regions distant to the capital, this one suffered gravely by his cause. Until the end of the 19th century, the city of Tarija only

counted with the Plaza de Armas or Central Plaza as the only green area, after the War of the Pacific is closed to the public. The passage of the Chaco War in the thirties of the twentieth century was devastating, as the city went from having several green areas with exuberant vegetation, to having lots devoid of all tapistical form (Tarija Departmental Historical Archives, p. -101).

As reported by Perez (2015) the mounds used in the Chaco race outlined new roads in the city, the central square, closed with high fences up to these years, was first opened for motorcycles, thus losing all vegetation cover . But most unfortunate was to lose years later more than 50 orange trees of the same (Wheat, O'Connor, 1995, p.160), which had suffered damage in the war years, and in the new Departmental Reforestation Plan were Changed by tall strange palm trees to these latitudes (Paz G., 2011, p. 69-78).

Interconnection between urban and rural environments

More than 300 years after its founding, the city of Tarija was a small and peaceful city where the connective processes between society and ecology reigned (Pérez, 2015, pp. 45-53), and where the compactness of human settlements made the Pedestrian relationships in a friendly city made up of green circuit networks.

It was clearly perceptible an intrinsic relationship between nature and city, where in a symbiotic way green was a vital part of the conglomerate, its culture and its life psychology. In the early years of the twentieth century, Tarija was one of the smallest and least populated cities in the country (Tarija Departmental Historic Archive, 2012, pp. 29-42), but it was rich in urban nature and biological processes inside and outside (Henares, 1937, p.2, Quiroga, 1938, p.1, Trigo, 1931, p.6 and Piccardo, 1930, p.2).

Since its founding in 1574, the city has been operating in direct connection with its natural boundaries (O'Connor d'Arlach, 1929, p.3). For hundreds of years a "network of friendly green circuits" functioned by naturalizing the city and taking advantage of natural water courses, wind currents and urban tree masses. The main river and its banks were ecological corridors that served efficiently for the displacement of birds and insects that crossed to the two green belts that walled the city in the northeast and southeast, thus, in the middle were spread many "green holes", the Urban gardens, which were used for passage nests or resting

places for small animals, birds and insects. The combination of all these natural processes occurred "with" and "in" the city, connecting it with the rural world and naturalizing it.

The city was mixed in a balanced way with the non-urbanized areas, integrating the urban and rural, being a small city, it was easy to travel walking or cycling, and it was also very common to enjoy the nearby tributaries, aspects Which developed in the Tarijeño a strong feeling of topofilia and biofilia (Yory, 1998, pp. 2-8, Wilson, 2003, p.20 and Sánchez y De la Garza, 2015, p.9).

The urban man lived with the urban and rural nature propitiating a delicate balance, the socio-environmental culture of the population was undoubtedly greater than it is currently. It can be said that the tarijeño understood that his quality of life was in direct relation with its green spaces, and that these go beyond the biological and physical considerations, and even influence in social, economic and environmental areas (Consejería de Medio Ambiente. Junta de Andalucía, 2009, p. 12-35).

Relationship between architecture and environment

The constructive systems of the first Bolivian settlers evidenced building typologies conceived according to site conditions and the sociocultural needs of human settlements (Gisbert T., 1998, pp. 85-88), this type of popular architecture is a perfect match between the Climate and sustainable construction (Neila, 2010, p.13). The colonizers in the town of Tarija appropriated many constructive ideas by the natives (Bass Werner, Angelis and Juline, 1997, p.88 and Calzavarini, 20061, pp. 8 and 9), who Took advantage of geographical conditions and designed the city by considering the advantages of a biomimetic architecture (Benyus, 2012, pp. 15-26).

In a temperate city where high-rise houses with one or two floors were built, with thick adobe or brick walls with handmade tiles, it was very common to find large private dwellings with up to three vast patios always filled with interior vegetation, and Around which the rooms were distributed, which were heated by being built with earth (López, 1926, pp. 92-99, Aguirre, 1997, pp. 162-164 and Navajas, 1925, p.90).

The relationship that existed between nature and urbanite began in the interior of each house. With such a low population density, it was possible to enjoy much space to distribute a house with central patios full of plant and animal species, which meant extending nature within bioclimatic architecture (Neila, 2010, p.12).

There was so much integration between nature and urbanity, as a kind of biomimesis, that aerial plants could be seen growing on tarijeños roofs, and at the same time, it was common to observe nesting various species of birds in them (Arce, 1990, p. 10-13).

Until the late 19th century, Tarija architecture was exclusively erected with materials from the site and its surroundings (Gutiérrez, 1919, pp. 14-18). After the War of the Pacific (1879-1883), Tarija became the largest commercial center in the south of the country, which generated a great economic movement and, thanks to it, began to change the construction paradigms, incorporating novel materials and modern ideas (Estenssoro , 1922, pp. 77-83) but leaving aside that "society" between nature and architecture (Pauli, 2011, p.24) that worked effectively for hundreds of years.

After the Chaco War, the urban physiognomy of Tarija began to change, a serious economic and social crisis hit the country, this forced the owners to sell a large part of their homes leaving them deprived of their patios and orchards (Trigo O'Connor , 1995, pp. 158 and 159). Instead, new constructions began to be constructed, replacing the innocuous and eco-efficient materials of yesteryear with modern and inefficient ones (Arce, 1990, pp. 6-11), such as metal roofing plates called calamines, industrial bricks replacing Thick adobe walls or latex paints, filled with the controversial chemical compounds known as phthalates (Goleman, 2010, p.184) instead of handmade preparations based on natural pigments. In 1942 the first General Building Regulations of the City of Tarija was published until 1975, which completely lacks aspects that regulate Urban Green and vernacular architecture (Comisión de Obras Públicas Municipales de la Ciudad de Tarija, 1942, p. 3-50).

Plant species of the city

The first stories that describe Tarija show it as a fertile valley, with a mild climate, with varied vegetation characterized by woody plants, tubers or vegetal forms of tapestry typical of valleys of temperate climate; Also abundant animal species such as carnivorous, herbivorous and ruminant mammals, so the valley also enjoyed mighty rivers of crystalline waters (Barragan, 2001, p.5). So fruitful were the tarijeñas lands that for many years produced the grains for the sustenance of Potosí (P. Corrado and P. Comajuncosa, 1990, pp. 507 and 508).

The excellent characteristics of the tarijeños soils made this valley the perfect territory for the introduction of new plant and animal species since its foundation (Bass Werner, et al., 1997, pp. 25-41); By the middle of the nineteenth century the few urban green areas and extensive private gardens overflowed with foreign plants brought from Africa, Europe and Asia. After the War of the Pacific, the public squares, which exhibited high native vegetation, are transgressed with the introduction of Mediterranean citrus, the same ones that after the War of the Chaco are changed by exotic tropical palms and fragile rosales of cold climates (Trigo, 1940, p. 35 y Ávila, 2013, p. 78).

Material and methods

The present research analyzed, through historical data, one of the most relevant periods of time for the department of Tarija, between the last two decades of the nineteenth century and the first of the twentieth century, when the country began to recover from the War of the Pacific (1879-1883) and suddenly faced the Chaco War (1932-1935), the same ones that transformed the country, but even more to the Tarijeño department. The objective of this study is to analyze the impact of these conflicts in the history of Urban Green of the city of Tarija, and answer current questions that could pose conclusive ideas seeking a projection of sustainable development for the region and the country.

The work was carried out applying the research methodology of historical-logical analysis of data, which were collected and collected from both European and Latin American historical archives and libraries, taking into account three frameworks:

1. Historical background (written or graphic information of local, national and international character, concerning the referred period of time).
2. Legislative framework (laws, ordinances, decrees, articles, etc.).
3. Framework of plans and projects (plans, programs, projects, etc., that took place for the city of Tarija in those years).

For the execution of the investigation four phases were designed:

Phase 1.- Compilation and analysis of information regarding the evolution and treatment of Urban Green in sustainable cities of the world.

Phase 2.- Compilation and analysis of the information regarding the War of the Pacific and the Chaco, and the evolution of urban green areas of the city of Tarija.

Phase 3.- Comprehensive, analytical, systemic and holistic interpretation and interpretation of the relevance of the information collected in phase one in relation to phase two.

Phase 4.- Diagnosis and evaluation of the degree of impact of the wars suffered in the history of the city's urban green.

In the third planned phase, the deductive theoretical methodology was used, being able to analyze and interpret the results of particular examples in relation to the topic of study of the present article.

Results

Through the present investigation it was discovered that in the last two decades of the nineteenth century and the first five of the twentieth century, there were the most significant losses of urban green surfaces in the city of Tarija. During this period the department suffered the most bloody conflicts in its history, which gradually translated into poverty, dissections of urban gardens and then a time of uncontrolled urban growth and without any planning or sustainable management over time.

Table 1. Comparative analysis of population and urban growth in the city of Tarija, Bolivia, from its foundation to the mid-twentieth century (1574-1950).

| Año | Población Habitantes | Porcentaje del crecimiento de la población | Área urbana (ha) | Porcentaje del crecimiento del área urbana |
|------------|-----------------------------|---|-------------------------|---|
| 1574 | 60 | - | 12.44 | - |
| 1606 | 152 | 2.9% | 44.61 | 4% |
| 1795 | 220 | 0.19% | 44.61 | 0% |
| 1827 | 2.010 | 0.71% | 123.94 | 0.46% |
| 1856 | 3.473 | 1.9% | 123.94 | 0% |
| 1865 | 8.311 | 10.1% | 123.94 | 0% |
| 1880 | 8.380 | 0.05% | 123.94 | 0% |
| 1891 | 10.113 | 1.72% | 123.94 | 0% |
| 1900 | 12.980 | 2.81% | 123.94 | 0% |
| 1929 | 20.549 | 1.59% | 184.727 | 9.76% |
| 1940 | 26.119 | 2.2% | 184.727 | 0% |
| 1950 | 31.691 | 1.95% | 377.58 | 7.41% |

Fuente: Elaboración propia a partir de datos del Archivo Histórico Departamental de Tarija, 2012, Hemeroteca de La Casa de la Cultura, 2016, Mapa de la expansión física en la ciudad de Tarija, Plan de Uso de Suelo Urbano (PLUS 2005 - 2025), Presencia Franciscana y Formación intercultural en el Sudeste de Bolivia según documentos del Archivo Franciscano de Tarija 1606 - 1936 Tomo I. P. Lorenzo Calzavarini, 2006, Trigo, 1940, Pérez, 2015, planimetrías elaboradas por el SIC Srl. y cartografía de la H. Alcaldía Municipal de la ciudad de Tarija, 2015.

In the years following the Pacific War, trade began to increase in the south of the country, because Bolivia had made its frontier regions the areas of product exchange. The research reveals that during the first five decades of the twentieth century the Tarija population doubled and the urban area grew by 9.76%, which meant the loss of soft surface due to the construction of new housing for residents (Morales, 1997, p. 13).

Table 2. Percentage analysis of the deteriorations produced by the Chaco War on the green surface of the urban area of the city of Tarija, Bolivia (polígono urbano de 184,727 ha).

| Parámetros estudiados | % en relación al total de área urbana antes de la Guerra del Chaco | % en relación al total de área urbana después de la Guerra del Chaco | Porcentaje afectado por la Guerra del Chaco |
|------------------------------|---|---|--|
| Parques | 1.65% | 0.15% | 1.5% |
| Plazas | 1.55% | 0 % | 1.55% |
| Plazoletas | 0.80% | 0.23% | 0.57% |
| Huertos Urbanos | 43% | 17% | 26% |

Fuente: Elaboración propia a partir de datos del Archivo Histórico Departamental de Tarija, 2012, Hemeroteca de La Casa de la Cultura, 2016, Mapa de la expansión física en la ciudad de Tarija, Plan de Uso de Suelo Urbano (PLUS 2005 - 2025), planimetrías elaboradas por el SIC Srl., Plan Departamento de Ordenamiento Territorial de Tarija, Bolivia 2006-2015 (PDOT, Tarija 2006 - 2025), cartografía de la H. Alcaldía Municipal de la ciudad de Tarija, 2015, Paz R., 1940 , cartografía de la H. Alcaldía Municipal de la ciudad de Tarija, 2015, Morales, 1997, Paz, 2011, Archivo fotográfico del Centro Eclesiástico de Documentación (CED) perteneciente al Convento Franciscano de Tarija, Bolivia, Archivos fotográficos privados y Archivo fotográfico de la Dirección de Gestión Cultural de la Gobernación del Departamento de Tarija, Bolivia.

Until the beginning of the 20th century, the Tarija capital had approximately 100 ha of green area, which housed a variety of native plant and animal species (Trigo, 1940, pp. 118-127 and Casal and Erazo 2003, pp. 6-9). Considering that these green spaces that sponge the urban structure interconnecting it with the rural areas, offering many benefits (Falcon, 2007, p.12), certainly the city and its whole were intrinsically related to nature, even the "no city" Within the urban and peri-urban territory, through forest, agricultural and aquatic means (Gómez, 2003, p. 2).

Table 3. Urban works executed in the first half of the 20th century for the development of the city of Tarija, Bolivia.

| Año de inicio | Año de finalización | Obra ejecutada | Carácter de la obra |
|----------------------|----------------------------|---|----------------------------|
| 1903 | Nunca se finalizó | Proyecto de la “Construcción del Ferrocarril para Tarija” | Nacional |
| 1908 | 1928 | Red eléctrica | Municipal |
| 1911 | 1950 | Red de Telefonía | Departamental |
| 1911 | 1911 | Plazuela Uriondo | Municipal |
| 1915 | 1915 | Servicio de Taxis | Municipal |
| 1915 | 1916 | Servicio de recolección de basura | Municipal |
| 1915 | 1931 | Parque Bolívar | Municipal |
| 1922 | 1930 | Puente Tomatitas | Departamental |
| 1922 | 1930 | Proyecto “Camino Villazón-Tarija” | Nacional |
| 1929 | 1940 | Cementerio General | Departamental |
| 1930 | 1932 | Proyecto “Camino hacia el Chaco: Tarija-Villamontes” | Nacional |
| 1932 | 1933 | Apertura de calles Ingavi y Colón | Municipal |
| 1939 | Hasta la actualidad | Red de Agua potable y Alcantarillado | Departamental |
| 1940 | 1940 | Remodelación de la Plaza Central | Municipal |
| 1940 | 1940 | Remodelación de la plazuela Narciso Campero | Municipal |
| 1940 | 1950 | Clausura de acequias en la ciudad | Municipal |
| 1940 | 1941 | Apertura de Avenida Domingo Paz | Municipal |
| 1940 | 1941 | Apertura de Avenida Potosí | Municipal |
| 1940 | 1943 | Apertura de la Avenida Costanera | Municipal |
| 1940 | 1950 | Proyecto “Mejoramiento de calles | Municipal |

| | | | |
|------|-------------------|-------------------------------------|-----------|
| | | y aceras de la ciudad de Tarija” | |
| 1943 | Nunca se finalizó | Proyecto “Parque las Barrancas” | Municipal |
| 1950 | 1951 | Construcción de “Puente San Martín” | Municipal |

Fuente: Elaboración propia a partir de datos del Archivo Histórico Departamental de Tarija, 2012, Hemeroteca de La Casa de la Cultura, 2016, Mapa de la expansión física en la ciudad de Tarija, Plan Departamento de Ordenamiento Territorial de Tarija, Bolivia 2006 - 2015 (PDOT, Tarija 2006- 2025), Plan de Uso de Suelo Urbano (PLUS 2005 - 2025), Presencia Franciscana y Formación intercultural en el Sudeste de Bolivia según documentos del Archivo Franciscano de Tarija 1606 - 1936 Tomo I. P. Lorenzo Calzavarini, 2006, Trigo, 1940, Pérez, 2015, Morales, 1997, planimetrías elaboradas por el SIC Srl. y cartografía de la H. Alcaldía Municipal de la ciudad de Tarija , 2015.

It is evident that during the first decades of the twentieth century the greatest amount of urban green areas were created, which were destroyed by the Chaco War, having to be rebuilt at the end of it. Around 19 of the 82 apple trees that made up the city were the most affected in the war, they were composed of private houses of exquisite colonial architecture, which maintained a harmonious dialogue between nature and city with circular metabolisms (Higueras, 2006, 54) .

Although at the time there was an intention to project the city managing its urban green areas, the findings show that it never recovered after the war period, and grew rapidly after that, devoid of effectively planned green areas.

Table 4. Comparative analysis of the scope of the Reforestation and Soil Recovery Plan of the valley of Tarija, Bolivia (1929 - 1947).

| Parámetros estudiados | Superficie en el año 1929 | Superficie en el año 1943 | Superficie en el año 1947 | Porcentaje de superficie dentro del polígono urbano hasta mediados del siglo XX |
|---|---------------------------|---------------------------|---------------------------|---|
| Superficie del polígono urbano de la ciudad de Tarija | 184.727 ha | 184.727 ha | 184.727 ha | 100 % del polígono urbano |
| Superficie deforestada | 11.65 ha | 68.4 ha | 70.6 ha | 38.22 % del polígono urbano |
| Superficie reforestada | 8 ha | 0 ha | 12.4 ha | 6. 71 % del polígono urbano |
| Superficie erosionada | 0.89 ha | 5.6 ha | 7.45 ha | 4.03 % del polígono urbano |

Fuente: Elaboración propia a partir de datos del Archivo Histórico Departamental de Tarija, 2012, Hemeroteca de La Casa de la Cultura, 2016, Mapa de la expansión física en la ciudad de Tarija, Plan de Uso de

Suelo Urbano (PLUS 2005 - 2025), planimetrías elaboradas por el SIC Srl., Plan Departamento de Ordenamiento Territorial de Tarija, Bolivia 2006 - 2015 (PDOT, Tarija 2006- 2025), cartografía de la H. Alcaldía Municipal de la ciudad de Tarija, 2015, Paz R., 1940 y datos analizados a partir de archivos fotográficos.

This research asserts that the Plan of Reforestation and Recovery of soils of the valley of Tarija, was ineffective for the urban area, because 25 of the 50 hectares were concluded to be reforested (Paz, 2011, p. 15-17).

Table 5. Percentage analysis of deteriorations produced by the Pacific War and the Chaco War on the green surface of the urban area of the city of Tarija, Bolivia (Polígono urbano de 123,94 ha hasta 1900, Polígono urbano de 184,727 ha hasta 1950).

| Parámetros estudiados | Guerra del Pacífico área urbana antes de la % en relación al total de | Guerra del Pacífico área urbana después de la % en relación al total de | Guerra del Pacífico Porcentaje afectado por la | Guerra del Chaco área urbana antes de la % en relación al total de | Guerra del Chaco área urbana después de la % en relación al total de | % afectado por la Guerra del Chaco |
|------------------------------------|---|---|---|--|--|---------------------------------------|
| Parques | 0% | 0% | 0% | 1.65% | 0.15% | 1.5% |
| Plazas | 0.6% | 0% | 0.6% | 1.55% | 0 % | 1.55% |
| Plazoletas | 0.56% | 0.43% | 0.13% | 0.80% | 0.23% | 0.57% |
| Huertos Urbanos | 55.8% | 47.48% | 8.32% | 43% | 17% | 26% |
| Áreas urbanas de masas arbóreas | 12.5% | 12.23% | 0.27% | 11.53 % | 5.22% | 6.31% |

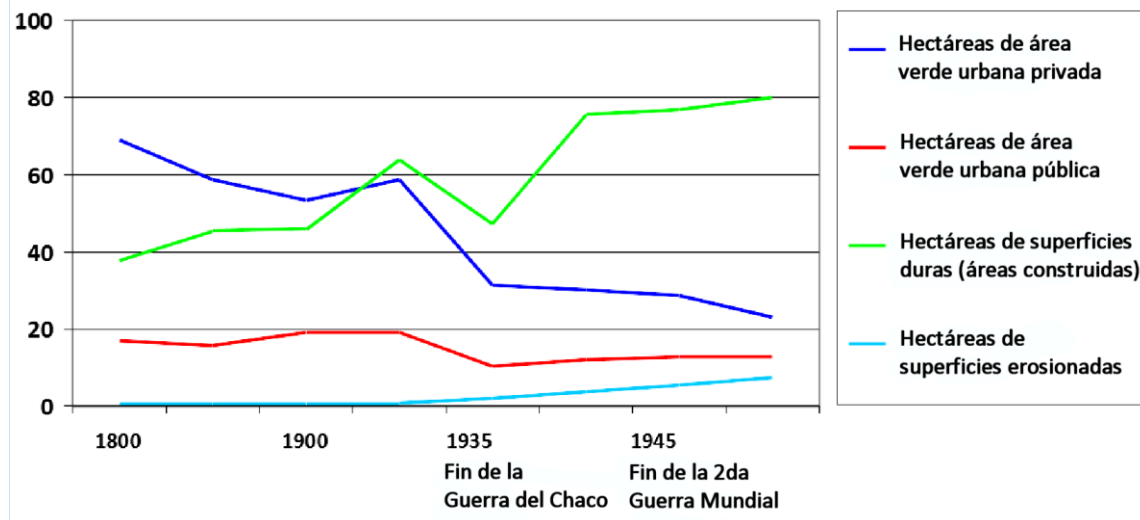
| | | | | | | |
|--|--------|--------|--------|--------|--------|------|
| Superficie dura (construcción de edificaciones públicas y privadas) | 30.56% | 36.59% | -6.09% | 41.46% | 34.56% | 6.9% |
|--|--------|--------|--------|--------|--------|------|

Fuente: Elaboración propia a partir de datos del Archivo Histórico Departamental de Tarija, 2012, Hemeroteca de La Casa de la Cultura, 2016, Mapa de la expansión física en la ciudad de Tarija, Plan de Uso de Suelo Urbano (PLUS 2005 - 2025), planimetrías elaboradas por el SIC Srl., Plan Departamento de Ordenamiento Territorial de Tarija, Bolivia 2006-2015 (PDOT, Tarija 2006 - 2025), cartografía de la H. Alcaldía Municipal de la ciudad de Tarija, 2015, Paz R., 1940 , cartografía de la H. Alcaldía Municipal de la ciudad de Tarija, 2015, Morales, 1997, Paz, 2011, Lema, 1890, Baptista, 1978, Ministerio de Relaciones Exteriores de Bolivia, 2014, Archivo fotográfico del Centro Eclesiástico de Documentación (CED) perteneciente al Convento Franciscano de Tarija, Bolivia, Archivos fotográficos privados y Archivo fotográfico de la Dirección de Gestión Cultural de la Gobernación del Departamento de Tarija, Bolivia.

Findings show that after the two wars that Bolivia experienced in the late nineteenth and early twentieth centuries, the city of Tarija lost more than half of its urban gardens, noting that it was after the Chaco War, when Greater percentage of green surface was destroyed within the urban polygon.

Throughout the twentieth century, more than 30 plant species were introduced to the department of Tarija. Only four other alien species were placed with the Plan of Reforestation and Soil Recovery of the Tarija Valley (1943-1947), severely altering the coastal ecosystems And the scarce urban nature of the city (PDOT, Tarija 2006 - 2025, pp. 201-210, Peace R. 1940, p 47, and Morales, 1997, p. A list of plant species introduced in the central tarijeño valley was verified.

Figure 1. Analysis of the deterioration produced in the urban green surface of the city of Tarija, Bolivia, throughout the war period of the late nineteenth century to the middle of the twentieth century.



Fuente: Elaboración propia a partir de datos del Archivo Histórico Departamental de Tarija, 2012, Hemeroteca de La Casa de la Cultura, 2016, Mapa de la expansión física en la ciudad de Tarija, Plan de Uso de Suelo Urbano (PLUS 2005 - 2025), planimetrías elaboradas por el SIC Srl., Plan Departamento de Ordenamiento Territorial de Tarija, Bolivia 2006-2015 (PDOT, Tarija 2006- 2025), cartografía de la H. Alcaldía Municipal de la ciudad de Tarija, 2015, Paz R., 1940 , cartografía de la H. Alcaldía Municipal de la ciudad de Tarija, 2015, Morales, 1997, Paz, 2011, Lema, 1890, Baptista, 1978, Ministerio de Relaciones Exteriores de Bolivia, 2014, Archivo fotográfico del Centro Eclesiástico de Documentación (CED) perteneciente al Convento Franciscano de Tarija, Bolivia, Archivos fotográficos privados y Archivo fotográfico de la Dirección de Gestión Cultural de la Gobernación del Departamento de Tarija, Bolivia.

The graph clearly showed that the period with the highest peaks of urban changes was located between the Pacific War and the Chaco War, the latter being the one that caused the most damage to the Urban Green and built surfaces, which gradually led to a greater Degree of erosion.

Discussion

The history of the city of Tarija has large gaps with very little information properly documented and difficult to consult, even more than the nineteenth and twentieth centuries, which paradoxically is a period where both the Bolivian Republic and the Tarijeño Department lived wars, political changes , Great growth and development, followed by years

of serious crisis and famine, but above all, there were significant changes for the environment.

The objective of this research is to holistically analyze the repercussion of the War of the Pacific (1879-1883) and the Chaco War (1932-1935) on the history of the Urban Green of the city of Tarija, to understand the reality that we live in the present and be able to propose effective solutions for the future.

The results found with the present investigation indicate that the city was always linked to nature, but there were two moments in its history that determined the relationship between the city and the environment (Archivo Histórico Departamental de Tarija, 2012, p. -189; and Paz, 2011, p.36). The findings establish that although in the late nineteenth century urban green areas were incipient, private gardens occupied 55.8% and urban areas with tree stands 12.5% of urban polygon, however after the Pacific War these occupy a 47.48 % and 12.23% respectively, thus losing a total of 8.59% of urban green area, which shows that this was the first significant moment for the denaturalization of the city.

As a consequence of the loss of the exit to the Pacific Ocean, the commercial movement in Tarija gained notoriety as an intense activity began across the Atlantic Ocean. Starting in 1910, commercial houses were set up with an important supply of goods, a situation that generated money flow that caused notable changes in the city, such as the creation of more green areas and the improvement of existing ones (Wheat, 1940, 48, and Historical Departmental Archive of Tarija, 2012, page 33). For three decades, what Hough (1998) called as an effective connection between the dynamics of natural processes and the dynamics of humanity in the city was achieved, obtaining a naturalized city that experienced the positive effects that this entails.

The Chaco War (1932-1935) is the second and most important moment for the region and the history of its Urban Green, since it destroys a city that was in the process of development that already had 4% of green areas, 43% of urban orchards and 11.53% of tree masses

within the urban polygon, leaving 80% of urban green areas affected (Castellanos, 1937, p.4, and Franceschini, 1932, p.5).

In addition, it is demonstrated that the impact of the damages caused by the Chaco War transcends until decades later, since from 1943 together with the ineffective Plan of Reforestation and Recovery of Soils of the Valley of Tarija begins to change the vegetation of all the Green areas, replacing healthy and native trees by outsiders, under the idea of "remodeling of green areas" (Paz G., 2011, pp. 69-78). In a city with a relative density of tree mass, the vegetation itself produces 10% of the oxygen consumed by its inhabitants, as well as one hectare of fixed deciduous forest 17.6 t / ha / year of CO₂, producing 17.6 t / ha / year of O₂ And retains 61 t / ha / year of dust (Falcón, 2007, pp. 26-27), in this sense it is alarming to think that by new fashions and ideas without foundation, half a hundred healthy trees were felled in a city that needed them urgently.

Thus, all this loss of forest mass affects the hydrological cycle (Xercavins, et al., 2005, pp. 37-39), consequently the territory suffers a serious environmental deterioration, impairing the delicate ecosystem equilibrium and the benefits that it offers . It is striking to think that only in the first half of the twentieth century has the world lost a quarter of fertile soil and a third of its forest cover (Riechmann J., 2006, p. Of the Chaco contributed to this.

That socio-ecological connectivity and the naturalization processes that helped by a bioclimatic architecture could occur effectively inside and outside the city, were truncated dramatically throughout the twentieth century, disarticulating the relations between nature and urbanity, and gave way to the unsustainable City that currently has.

It should be noted that the present investigation attempts to elucidate the gaps in the history of Tarija, although it is an arduous task due to the difficulty of accessing the scarce existing information, the findings found clearly answer to the current reality and will help in the future To project efficient solutions for the city and the country.

Conclusions

At the end of the 19th century, after the Pacific War, the favorable economic moment that the city of Tarija lived was decisive in rebuilding it and projecting it with greater urban naturalization, but those effective and ineffective undertakings were destroyed during the Chaco War. This study reveals that as a result of these two warlike events, an accelerated process of denaturalization and historical-architectural loss began, which continues to the present day.

The research showed that between 1883 and 1940 there were the largest changes in the green urban area of the city, both the public and private urban green areas decreased by 46%, while the hard surface occupied by buildings increased by one 36.5% up to the first decade of the 20th century, but decreased at the end of the Chaco War by 6.9%, and eroded soils became almost non-existent when they occupied 4% of the area of the urban polygon. In half a century, the city went from having an urban configuration effectively naturalized to an agglomeration where hard surfaces prevailed and the serious problem of soil erosion began to be evident. This war stage opened an insurmountable gap between the city-nature relationship, which could never be closed.

Although environmental damage was attempted with the 1943 Reforestation Plan, only urban and rural ecosystems were further damaged, introducing foreign species that acidified the soils and altered the delicate natural balance irreversibly.

During the first half of the twentieth century, more than half of the urban green surface was lost, and far from compensating for damages, the city continued to grow excessively without contemplating regulations regulating Urban Green planning within the growing polygon. At present, the same patterns of development are being handled. Taking into account the findings of this research, it is feared that in the near future the Urban Green will be more incipient and ineffective, and the naturalization of the city will disappear.

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