

EXTENDED ABSTRACT

OPEN SPACES IN MEDIUM-SIZED CITIES IN BUENOS AIRES PROVINCE: CHALLENGES AND OPPORTUNITIES FOR BLUE GREEN INFRASTRUCTURE. THE CASE OF CHASCOMÚS, ARGENTINA

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1. INTRODUCTION

In small and medium-sized cities across the interior of Buenos Aires Province (Argentina), disorganized and unregulated urban sprawl—particularly through gated community developments—has created significant challenges for territorial and urban sustainability in the context of today’s triple planetary crisis (climate, ecological, and social). These pressures are compounded by the expansion of intensive agriculture, leading to “strangled” territories characterized by biodiversity loss, the erosion of cultural landscapes, and reduced climate adaptability. These transformations have intensified tensions between socioeconomic development, environmental conservation, and community well-being.

In this scenario, public open spaces (POS)—understood as predominantly unbuilt public areas with ecological, recreational, and cultural functions—play a key role in strengthening urban resilience and well-being. From an urban ecology and geography perspective, and within the framework of Nature-Based Solutions (NbS), these spaces are not only important for social and aesthetic reasons but are also critical to providing ecosystem services such as flood regulation, heat mitigation, biodiversity corridors, and improved public health. Despite their strategic value—in this context and kind of cities—POS are frequently overlooked in planning instruments or considered abundant, leading to a lack of protective regulations and uneven distribution across urban territories.

The city of Chascomús embodies these dynamics. With strong ties to tourism and natural resources like wetlands and lagoons, it faces challenges associated with diffuse urban

expansion, fragmented policies, and growing pressures on POS and ecologically valuable ecosystems. Previous studies have shown that urban planning in Chascomús has consistently underestimated the structural role of POS in shaping a more sustainable urban model.

2. OBJECTIVES

The article aims to analyze the distribution, typology, and functionality of POS in Chascomús from an NbS approach—particularly through Blue-Green Infrastructure (BGI)—with the goal of guiding their integration into a network that supports urban sustainability, territorial equity, and responsible tourism.

Specifically, the study maps and classifies POS by type, scale, and consolidation level, assessing accessibility, equipment, and per capita availability. The analysis applies regional and international benchmarks in the absence of local standards and pays particular attention to spatial inequalities. It also identifies critical gaps, opportunities, and future planning priorities for the integration of POS into a sustainable territorial model.

The resulting conceptual and methodological framework is intended to be replicable in other medium-sized tourist cities in the region, especially those located in ecologically sensitive areas like the Pampas wetlands, where urban and agricultural pressures threaten environmental balance.

3. METHODOLOGY

This study follows a qualitative-quantitative and exploratory approach, centered on the case of Chascomús, a medium-sized city in Buenos Aires Province. The research adopts a territorial perspective, combining socio-spatial analysis tools, fieldwork, and documentary review, with the aim of assessing the distribution, typology, and functionality of POS, and generating inputs for a potential BGI strategy.

Territorial Context

Chascomús shares characteristics with other medium-sized cities in the interior of the province: large surface area (3,159 km²), low population density (13.4 inhabitants/km²), and moderate but sustained demographic growth. As of the 2022 census, the city had 42,452 inhabitants, 90% of whom reside in the main urban center. Its relationship with the Chascomús Lagoon and regional connectivity via National Route 2 and the former Roca railway line position it as a strategic tourism and territorial exchange node. The municipality lies within the Salado River Basin, featuring a hydrological system of lagoons, streams, and wetlands, now heavily impacted by unregulated urbanization and intensive agriculture since the 1990s.

Analytical Design

A territorial and socio-spatial analysis perspective is adopted, organized in four phases:

a) *Mapping and Typology Development*

POS were mapped using base cartography, satellite imagery (2015, 2021), aerial photos (1965, 1984, 1985), and municipal records, all POS were geolocated and digitized. They were

classified into three major types: primary green structure (e.g., lagoons, periurban parks), secondary green structure (e.g., plazas, institutional courtyards), and connectors (e.g., boulevards, green corridors, road islands). Parks and squares influence radii were calculated using international standards (e.g., 500m for neighborhood parks, 800–2000m for larger urban parks).

b) *Functional Characterization*

Squares, parks and boulevards (secondary and connective green infrastructure), were surveyed and classified. Field surveys were conducted to assess infrastructure, accessibility, types of use, maintenance status, and vegetation coverage.

c) *Consolidation Level Evaluation*

A scoring system (0–27 points) was developed based on eight criteria collected in functional characterization: vegetation, accessibility, equipment, lighting, infrastructure, maintenance, use intensity, and urban integration. Spaces were grouped and analyzed into four categories: High, Medium, Low, and Null consolidation.

d) *Population–POS Relationship*

Census data (INDEC, 2010) and urban planning data and projections (Territorial Development Plan, 2014) were used to assess green space per inhabitant by census tract, comparing current conditions and future scenarios. The study analyzed POS availability against international standards (10 m²/inhabitant as national, 18 m²/inhabitant as European reference). Disparities in access were analyzed, highlighting underserved zones.

This comprehensive methodology provides a replicable framework for POS assessment and planning in other cities with similar characteristics.

4. RESULTS

4.1. Coverage of POS by Area of Influence

The distribution of POS in Chascomús reveals strong spatial disparities. While the historic city center concentrates most plazas, boulevards, and lagoon-front spaces—ensuring high accessibility—it also faces overuse, particularly during peak tourism periods. In contrast, peripheral and transitional neighborhoods (northwest, east, southeast, and far north) have limited or no access to POS, reflecting fragmented urban growth and a lack of planning in newer residential developments.

Smaller plazas often fail to meet proximity standards (500–800 m), and larger parks (1000–2000 m radius), due to their peripheral locations, are poorly integrated and underutilized.

4.2. Consolidation and Functionality of POS

POS vary widely in quality:

- Highly consolidated spaces (mostly in central areas) have mature vegetation, infrastructure, and high use, but are often overloaded.
- Moderately consolidated spaces are functional but need upgrades.
- Poorly or non-consolidated areas suffer from lack of maintenance, access, and basic facilities—especially in vulnerable neighborhoods—and some are degraded or abandoned.

This center-periphery divides highlights underinvestment in the urban fringe. However, certain degraded spaces show spontaneous vegetation recovery, offering potential for future integration into a BGI network.

Tourism adds further strain to consolidated POS, particularly waterfront parks and central plazas, which suffer from overcrowding, infrastructure stress, and conflicts between locals and visitors. This dynamic deepens spatial inequality and neglects underdeveloped areas. The absence of regulatory tools for managing tourism and natural spaces exposes sensitive ecosystems—such as wetlands and lagoons—to degradation, threatening long-term sustainability and ecosystem service provision.

4.3. Green Space per Capita and Population

Significant inequalities were found in POS availability:

- Some census tracts exceed 18 m²/person, while others fall below 10 m² or have none at all.
- Recently urbanized zones are especially underserved due to the absence of planning and infrastructure.
- Even existing POS in these areas often face limited usability due to poor maintenance, access issues, or environmental degradation (e.g., flooding, waste).

Future projections (PDT, 2014) warn that urban densification could worsen these deficits unless environmental compensation mechanisms are adopted.

5. CONCLUSIONS AND RECOMMENDATIONS

This study reaffirms the strategic role of POS as essential infrastructure for ecological sustainability, social cohesion, and responsible tourism. In Chascomús, despite a substantial number of POS, their fragmented distribution, poor connectivity, and uneven quality limit their effectiveness—especially in peripheral and transitioning areas where planning and maintenance are insufficient. Critical inequalities were found in per capita green space, likely to worsen with future densification if environmental compensation is not addressed. Tourism intensifies pressure on well-equipped central spaces, leading to overcrowding, infrastructure deterioration, and social tensions.

Key Challenges:

Fragmented POS network with poor functional integration; Unequal distribution and lack of accessibility and continuity; Investment concentrated in central and tourist zones; Absence of legal tools for regulating POS under urban expansion; Poor-quality infrastructure in vulnerable sectors.

Opportunities:

Existing territorial base of POS with restoration potential; Vacant and underused spaces suitable for BGI integration; Growing awareness of POS as a pillar of sustainable planning.

Recommendations:

Plan POS as part of a systemic, multi-scale BGI network; Prioritize investment in underserved areas and restore degraded spaces; Establish legal standards for minimum green space and ensure environmental compensation; Regulate tourism use of POS with inclusive, sustainable criteria; Strengthen local governance through spatial monitoring and participatory planning; Promote environmental education and public ownership of open spaces; and Implement adaptative management with ongoing evaluation.

Although centered on Chascomús, these recommendations are transferable to other medium-sized cities facing similar urban-environmental dynamics. Embracing BGI offers a pathway to both improved urban resilience and access to climate adaptation funding.