Navigating Change: Investigating Environmental and Social Challenges in the Reconquista River Basin, Buenos Aires

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Independent project • 15 credits
Swedish University of Agricultural Sciences, SLU
Faculty of Landscape Architecture, Horticulture and Crop Production Sciences
Department of Landscape Architecture, Planning and Management
Landscape Architecture Programme
Alnarp 2025

Navigating Change: Investigating Environmental and Social Challenges in the Reconquista River Basin, Buenos Aires

Navigering av förändring: Undersökandet av hur miljömässiga och sociala utmaningar i Reconquista området i Buenos Aires ser ut

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Credits:	15 Credits
Level:	First cycle, G2E
Course title:	Independent project in Landscape Architecture
Course code:	EX0845
Programme/education:	Landscape Architecture Programme
Course coordinating dept:	Department of Landscape Architecture, Planning and Management
Place of publication:	Alnarp
Year of publication:	2025
Cover picture:	Sannah Gallén & Klara Skärskog

Keywords:	Landscape Architecture, Buenos Aires, San Martín, Reconquista River, Urbanization, Climate change, Green-blue infrastructure, Community engagement, Women's involvement, Public space

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Acknowledgements

This bachelor thesis is part of the MFS stipend, funded by SIDA that gives students at Swedish universities the opportunity to do field studies in countries where Sweden conducts development cooperation.

Without all the help and support, this thesis would not have been possible. Therefore, we would like to express our gratitude to:

… Our program study director Caroline Dahl, for making this exchange come true. Thank you for helping us from the start, guiding us in the stipend application process and for introducing us to Lisa Diedrich. Your constant support never wanted us to give up during this journey.

… Our supervisors Lisa Diedrich and Lisa Norfall, for all encouragement and support during the application and these two months. Thank you, Lisa D, for all your interesting ideas, making us think outside the box. Having you on-site in Buenos Aires has been a privilege. And thank you, Lisa N, for having our full support from Sweden. Talking to you during supervising meetings helped us widening our perceptions. Our deepest thanks to both of you, pushing us forward and answering us fast.

… Guido Fischer and his team at DISU, for introducing us to your work and inviting us to join happenings on-site to understand Buenos Aires and San Martín from a different perspective. Thank you Guido for your patience and support guiding us in the Reconquista river area, helping us whenever we asked for something.

… Axel Gallén, for the support and helping us through these two months with proof-reading and giving feedback on our thesis so we could improve our writing language.

… Our families and friends, giving support and love during our two months away. We look forward to seeing you again after submitting this thesis!

Abstract

This study examines the relationship between gender, community engagement, and environmental sustainability within the context of the Reconquista river basin in Buenos Aires, Argentina. As urbanization and climate change pose significant challenges to cities, particularly in low-income countries, this research focuses on the socio-environmental issues prevalent in one of the most affected areas along the river, characterized by dense populations and fragmented municipal governance. This thesis analyzes the current blue-green infrastructure and the political and social landscapes surrounding the river by utilizing various qualitative research methods—including literature reviews, Travelling transects, interviews, and action research. The role of local communities, notably women from San Martín are essential actors in managing green infrastructure and advocating for their neighborhoods. It clarifies how participatory approaches can influence sustainable urban development and river management practices to address ecological restoration and community empowerment in the face of climate change. The findings show the critical importance of integrating the community and their insights into planning processes to foster resilience and sustainability in urban landscapes.

Keywords: Landscape Architecture, Buenos Aires, San Martín, Reconquista River, Urbanization, Climate change, Green-blue infrastructure, Community engagement, Women’s involvement, Public space

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Abbreviations

AMBA - The Buenos Aires Metropolitan Area

CABA - The Autonomous City of Buenos Aires

CEAMSE - Coordinación Ecológica Área Metropolitana Sociedad Estado

COMERIC - The Reconquista River Basin Committee

DISU - the Department of Socio-Urban Integration, Municipality of San Martín in the greater Buenos Aires region

NBS - Nature-based solutions

SLU - Swedish University of Agricultural Science

1. Introduction

Urban areas are among the leading contributors to climate change today, and the effects of urbanization and climate change are rapidly approaching in dangerous ways. In the coming decades, residents in urban areas can be expected to be affected by rising sea levels, increased precipitation, inland floods, and periods of more intense heat and cold. Urban poor people living in marginalized areas in developing countries are among the most affected. They tend to live near riverbanks, along waterfronts in coastal areas, near polluted ground, and on desertified land (UN-HABITAT, n.d.a).

Argentina's capital city, Buenos Aires, is fragmented, suffering from distinct socio-spatial segregation. The city reflects a complex interplay between social dynamics, economic inequalities, and conflicting attempts to adapt to the urban environment (Janches, 2012). With the city's development and urbanization surrounding Buenos Aires, the relationship between the watercourse and the Reconquista river basin has changed. The Reconquista river is one of the most polluted waterways in Argentina, running through Buenos Aires (Nader, Sanchez Proano & Cicerone, 2013).

In the Reconquista river basin, the Municipality of San Martín is located within a dense population area that brings together many socio-environmental problems from several municipalities sharing the river bank (Gobierno De La Provincia De Buenos Aires, 2018). San Martín is one of the municipalities with the highest land occupation of informal settlements. In line with what UN-HABITAT (n.d.a) describes, the informal settlements often occur on the riverbank and near polluted ground close to factories. The proximity to landfills causes a vulnerable living situation for the residents who today suffer from the consequences of flooding, degradation, and environmental pollution (Paredes, 2010).

To tackle social-environmental problems, urban planning is essential. The Urban Development Unit at Municipality of San Martín (DISU) works with urban planning to comprehensively assess social, economic, and environmental factors linked to physical planning. It includes involving the community and listening to the residents to enhance the green infrastructure for its ecological benefits and social cohesion. Therefore, public space in the city could be crucial for creating sustainable cities and communities. The public space offers an opportunity to improve the quality of life for all urban residents. However, research shows that a lack of public spaces reduces the quality of life, resulting in increased crime, social segregation, and overall health issues for urban residents (UN-Habitat, n.d.). The area of the Reconquista river basin has a lack of public space, with about 3.2 m2/inhabitants, a low number compared to the 10 m2/inhabitants that the local legislation suggests (Álvarez, 2010).

The discipline of landscape architecture fits well within the sustainable development framework, emphasizing a multidimensional approach to sustainability (Zeunert, 2023). In landscape design, the dynamic nature of the environment and the relationship between human and nature are always present and characterize the landscape. As landscape architects, our part in urban development processes could help us improve design connected to urban public spaces. While not every problem can be solved immediately, it is important to address them to advance research for the future. Landscape architects are ideally positioned to create functional spaces for the future but also, through landscape design in the present, foster a broader awareness, acceptance, and involvement in the public in addressing the complex ecological, social, and political challenges (Diedrich & Lee, 2019).

1.1 Aim and research questions

The relevance of this study lies in how cities in low-income countries, like Buenos Aires in Argentina, work together as authorities and residents towards sustainable societies. Buenos Aires is an interesting city to study as it has complex relationships between social fragmentation, changing climate, affected ecosystems and rivers, and underutilized basic public service. Reconquista is, therefore, a suitable example to study since its surrounding areas include ecosystems affected by the underutilized basic public service. Therefore, recommendations for developing two sites in the Reconquista river area will be proposed and analyzed, creating a basis for DISU to examine how they can further their research to develop public spaces.

This research analyzes the social conditions and blue-green infrastructure surrounding the Reconquista river area in Buenos Aires. It seeks to understand how the involvement of local communities, particularly women, shapes sustainable urban development and river management.

To do this, we will focus on the following questions:

What are the current blue-green infrastructure and social conditions surrounding the Reconquista River, and how does the Department of Socio-Urban Integration, engage residents in San Martín in efforts to improve public spaces in the river landscape?

What roles do local communities, particularly women, play in managing green infrastructure in San Martín, and how can their participation be integrated into local planning and urban development to support the restoration and development of the Reconquista river area?

1.2 Delimitation

This research focuses on ecological and social sustainability in the middle basin of the Reconquista River. The research will particularly emphasize a community-based approach and explore how it can be implemented in the development of urban public spaces. Additionally, the political and economic context is considered, while our primary aim is to understand the role of women in the chosen geographical area. The research will not delve into the political or economic issues from a broader perspective.

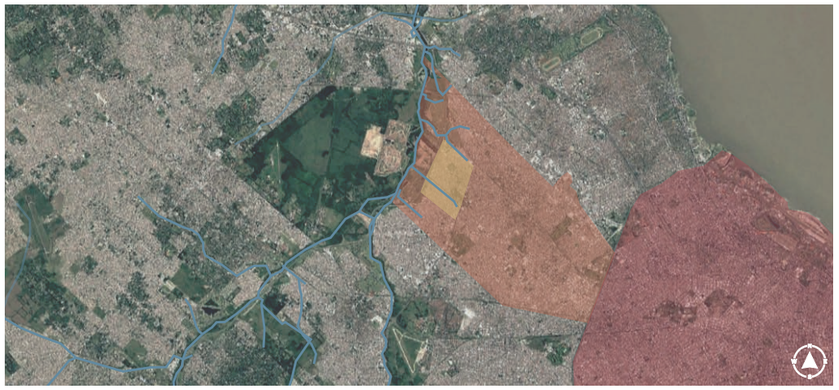


Fig. 1. Aerial photo © Google Earth. Map over geographical location of the city of Buenos Aires shown in red, location of General San Martín shows in orange, the Reconquista River shown in blue and the area for the travelling transect shown in yellow. (Illustration Sannah Gallén 2025-03-01 on an aerial photo from Google Earth 2025)

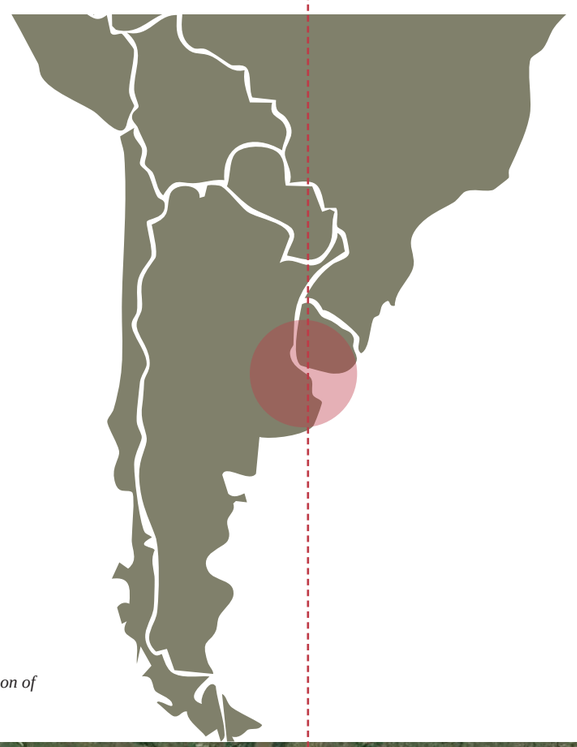
The geographical context of the study is limited to San Martín and the neighborhoods surrounding the Reconquista river basin, as highlighted in figure 1. San Martín was selected because, as a municipality, it exemplifies the challenges of a fragmented city within the metropolitan area of Buenos Aires. Despite these challenges, it is also a well-developed municipality that has the potential to work towards finding solutions for developing public spaces in marginalized areas.

The public spaces chosen for this research reveal different relationships between social conditions and the presence of green, blue, and grey infrastructure. These spaces are located in areas with varying population densities, often reflecting the social status of their residents. Since the area consists of informal and integrated neighborhoods, the site visits were conducted in collaboration with DISU, who also guided us on-site throughout the process. The visits were conducted over several days, with stops at chosen locations. It is important to note that the research does not cover the area nearest to the Reconquista river basin since its margin consists of informal settlements that are unsafe to access, inaccessible industries, and open-air waste dumps.

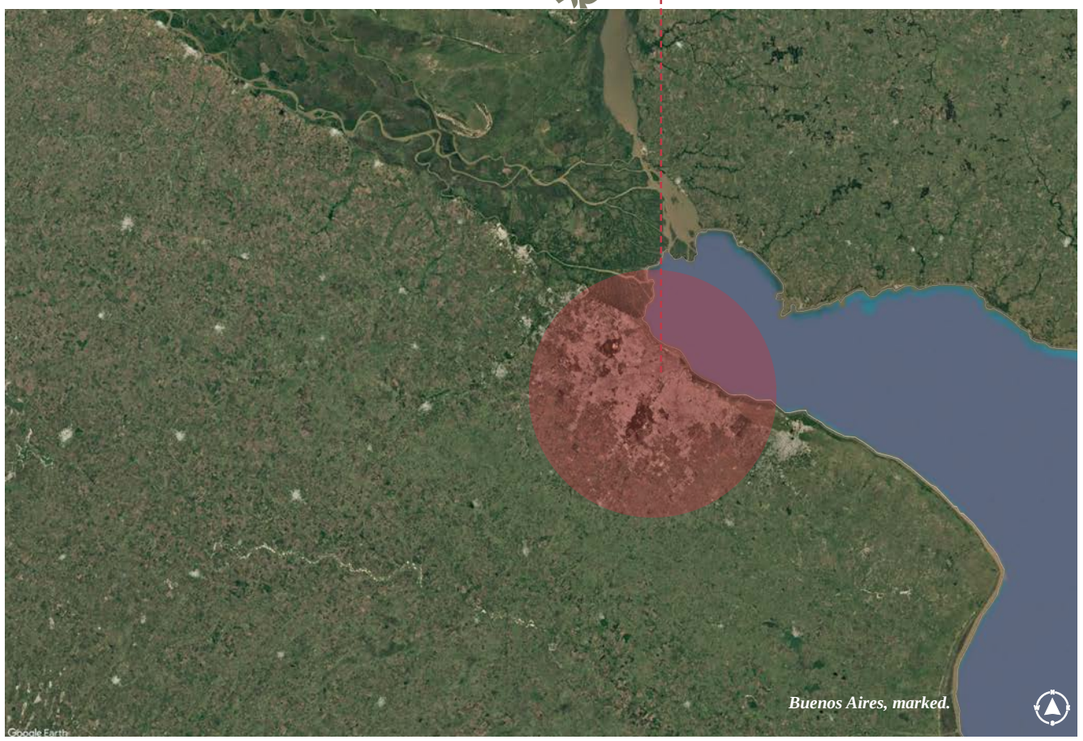
1.3 Empirical material

In this chapter, we provide an overview of Argentina's environmental, social, and economic challenges, with a particular focus on Buenos Aires and the Reconquista River.

World map, destination of thesis marked.



Map of a part of South America, destination of thesis marked.



Buenos Aires, marked.

Argentina, the eighth-largest country in the world, is located in South America and has approximately 46.1 million people (United Nations Population Fund, 2024). Geographically, it can be divided into four regions: The Andes mountain range in the west, Patagonia in the south, the prairie area of Pampas, and varied plains in the far north. Due to this landscape variety and Argentina's coastal location, the country has a diverse geophysical landscape range from tropical climates in the north to tundra in the far south (Landguiden, 2023).

About one-third of Argentina's population resides in Buenos Aires, the capital city (World Population Review, 2024). Located on the eastern coast, the Metropolitan Area of Buenos Aires encounters the Atlantic Sea and Rio de la Plata, an estuary formed where the Paraná and Uruguay Rivers merge. The city is traversed by several rivers, including the Matanza-Riachuelo, Reconquista, and Luján (Google Maps, 2024).

Buenos Aires is divided into 135 municipalities, called "Partidos" (Argentina.gob.ar, n.d.). One of these is San Martín, located in northern Buenos Aires, with around 450,000 residents. Today, it is a highly urbanized and well-developed municipality characterized by its industrial conformation with a diverse range of different areas (San Martín, n.d.c). In the north part of the municipality, there is a green-blue area where the Reconquista River, the second most polluted waterway in Argentina, flows. The pollution in this river generally originates from the industrial activities in the river basin (Nader, Sanchez Proano & Cicerone, 2013) as well as from informal settlements with a lack of proper waste management that frequently are situated along the rivers due to the extensive urbanization in the Buenos Aires Metropolitan area (Britannica, n.d.).

1.4 Perspectives in literature

In this chapter, we explore theories relevant to help us understand the geographical, ecological and social context in Buenos Aires and the Reconquista river area. Since our experience as landscape architecture students affects our approach to analyzing on-site, theories will help us complete our analysis. We discuss sustainable development, underscoring the significance of both social and ecological sustainability. Additionally, we emphasize the necessity of urban planning and community engagement in enhancing living conditions. Moreover, we assess the status of women's rights, bringing attention to the persistent issue of gender inequality.

1.4.1 Sustainable development

Brundtland (1987) was the first to explain the term "sustainable development" as "[...] development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987, p. 41). Since then, efforts toward sustainable development have increased globally. It now serves as a leading framework for international policy, exemplified by the Global Goals agreed upon in 2015 (IISD, n.d.). These goals aim to address and eliminate poverty and other forms of deprivation by promoting social, economic, and ecological sustainability (United Nations, n.d.).

1.4.1.1 Social and ecological sustainability

Social sustainability promotes social justice, economic opportunity, equality, health, and education, fostering diverse communities with a high quality of life (ADEC, n.d.). To achieve sustainable development, it is essential to prioritize people and ensure they feel included in the development process, which helps build better societies (World Bank Group, 2023). Challenges such as poverty, hunger, and inequality affect social sustainability, while climate change threatens ecological sustainability (Global Goals, n.d.). Ecological sustainability ensures that natural resources are available for current and future generations. It is crucial for the world to recognize the limitations of nature as a resource and to find a balance between human development and the preservation of the environment (Borland, Ambrosini & Lindgreen, 2014).

1.4.1.2 Informal settlements

Informal settlements are sporadic and located on spontaneous, often state-owned, private, or communal land occupied by migrants and local poverty-stricken people (UNHCR, n.d.). Appearing unplanned, it is a consequence of the extensive urbanization that grows and is taken care of by the residents themselves (Ghasempour, 2015). The primary causes of residents settling down in these settlements are inadequacy of housing and loose requirements for formal documentation (UNHCR, n.d.). Looking at the periphery, Janches (2012) describes it as a "marginalized place characterized by a lack of integration and socio-cultural links to the broader city network" (Janches, 2012, p.38). High levels of poverty and social stigma mark the periphery. Here, you often find land that is empty and undesirable. Therefore, it has become an area for informal settlements, which residents themselves build.

Furthermore, residents in formal urban regions perceive informal settlements as dangerous, contributing to their fragmentation. Even because of this, these settlements support some social cohesion and resilience (Janches, 2012). With the rise in global population, the Global Goals (n.d.) highlight the need for cities to create affordable housing and services. This shows the importance of including these areas inside city limits for lasting development.

Janches (2012) advocates for improved living conditions by developing public green spaces, recognizing community structures and cultures, and enhancing infrastructure and social services. Green spaces can foster social interactions and integration among residents of informal settlements and surrounding urban areas (Janches, 2012). Improving these public green spaces lies in improving the quality of life—crime and violence decrease, which benefits human rights, especially women, since formal and informal activities. The general environment becomes safer for everyone (UN-HABITAT, 2018).

1.4.1.3. Women's role in Latin America

In Latin America, women are often placed below men in forms of discrimination and lack of equality. This gender inequality hinders societal and national growth. Biased perspectives and actions against women persist in various areas, including family, education, healthcare, and politics. Lower salaries, limited education and healthcare, and hindrances to owning land and taking loans are some instances these women bear with (SIDA, 2002).

However, women's rights have improved, particularly since the re-establishment of democracy in Argentina in 1984. However, the concept of gender equality between women and men remains unclear. Discrimination and insufficient legal resources for women are problems that lead to violence and femicide. In 2019, femicides rose by 10% compared to 2018. However, in that same year, a law was enacted to prevent violence, which requires public employees to undergo training on violence against women. Laws addressing violence against women are gradually increasing, with a strong emphasis on supporting women who have been affected (Regeringskansliet, 2019).

A crucial part of achieving sustainable development is women's equal rights. According to the Global Goals (n.d.), women's social, political, and economic equality will benefit everyone (Global Goals, n.d.). With the fact that women and girls represent half of the world's population, the importance of achieving gender equality makes more sense. Enhancing their lives and opportunities leads to women having access to work and generating income. Along with that, the liability of women increases. If half of the population has access to work, it will contribute to poverty reduction, health, and education for themselves and all. (UN Women, 2018).

According to the UN Women's Report (2018), Women's involvement in their community, not only in climate-related discussions, leads to more effective solutions for urban challenges. Sustainable development in urban areas depends on women's rights to safety and participation in urban spaces (UN Women, 2018). With Sweden's financial assistance, the safety and rights of women and girls are one of the government's thematic priorities. The financial means will prioritize strengthening law enactment in favor of women's rights and their own lives and decisions (Regeringskansliet, 2019).

1.4.1.4. Nature-based solutions

Nature-based solutions (NBS), is a powerful term, but it requires urban green infrastructure and ecosystem services for further definition and systematic implementation in urban areas (Pauleit, Zölch, Hansen, Randrup & Konijnendijk, 2017). It is a concept often discussed in broader discussions on climate change adaptation, green infrastructure, and ecosystem services (Emilsson & Ode Sang, 2017). The idea of NBS is that the actions are inspired by, supported by, or copied from nature (European Commission, 2015). Frantzeskaki (2019) defines NBS as ”living solutions underpinned by natural processes and structures that are designed to address various environmental challenges while simultaneously providing multiple benefits to the economy, society, and ecological systems” (Frantzeskaki, 2019, p. 101).

The concept can be summarized in four points. The first point focuses on conserving biodiversity and improving ecosystem services to find solutions to a changing climate, addressing poverty, and promoting a green economy. NBS is broad and spreads from protecting and expanding forest areas to reduce pollution, planting new windbreaks for soil protection, planting urban green spaces and roofs, and other solutions to create biodiversity. This second focus point highlights the concepts of multifunctionality and adaptability, contributing to the landscape’s overall resilience. Third, NBS have a governance-based approach to creation and management. Co-design, co-creation, and co-management are advocated and are a part of taking a step away from the traditional top-down conversation to finding solutions that match the needs of a diverse range of stakeholders. The last point points out NBS as action-oriented. Using an action-oriented approach is a part of linking policy with action on-site (Pauleit et al., 2017).

NBS is a concept to address climate change on multiple scales (IUCN, n.d.). The Global Goals (n.d.) describes the importance of acting now to avoid enormous crises in the coming years. Addressing these problems is a way of trying to restore and promote sustainable use of our ecosystems, but also a part of ensuring the survival of humans (Global Goals, n.d.). Naturvårdsverket (2022) describes that because of NBS’s concept, several goals will be reached when using them. Using NBS as a concept, there are primarily three problems that are addressed:

> ”1. Decrease greenhouse gas emissions related to deforestation and land use
> 2. Capture and store carbon dioxide from the atmosphere
> Enhance resilience of ecosystems, and as such support societies to adapt to
> 3. climate hazards such as flooding, sea-level rise, and more frequent and intense droughts, floods, heatwaves, and wildfires (IUCN, n.d., About Nature-Based Solutions for climate). ”

One key is to change the residents’ perspective and view of nature. Frantzeskaki (2019) presents that NBS are a part of creating new green urban commons that lead to new social connections between the citizens and their view of nature. The Global Goals (n.d) also points out the importance of education, innovation, and awareness in reducing the impacts of climate change. The concept of urban green commons focuses on the importance of benefitting the whole community regarding future management (Frantzeskaki, 2019).

If NBS is implemented correctly and carefully in urban areas, it should be considered a part of the solution that contributes to socially inclusive urban development. Using NBS in urban green projects can involve local communities if motivation and interest are acquired. Urban gardening, community ownership, and reassuring that the local needs will be satisfied could reassure the community that NBS contributes to the solutions for better social sustainability and increase their motivation. All groups in the restoration of underutilized urban spaces are encouraged in the NBS concept because exposed areas without any relatedness to the community become vibrant spaces, including all community members (Emilsson & Ode Sang, 2017).

NBS recognizes several benefits, but as the concept is overtaken in broader discussions and debates in global, national, and local policy processes, concerns about the concept are getting more attention. UN (2022) explains four concerns connected to the concept - that NBS could infringe on the actor’s rights, it could change focus from other urgently needed actions, the term could be misinterpreted and misused, and there is skepticism about NBS effectiveness. In this discussion, it is important to remember that NBS is solution-orientated and reflects one way to address various social, economic, and environmental challenges. Implementing the concept in a design should address a specific problem rather than assuming that working with nature automatically provides impact or benefits (UN, 2022).

1.5 Methods

We used a qualitative mixed-methods approach to answer our research questions, combining social scientific and designerly tools: literary study, travelling transect, semi-structured interviews, and action research.

1.5.1 Literature study

We conducted a literature study to better understand the geographical, ecological and social context within the field by identifying other researcher's existing knowledge and findings connected to the Reconquista river area. The literature studies are based on previous MFS-related papers from databases Epsilon and DiVA portal, SLUs university library services, Google Scholar, and recommended documentation from Municipality of San Martín and DISU to understand how blue-green infrastructure looks like in the Reconquista river area and how the municipality work together with residents to improve and maintain the public spaces. Relevant keywords for searching have been: ”Buenos Aires,” ”Reconquista River,” ”Public spaces,” ”Blue-green infrastructure,” and ”Women's rights.”

1.5.2 Travelling transect

For conducting the field study we used the travelling transect method described by Diedrich and Lee (2024). This approach is grounded in Alexander von Humboldt's transareal methodology, which emphasizes the importance of embodied actions. The aim is to employ the travelling transect as a research tool to deepen our understanding of landscapes, capture site-specific qualities, and raise awareness of the environmental and cultural issues associated with landscape fragility (Diedrich & Lee, 2024). To better understand the complexities of landscapes and underscore the significance of material and immaterial factors influencing design and creation, a travelling transect was conceived in three steps: pre-travel study and definition of the itinerary, on-site travel with the possibility to deviate from the preconceived travel line, post-travel evaluation and interpretation of site findings. A cartographic diary allowed us to amass the geolocate site findings, and a tableau physique was used to communicate the synthesis of the findings in the context of our research questions (Diedrich & Lee, 2019).

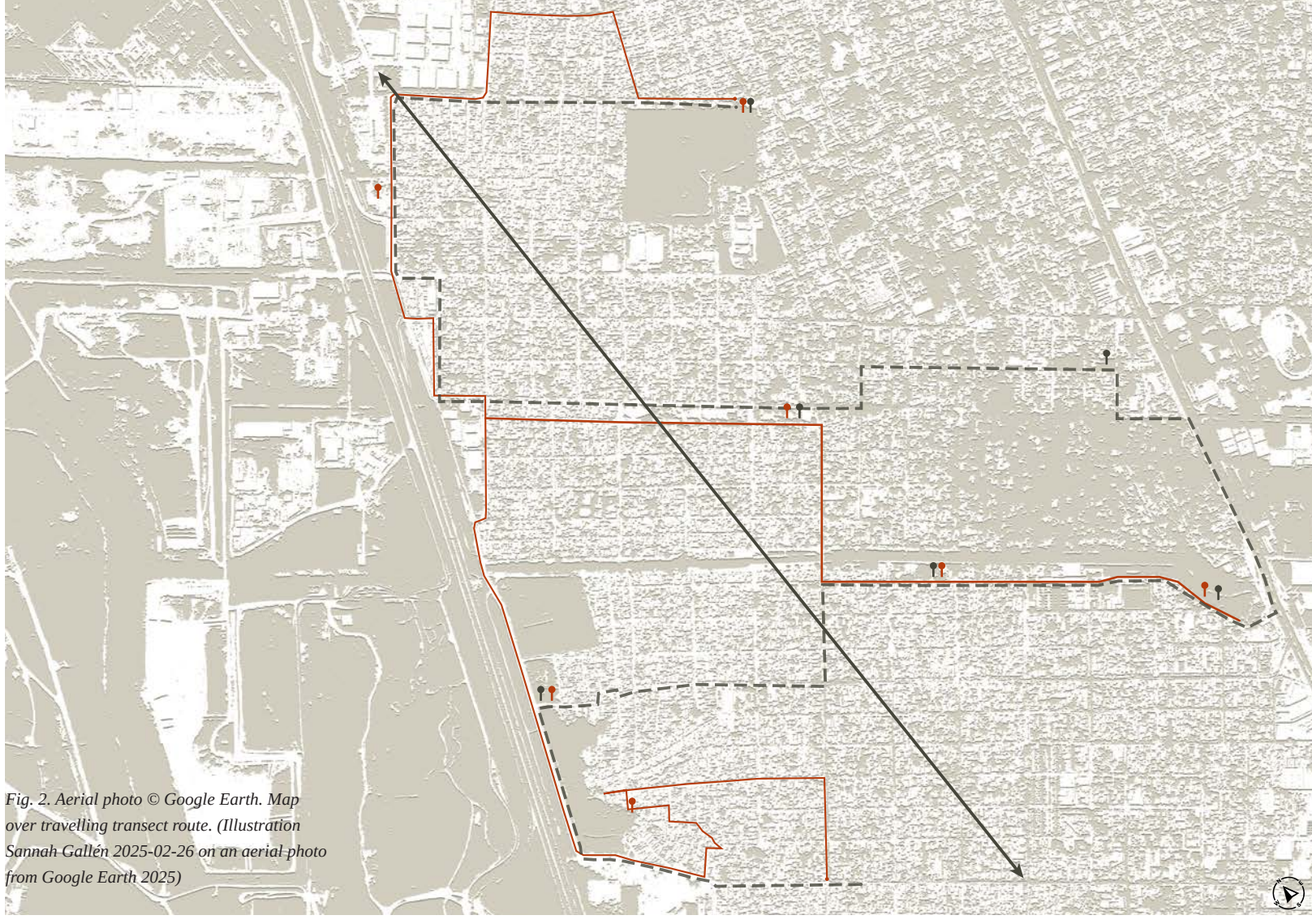


Fig. 2. Aerial photo © Google Earth. Map over travelling transect route. (Illustration Sannah Gallén 2025-02-26 on an aerial photo from Google Earth 2025)

Pre-travel, we identified a path, the dashed line, to follow during our transect. To define a route that includes sites where we can expect to discover various qualities and conflicts on territorial and micro scales, we researched previous literature that describes the current environmental and social situation along the Reconquista river basin (Diedrich & Lee, 2019). Janches (2012) describes the overall picture of Buenos Aires as a fragmented city, and Álvarez Rodríguez (2010) contributes with an overall picture of the current state around the middle basin of the Reconquista River. The social aspects around the river, with an emphasis on women, are well presented by Gavazzo and Nejamkis (2022). Documents and an analysis that the Municipality of San Martín has already completed have helped us identify places that have benefited and could benefit from urban development.

While on-site, people from DISU accompanied us. The site visits were conducted in segments between January and March 2025 at different times throughout the day. The gathered data, in the form of pictures, notes, sketches, profiles, and discussions between us, constitutes our cartographic diary, the third step of the travelling transect.

Post-travel, the intention is to convert the cartographic diary into a tableau physique, as described by Diedrich and Lee (2024). Our tableau physique was designed to communicate our research results to audiences as diverse as the DISU unit at San Martín and other landscape architectural researchers at SLU and in Sweden. The professionals at DISU will be particularly interested in the concrete design recommendations depicted through the tableau physique. In contrast, the academic community will be offered a striking example of a designer tool synthesizing fieldwork findings in text and image.

1.5.3 Interviews

The research includes interviews to understand the municipality's perspective and how they work towards addressing ecological and social problems rather than finding concrete solutions. Their insights are also a valuable complement to our findings on-site since they mutually integrate with the neighbors, and we get more of an observation perspective. Interviews were conducted with individuals from the DISU board. Individuals interviewed are chosen with help from the municipality to cover a diverse range of perspectives.

The interviews were performed using a semi-structured approach. The quantitative method of semi-structured interviews is based on predefined questions, but there is also a possibility of deviating from the predetermined thematic framework (Leigard, 2023). Before executing the interviews, we defined questions to cover the environmental and social context, reaching for an understanding of the whole development process in the Reconquista river basin. Using semi-structured interviews gave us more open-ended answers, allowing us to search for patterns and comparisons between respondents. The answers we get also guide us in our future research by establishing a more solid knowledge base (George, 2023a).

The interviews were performed at the Municipality of San Martín, allowing interaction between us and the individuals interviewed. This also gives extra possibilities to catch and process nonverbal signals, adding insights about feelings and perceptions (Leigard, 2023). Four interviews were made, lasting about 10-20 minutes. For the interviews, we had the opportunity to interview people working at the Municipality: one landscape architect, the general director of urban planning, the undersecretary of infrastructure, and the director of social and urban integration.

Before the interviews, a short introduction of our thesis was explained to the individuals being interviewed, and it was made clear if the person being interviewed knew or had worked with public spaces in the Reconquista river area before. Adams (2015) describes the possibility of modifying the predefined questions depending on the person being interviewed and the setting. We used this approach and presented the question from an angle focusing on General San Martín and Buenos Aires or connected explicitly to two sites. Which perspectives were presented for whom was decided depending on the individual pre-knowledge about the two specific sites. Two interviews were conducted in English, one in Spanish, and one in which a mix of English and Spanish was used. For the Spanish one, a translator was a part of the interview. The interviews were voice recorded to ensure our full engagement could be focused on the discussion. After the interviews, the answers were transcribed and presented in an appendix.

1.5.4 Action research

Taking a step back and looking at the periphery, despite significant social and environmental challenges, the ability to self-generate offers the possibility of regenerating them into the formal structure of the city (Janches, 2012). Trying to understand the context of the periphery and the social perspective we are surrounded by during our research, we used the method action research. Action research was used on-site, for example in the San Martín Planta project. Our choice to integrate into the project is a part of creating a better understanding of how the local communities work in marginalized areas, how the communities are integrated into the urban development process, and getting a hands-on perspective on how DISU engages residents to improve the public spaces.

This way of researching is called action research. Action research is a term developed parallel in two independent places. Kurt Lewin first introduced the term in the 1940s, and at the same time, the term was created in Britain connected to the Second World War. The ideas differed from each other, but in common, they had the social engagement of social science and how they referred to it as a strategy for implementing social science to solve essential social problems (Susman & Evered, 2012). Action research is a form of comparative research concentrating on planned social interventions that led to social transformations (Janches, 2012).

Several definitions of action research have been presented. One of them is given by Applied Doctoral Center (2025) and summarizes the emphasis of the method well:

> “Action research brings together action and reflection, as well as theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern” (Applied Doctoral Center, 2025, What is Action Research?)

Another well-quoted definition of action research is Rapport’s definition from the 1970s presented by Susman and Evered (2012):

> “Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework (Susman & Evered, 2012, p. 587).”

In developing the marginalized areas, participatory observations or action research allows the researcher to access local knowledge, which is key to enhancing the project’s impact and sustainability. Fundamental methodological concepts of action research have been applied in marginalized areas of Buenos Aires in several projects with different purposes. One primary purpose was to integrate and empower marginalized areas by establishing new hubs for urban, economic, social, political, and environmental growth by micro-development of spaces with multi-purpose (Janches, 2012).

Action research is often described as a cyclical process that includes several steps (Susman & Evered, 2012). On-site four steps, included in the repetitive cycle that action research describes - planning, action, analysis, and conclusion, guided us. An important part of the cyclical process is to bridge the gap between theory and practice and highly value reflection (George, 2023b).

We have chosen this method since it is a highly adaptable method that allows us to shape our analysis based on the needs we recognize while on site, for example attending San Martín Plantas events such as plantings, meetings and inaugurations. George (2023b) also presents the process as beneficial due to its immediate problem-solving and improvement of existing systems rather than concluding data, advancing existing knowledge, and providing generalizable and reliable findings, as the purpose of traditional research often is. Something that helped us understand the community and individual’s view of public spaces in their neighborhood and how it could be changed practically rather than statistically. Janches (2012) also describes that approaching the problems through action research enables the architectural project to materialize or represent the values within the community’s experience. These insights are valuable for us as landscape architect students to bring into future urban design projects.

2. Geographical and social context

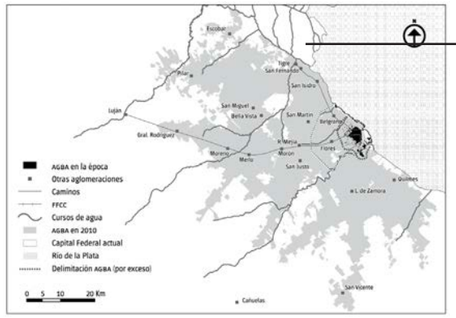
This chapter explains how the growth of Buenos Aires has shaped its current state and the complex interplay between urban growth and environmental sustainability in Buenos Aires, Reconquista river basin, and Middle basin, San Martín. We investigate the city’s social-spatial dynamics, highlihting its urbanization and the challenges it faces, including socio-economic segregation, environmental degradation, and the impacts of climate change. We examined the significance of green-blue infrastructure and the historical development of public spaces, emphasizing their importance for social interaction and cultural expression.

2.1 Buenos Aires

By 2018, about 92% of Argentina's population lived in urban areas, predominating the Metropolitan area of Buenos Aires (UN-HABITAT, n.d.c). The Buenos Aires Metropolitan Area (AMBA) covers the Autonomous City of Buenos Aires (CABA) and surrounding municipalities in the Province of Buenos Aires (Gonzalez, 2021).

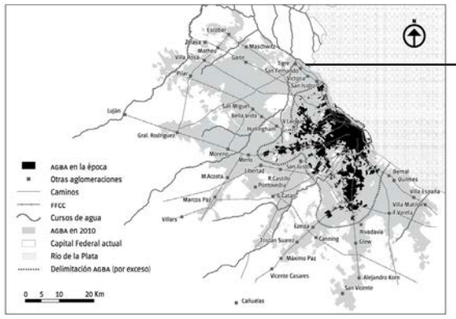
Between 1870 and 1930, a radial monocentric structure surrounding the capital was established, and the AMBA began to form an expansion driven by distinct suburbanization processes. In line with the expansion of transport systems, the coming 30 years contributed to creating marginalized settlements along the southern railway lines (Gonzalez, 2021).

Due to urban growth in AMBA, there is distinct socio-spatial segregation and urban issues, resulting in a fragmented city. The fragmentation is a result of various socio-economic components, which primarily began with the economic crisis of the early 2000s, which was marked by high unemployment and income disparity. Buenos Aires is a city that reflects the complex blend of social relations, economic inequalities, and conflicting attempts to fit into and be accepted by the urban setting (Janches, 2012).



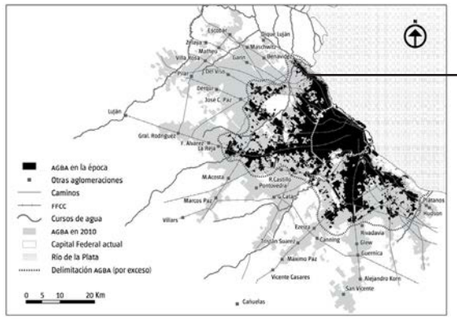
Buenos Aires, 1870

The railway construction in 1850 had begun to prefigure the radial structure of the incipient metropolis, but at this time, the development was influenced by high immigration. Foreign immigrants prioritized the already consolidated areas located in the central areas (Rodríguez & Kozak, 2014).



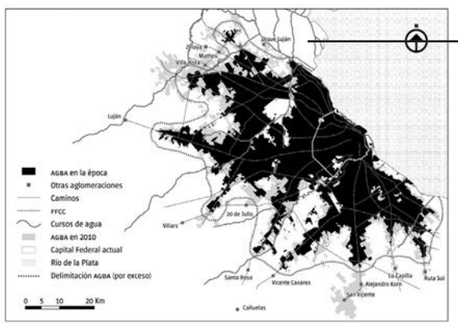
Buenos Aires, 1910

At this time, the suburbs were seen as frontiers for industries. The periphery became marked by industries surrounded by working-class urban centers. Migrants settled in the suburbs of the periphery, and now, the territory outside the city has started to become close to the city (Gómez Pintus, 2015).



Buenos Aires, 1948

The physical and demographic expansion occurred outside Buenos Aires. Immigration slowed down in preceding decades but is still one of the constituted pillars that underpinned demographic growth (Rodríguez & Kozak, 2014).



Buenos Aires, 1970

Political changes inspired by neoliberal principles foster an economic restructuring, and the city expands in all directions Buenos Aires (Pírez, 2002). Migration still impacts the cities, and at this time, they almost always settle in the suburbs of the periphery. Something that could be seen as the basis of a close functional relationship between the central city and the suburbs (Gómez Pintus, 2015).

Fig. 3-6 . Map of Buenos Aires historical development © Rodriguez and Kozak 2014.

Fig. 7. Aerial photo © Google Earth. CABA today. (Illustration Sannah Gallén 2025-03-26 on an aerial photo from Google Earth 2025)

2.1.1 Green-blue infrastructure in the Metropolitan Area of Buenos Aires

In AMBA, three river systems with their river basins connect with the Rio de la Plata run. These rivers are Matanza-Riachuelo, the Reconquista, and the Luján (Merlinsky, 2016). The city of Buenos Aires experiences some of the most common climate changes; due to its location near the sea and many hydraulic watersheds with a low level of natural water evacuation, the risk of flooding increases, resulting from a warmer climate and a higher volume of annual precipitation (The City of Buenos Aires, 2020). Additionally, urban growth has led to the proliferation of informal settlements often located along the rivers. The lack of waste management and sanitation practices in these areas negatively impacts the environment, as waste frequently ends up in the rivers (Fischer, 2024).

Looking at the green infrastructure, Buenos Aires has three urban reserves and 1,139 green spaces covering about 1,800 hectares (The City of Buenos Aires, 2020). The three urban reserves, Costanera Sur, Lugano Lake, and Costanera Norte-Ciudad Universitaria were developed to protect nature and improve the city's climate resilience, considered the most biodiverse spaces in Buenos Aires (Turismo Buenos Aires, n.d.a).

Parks, streets, sidewalks, marketplaces, connecting footpaths, edge spaces between buildings or roadsides, the list of public spaces is long. UN-HABITAT (2018) defines public spaces as "Multi-functional areas for social interaction, economic exchange, and cultural expression among a wide diversity of people" (UN-HABITAT, 2018, p.5). The public spaces in Buenos Aires have a history that draws back to 1580, when the first public space, Plaza Mayor, was created. Later in history, public spaces developed as a result of public occupation. The occupied land was originally a peri-urban area or empty lots of the municipality (Celis, Eguia & Persico, 2011).

Green spaces started to be involved in planning urban areas, creating public spaces as parks. Influences from French and English landscaping models where green spaces improve health became the reason for Latin American cities to enhance their small plazas between blocks into extensive parks, which now plays a central role in social integration (UN-HABITAT, 2018).

Rising temperatures and heat waves are also effects of a changing climate. In the last 60 years, the average temperature has increased by 1.7 degrees Celsius. Due to this, heat waves are a phenomenon that occurs more often in the AMBA, and the tendency is continuing to increase. Not only are they increasing, but the duration is also getting longer, which is the biggest concern. AMBA also faces the challenge of urban heat islands, caused by a large concentration of buildings, pavements, transport, and lower wind speed that decreases heat loss (The City of Buenos Aires, 2020).

Photo of Costanera Sur Ecological Reserve.

2.2 Reconquista River Basin

Reconquista river basin is divided into three basins, upper, middle and lower, see figure 12, (Vignale et al. 2022). It is part of Greater La Plata and is home to 4 million inhabitants throughout the Metropolitan Region of Buenos Aires. Greater La Plata has several hydrographic basins perpendicular to Rio de La Plata (Álvarez Rodríguez, 2010). Presently, the Reconquista River is the second most contaminated river in Argentina. The leading causes of contamination are the discharges of sewage and industrial effluents with deficient or no treatment (Nader, Sanchez Proano & Cicerone, 2013).

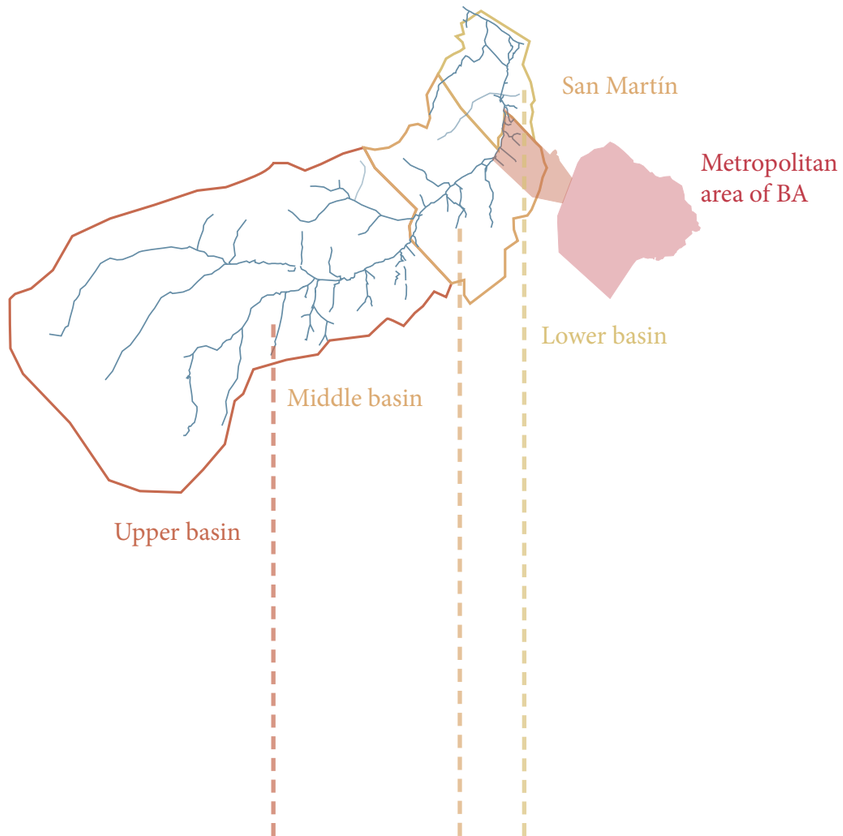
Àlvarez Rodríguez (2010) describes a structural methodological sequence consisting of environmental structure, urban structure, green spaces, and social structure. The environmental structure is used to describe all the layers around the Reconquista river basin. Reconquista is a river basin typical of those in a plain landscape (Álvarez Rodríguez, 2010).

The urban structure surrounding the river basin reveals its evolution and transformations while incorporating various features. Álvarez Rodríguez (2010) states that the river and its floodplain act as a natural division within the delineated region of the basin. However, there was always a tendency to develop the city right to the water's edge, leading to a complexity of built-up and natural landscapes.

Álvarez Rodríguez (2010) uses green spaces to discuss the current state in the river basin. The square meters of green and public spaces only reaches 3.2 m^2/inhabitant, which is lower than the local legislation requiring 10 m^2/inhabitant. This low coverage and the challenges presented under the environmental structure make it possible to point out qualitative deficiencies in the existing green spaces (Álvarez Rodríguez, 2010).

The social structure is complex in this area. The banks of the river have become backyards of riverside municipalities and are challenging to describe because they lack accessibility and visibility. The area, which reaches nearly 70,000 hectares, acts similarly to the edges of the metropolitan periphery, reflecting population growth (Álvarez Rodríguez, 2010).

In recent years, two entities that have survived the political changes in Argentina, COMERIC, and CEASME, have been working to improve the region's development (López Sardi, 2019). The Reconquista River Basin Committee, COMIREC, coordinates and implements actions focused on sanitation, water resource conservation, and enhancing the quality of life for residents of the Reconquista river basin. The autarchic entity has the legal authority to plan, coordinate, implement, and oversee the comprehensive management of the river basin (COMERIC, n.d). Coordinación Ecológica Área Metropolitana Sociedad del Estado, CEAMSE, is a company established by the Province of Buenos Aires and the Autonomous City of Buenos Aires. They aim to manage urban solid waste and develop and conserve green and blue spaces (CEAMSE, n.d).



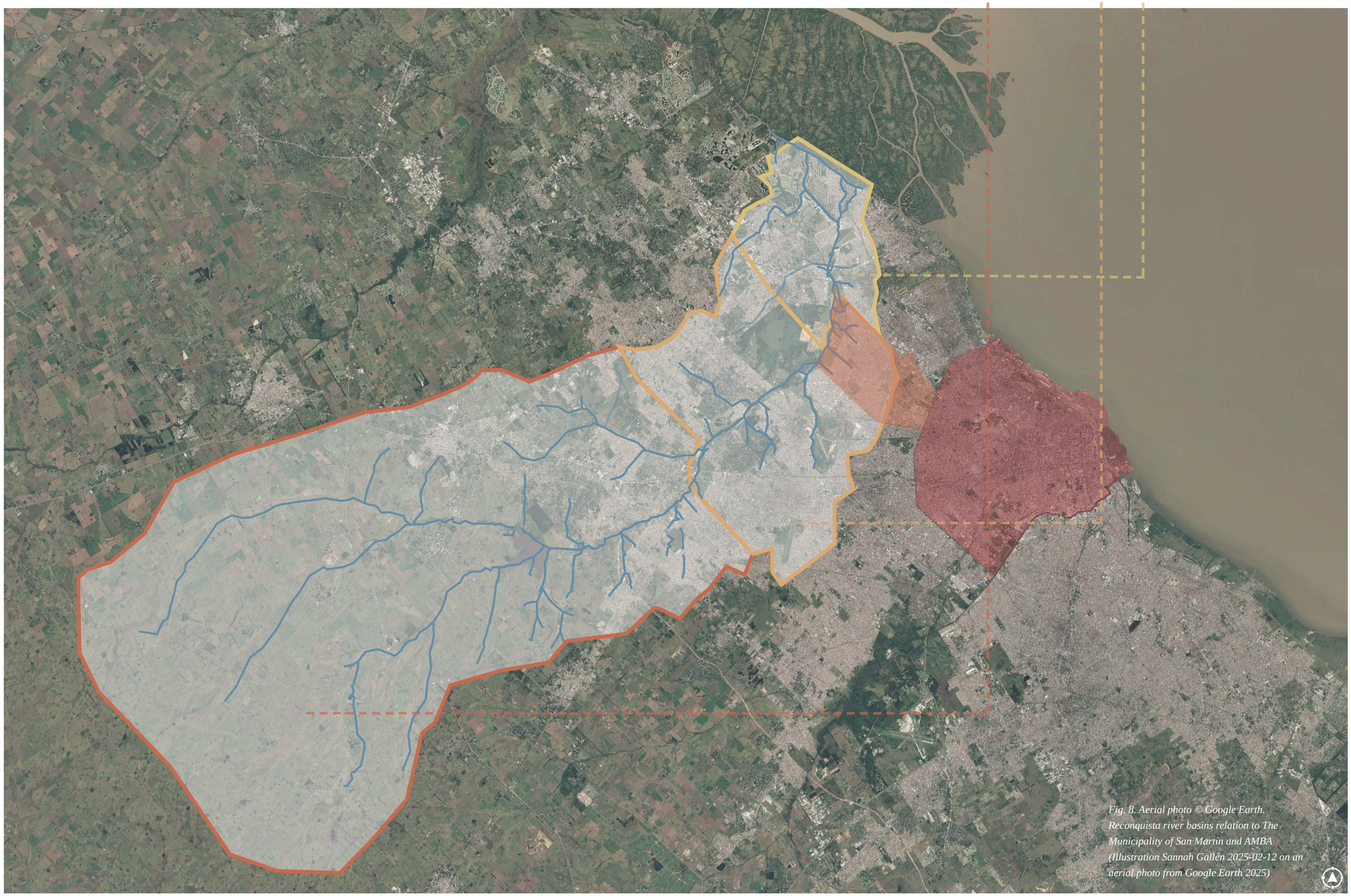


Fig. 8. Aerial photo © Google Earth. Reconquista river basins relation to The Municipality of San Martín and AMBA (Illustration Sannah Gallén 2025-02-12 on an aerial photo from Google Earth 2025)

Fig. 9. Aerial photo © Google Earth. Zoom in at the Reconquista River's middle basin. Area for thesis work in relation to the Reconquista River. (Illustration Sannah Gallén 2025-02-12 on an aerial photo from Google Earth 2025)

2.3 Middle Basin

The middle basin is a densely populated area where the Reconquista River has the characteristics of an urban river (Nader, Sanchez Proano & Cicerone, 2013). Historically, the river basin has suffered the consequences of flooding, something that is increased since the 1940s due to the even more intense occupation of land. With a predicted future sea level rise, the Reconquista River will be one of the basins most affected since it is one of the lower ones (Merlinsky, 2016). Aside from flooding and high population, the area has been heavily impacted by the improper disposal of solid waste in open-air dumps, indiscriminate extraction of groundwater, and the uncontrolled discharge of untreated domestic and industrial effluents (Álvarez Rodríguez, 2010).

In the middle basin, the Municipality of San Martín is located. San Martín has a history that draws back to the middle of the 1850s when there were industrial establishments, and the District of San Martín was created as a response to the town's rapid expansion (LNW, 2012). Since the confirmation, the town has grown into a major industrial center (Britannica, n.d.).

The continuing development of the Municipality of San Martín is closely related to the economic, political, and social changes that took place during the 1930s (Paredes, 2010). Today, the municipality belongs to the second ring of municipalities in the province of Buenos Aires (Pírez, 2002). The district is characterized by industrial confirmation, which has led it to be called the "Capital of Industry" and is almost entirely urbanized (Centro de Economía Regional, 2012).

The General of San Martín holds 27 localities and is the most populous municipality within the area (Observatorio Metropolitano, n.d). It is also one of the northwest municipalities with the most land occupied by informal settlements. The settlements were developed during different stages, and today, they are primarily located close to factories and at the Reconquista river bank. Settlements on the riverbank suffer today's consequences from flooding, degradation, and environmental pollution caused by their proximity to landfills, creating a vulnerable living situation for the residents (Paredes, 2010).

The significant environmental challenges San Martín faces are connected to water management and a densely built environment. About one-third of the district is located on land that is characterized to be impermeable, which reduces water retention and increases flood risk (Konijnendijk et al., 2024). San Martín has about 50 green public spaces in its neighborhoods (San Martín, n.d.c). However, the amount of green infrastructure and insufficient stormwater drainage worsens the risk of floods and intensifies the phenomena of urban heat islands (Konijnendijk et al., 2024).

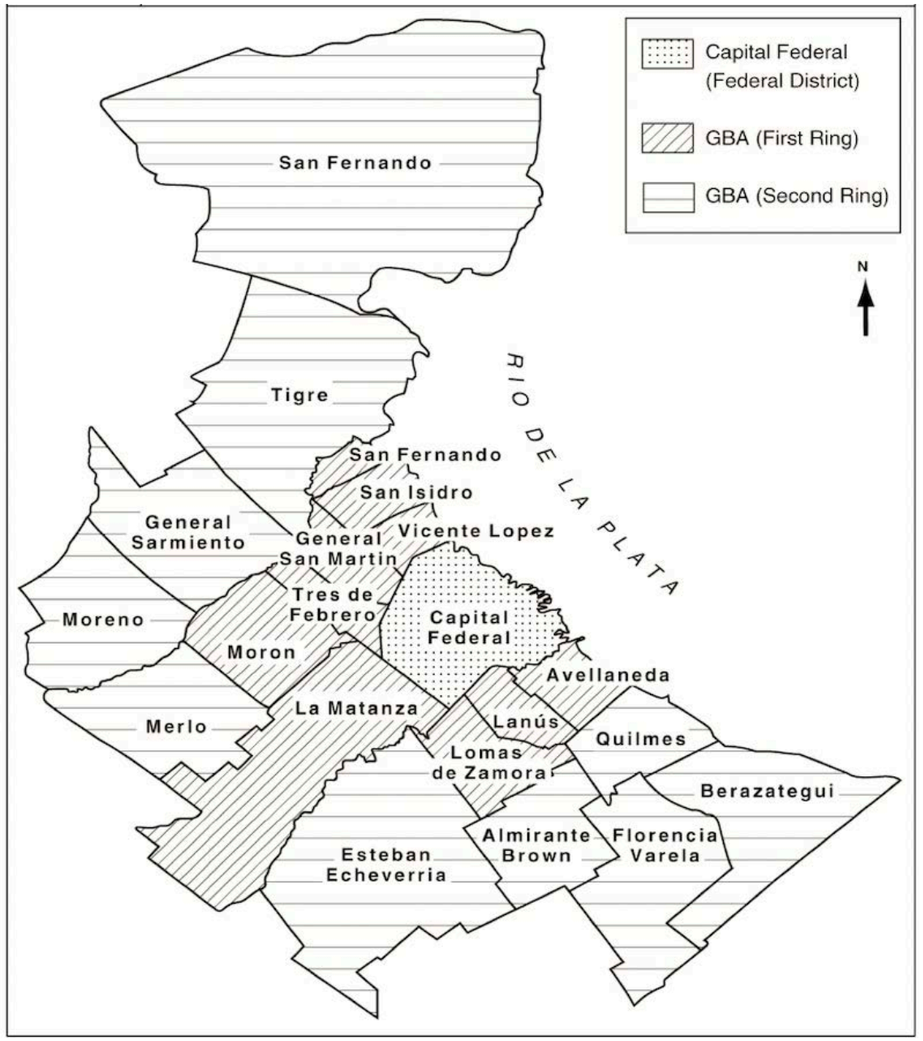


Fig. 10. Map of the Metropolitan area of Buenos Aires and the first and second ring of municipalities 1991© Pírez 2002

2.3.2 San Martín Planta

San Martín Planta is an ongoing program initiated by the Municipality of San Martín. It is one way they have decided to work towards creating a more ecological and socially sustainable environment for the residents. The program aims to plant 7,500 native trees annually in the municipality's public green spaces and initiate co-creation while developing or creating new green urban public places. The San Martín municipality (n.d.d) says, "The proposal promotes environmental education and community participation in the intervention of public space" (San Martín, first page, n.d.).

The community is a big part of social sustainability. Integrating the community in the process includes education, with formal and non-formal education spaces and community spaces, including students at schools. Education is used to change the perspective of green areas and learn about the benefits of green infrastructure and the use of native plants. The idea is to create a network of nurseries throughout the city to produce and care for the native species (San Martín, n.d.d).

Native species could be described as plants that developed in a specific region over time, becoming well-suited to the resources and conditions of the local ecosystem where they thrive. They are a part of the reconstruction fragments of the original landscape that human activity affects (Ministro de Ambiente, 2023). The Municipality of San Martín has chosen to use native species because their roots are strongly related to the culture and because of their ecological values. Native species are better adapted to soil conditions, more resistant, require less care, and will maintain the natural order by interacting with species of flora and fauna, reinforcing biodiversity (San Martín, n.d.b).

San Martín Planta has projects all around the municipality, and we have been integrating on sites located in neighborhoods with diverse population density and social and economic status and in neighborhoods where the quality of the existing green infrastructure differs, which has also contributed to our overall understanding of the area we are researching. Participating in the project included planting plants developed in nearby nurseries on sites pointed out for development by the Municipality of San Martín and contributing with our knowledge on which plants suit best where.

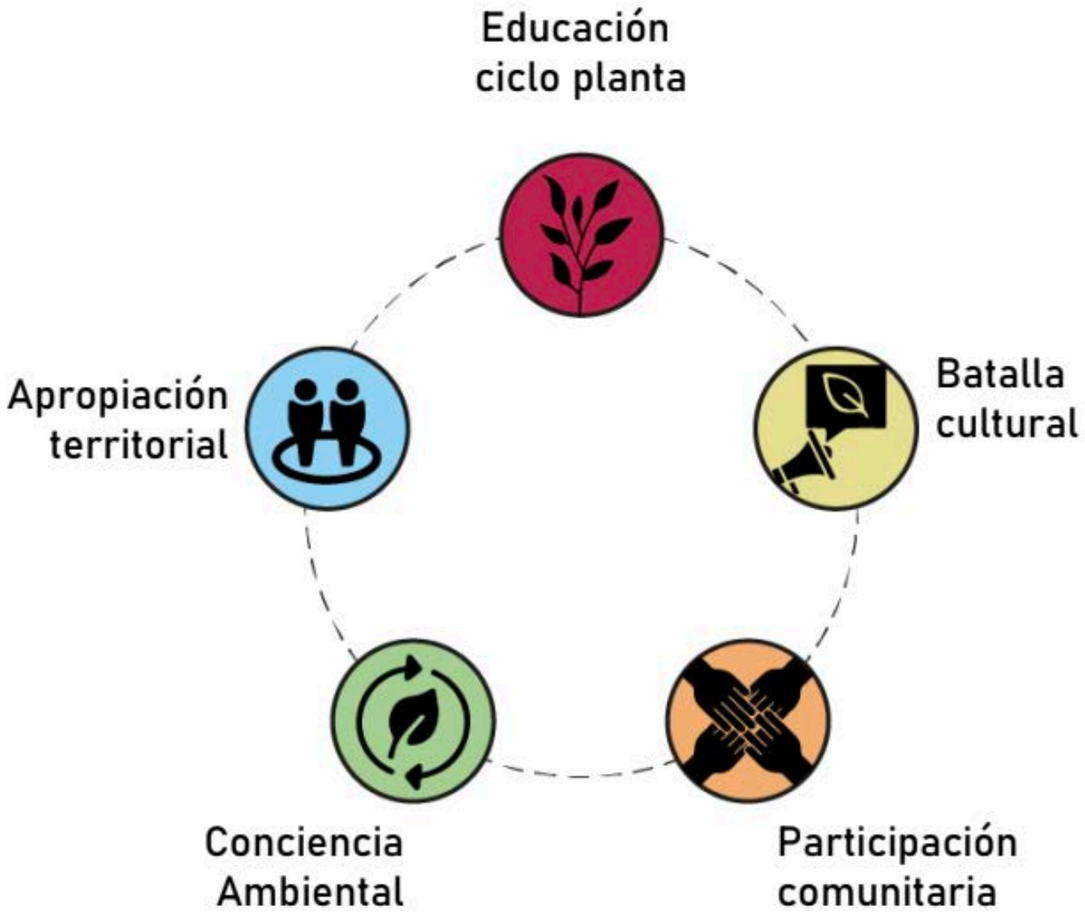


Fig. 11. DISU's work process within the San Martín Planta project © San Martín n.d. It involves plant cycle education, territorial appropriation, environmental awareness, community participation and cultural battle.

The native plants presented below are examples of species suitable for a wetland and an urban forest. We have chosen these species based on information from Catalogo de Nativas Bonaerenses (Ministerio de Ambiente, 2023) and DISU. The species will be implemented in our recommendations for future development for two sites investigated during the travelling transect.

Erythrina crista-galli - Ceibo, seibo
National flower of Argentina. Suits well in urban parks, close to water mirrors and tolerates contaminated soil.

Salix humboldtiana - Sauce criollo
Large-scale tree found in parks, on the edge of water mirrors, in streets and avenues. High ecological value for birdlife.

Pavonia sepium - Malvavisco, botón de oro
Bush that stands out for its yellow flowers. Benifits pollinating insects.

Typha latifolia - Totora, Espadaña
Grows in shallow water and reach a height of 1-2 meters.

Salvia guaranitica - Salvia azul
Large blue Salvia, often placed in flowerbeds and near bodies of water. It has a long flowering season and an ability to cover big areas.

Commelina erecta - Flor de Santa Lucia
Used as a floweing lawn in gardens and urban parks. Seeds a lot.

Sesbania punicea - Ceibillo, acacia mansa
Suits well in parks and public gardens. Stands out for its foliage and orange-red flowers.

Enterolobium contortisiliquum - Timbó
Large-scale tree suiting in public space and wide streets. A long flowering season and then fruiting.

Senna corymbosa - Sen de campo
Bush with high ecological value for butterflies. Stands out for its yellow flowers and long flowering season.

Oenothera affinis - Suspiros
Often used as an ornamental in urban parks, gardens, on embank ments and railways. Flowering in yellow during the night.

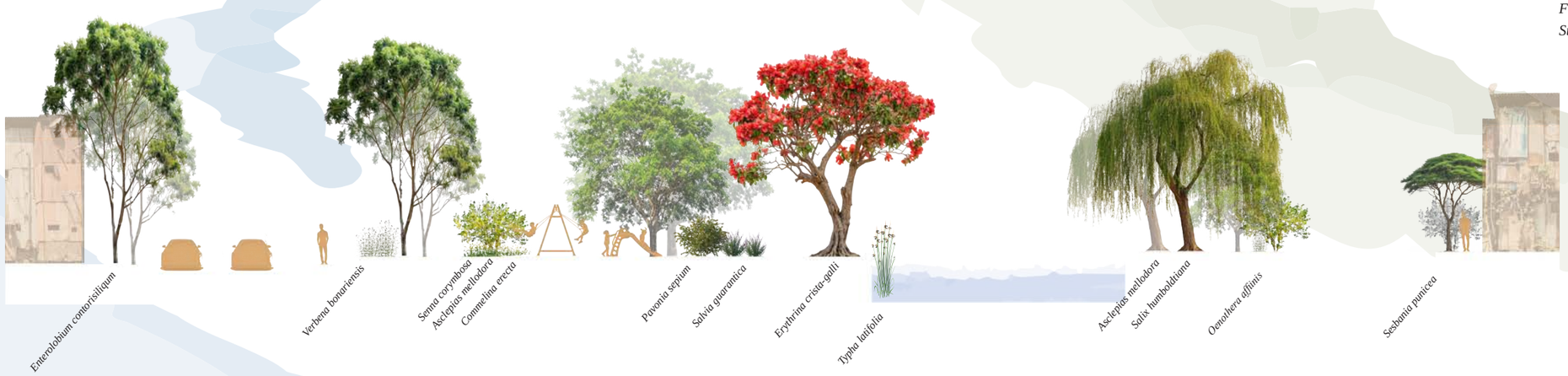
Passiflora caerulea - Mburucuyá, pasionaria
Has a high esthetic value with its white and blue flowers and fruits. plant holds several ecological benefits for bugs and butterflies.

Araujia sericifera - Tasi
Often used for its white to light pink flowers and nuts and ecolo gical value. It has a long flowering season.

Asclepias mellodora - Yerba de la víborá
Lower herb often seen in urban parks and gardens. Benefits several butterflies.

Verbena bonariensis - Verbena morada
Purple verbena seen in flowerbeds, urban parks and gardens. It has a long flowering season and is low maintenance.

Fig. 12. Photos of native species © Adobe Stock & Catalogo de Nativas Bonaerenses



Section showing the native species in a possible landscape situation.

3. Analysis and Results

In this chapter, we explore our findings from the transect study conducted in the Reconquista river basin, focusing on the current state of public space and its ecological and social sustainability. Key observations from various public spaces and interviews are highlighted. We also provide recommendations for further development, emphasizing possible solutions, community engagement, and improved green infrastructure to address ecological and social issues.

3.1 Site exploration

The site explorations performed in the Reconquista river area, Buenos Aires are possible because of the SIDA's stipend for Minor Field Studies.

While doing observations on-site, participating in meetings and performing interviews, our connections at DISU have been valuable. These connections have made it possible for us to spend a lot of time on-site exploring our area chosen for observation. We have also got the possibility to visit areas perceived as dangerous or unsafe that we on our own would not be able to visit. This has helped us gain more insights about the current social situation and showed the strong local community engagement.

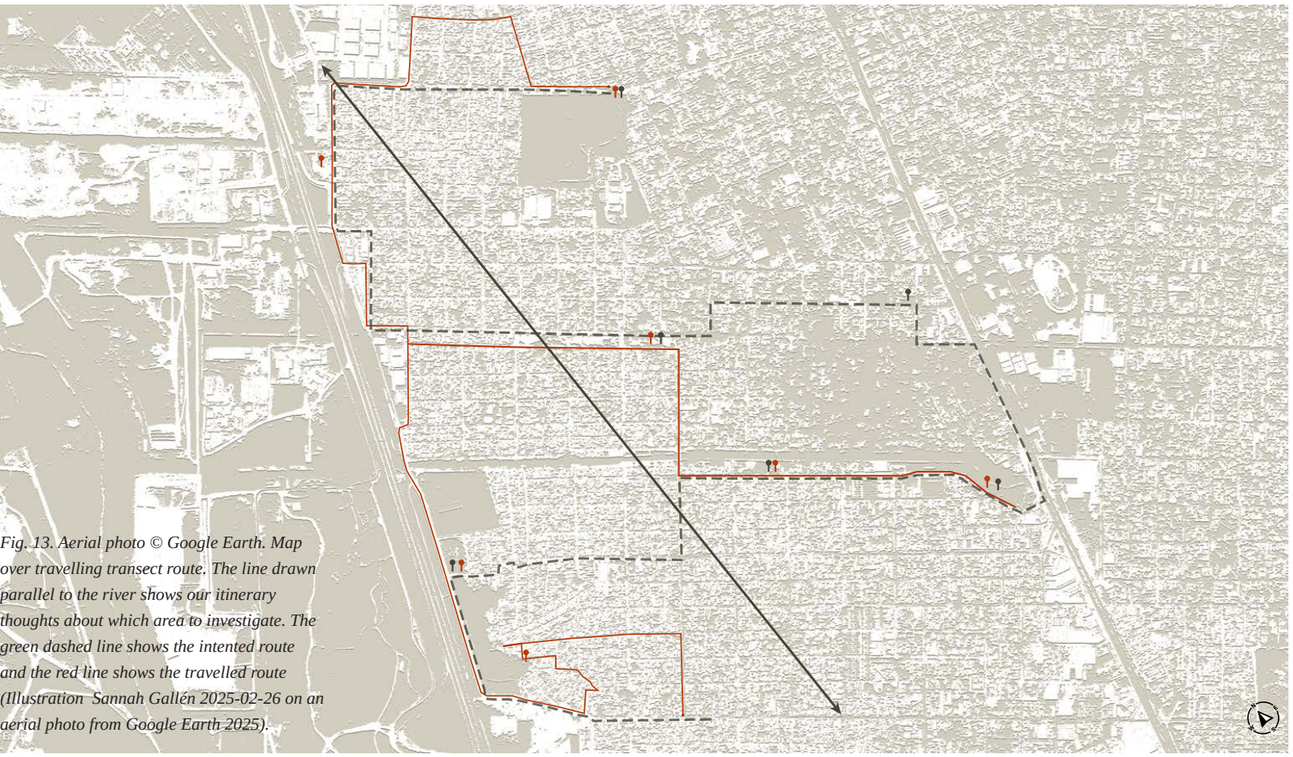


Fig. 13. Aerial photo © Google Earth. Map over travelling transect route. The line drawn parallel to the river shows our itinerary thoughts about which area to investigate. The green dashed line shows the intented route and the red line shows the travelled route (Illustration Sannah Gallén 2025-02-26 on an aerial photo from Google Earth 2025).

Fig. 14. Aerial photo © Google Earth. Map over area for travelling transect. (Illustration Sannah Gallén 2025-02-27 on an aerial photo from Google Earth 2025)

3.1.1. Travelling transect along the Reconquista river basin, San Martín

The travelling transect was conducted on February 3rd & February 21st, 2025

Before executing the travelling transect, pre-studies showed potential interesting and diverse public open spaces in the Reconquista river basin area. While being on-site for the first couple of times with DISU at the San Martín Planta projects, we experienced how public spaces looks and works today, the engagement from the community, how green-blue infrastructure looks today, how vegetation tackle site-specific problems such as high exposure to sun and a lot of waste connected to the current management. We acknowledged that even if the public spaces were located in the same neighborhood, they had their own qualities and challenges. As landscape architect students we found a big interest in understanding and addressing qualities and challenges connected to social and ecological sustainability which led us to some sub-questions to identify which aspects were most intriguing and significant to our research aim.

Ecological

What is the quality of the existing green and blue infrastructure?

Is the existing vegetation providing enough shade or is the public space affected by the sun?

Is the management of waste working in the public space?

Social

Is the public space easily accessible?

Does the public space hold possibilities for recreation? Recreation?

How is the current usage of public space?

Who is in charge of the current management and does it work well?

Parque Lineal Artigas

Plaza Eucaliptus

Plaza 9 De Julio

Plaza Martin Mendoza

Parque Lineal José Ingenieros

Plaza Nicolas II

Laguna El Libertador

Travelled transect line across the neighbourhoods of Costa del Lago, Ocho de Mayo, etc

Intended travel route

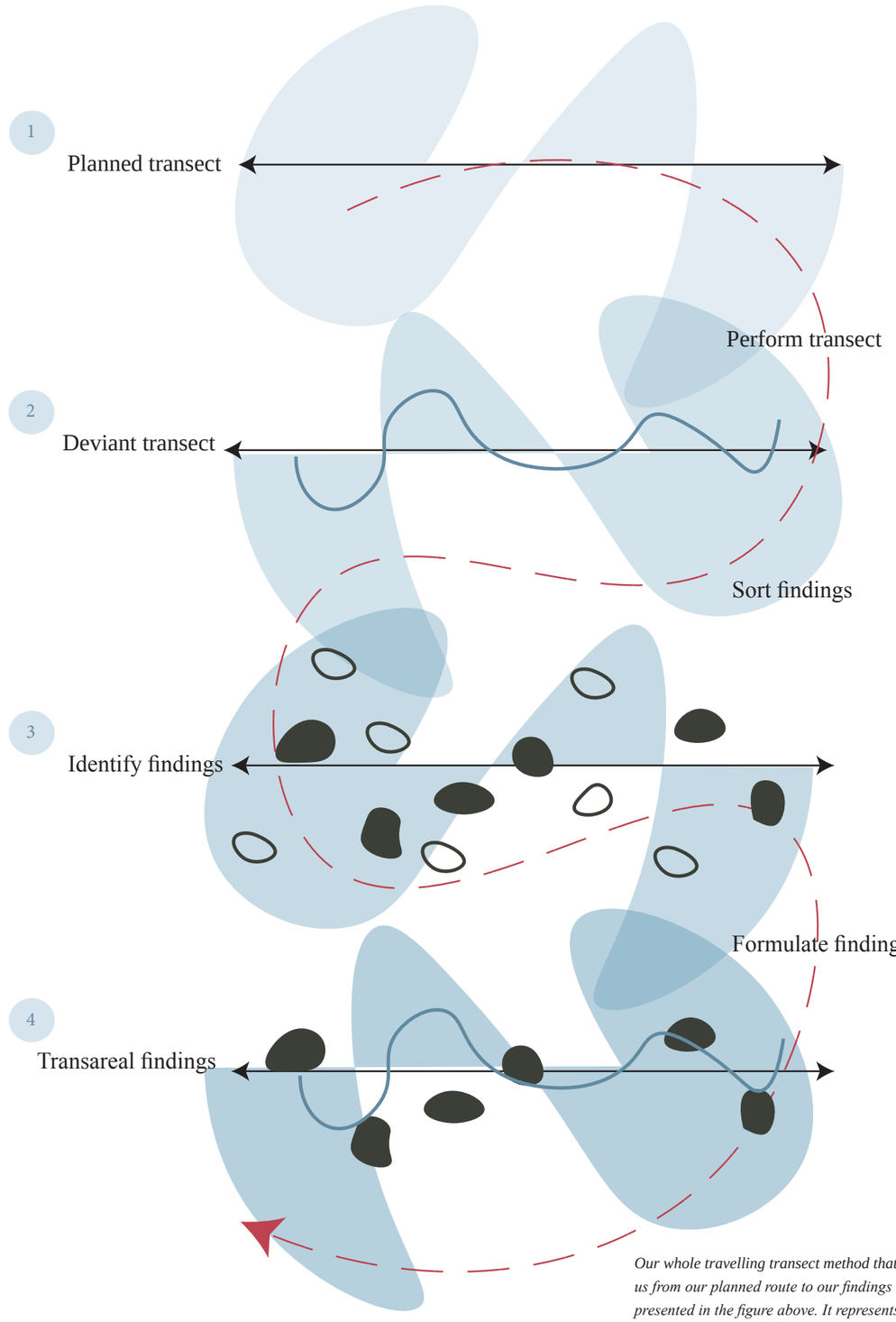
Abstract travelling transect line scoping urban areas along river Reconquista.

Fig. 15. Aerial photo © Google Earth. Map over traveled route travelling transect. (Illustration Sannah Gallén 2025-02-27 on an aerial photo from Google Earth 2025)

The transect traveled around the Reconquista river basin, which is characterized by its diversity and unique features such as different housing, lack of public service, and under-developed public spaces. Our comprehensive transect was drawn parallel to the Reconquista river because we wanted to investigate the urban areas along the river banks from as close as we could. The area along the Reconquista River is interesting for us since neighborhoods are vulnerable to flooding and other climate-related changes. Landfills, slums, topographical hindrances, and other barriers affect the area, and we wanted to understand how these conditions, such as the areas blue, green, and grey, affect the social situation. Gaining insights about this correlation helped us comprehend the community's role in creating and maintaining public spaces and that they always consider this before they work towards future development.

To decide our intended route, we got access to DISU's basis of maps and facts of the area. Based on the maps and aerial photos, we drew a route on the exact streets and chose a couple of spaces we wanted to investigate. We wanted to see spaces with different conditions and challenges where our focuses were the proximity to water to understand which areas are affected by flooding if the public space belongs to an informal or formal settlement, and how the green infrastructure of the space looked, some more in need of more and some with lush greenery. Some of the spaces have already been restored, while others are currently planning for improvement, which could help us see if there are any differences in social and ecological values.

While executing the travelling transect, we made some deviations from our planned route, represented by the red line on our map (see Figure 1). The deviation was mainly made because Guido Fischer Guido, Director of Social and Urban Integration, and Guadalupe Castro, Architect from DISU, wanted to show us public spaces that they thought could interest us for different reasons. Sometimes, it was because of the development of a public space that had been successful, where newly planted vegetation didn't cope well with the heat, where other students had been a part of the community engagement, or because of a site showing good relations between the neighbors and DISU. Choosing not to follow the streets marked from the predefined route was also a part of describing how society works if you are a resident. Showing us the locations for education and schools for different ages, where sports clubs contribute to the community, where industries are located, and how the residents work to upgrade their society. There were also barriers in some cases, making it impossible to go the exact route. As a result, we gained a comprehensive view of the entire area and observed neighborhoods affected by different complexities.



Our whole travelling transect method that led us from our planned route to our findings is presented in the figure above. It represents the complex and non-straight way to gather our insights that led us to our findings.

Monday, February 3rd 2025

Our journey took us through several neighborhoods with population densities, social and economic status, and public services. Some neighborhoods boasted asphalt roads, sidewalks, big trees, waste recycling, and houses with gardens and patios. In contrast, others comprised rough sand roads, tiny alleyways, waste dumps, and teared-down houses, each presenting unique challenges and opportunities.

One unexpected stop was at Plaza Eucaliptus, which was not part of our itinerary. We paused briefly after passing by in our vehicle because Guido believed it would enhance our understanding of the area's complexity and diversity. These experiences added a layer of surprise and intrigue to our journey, enriching our area knowledge.

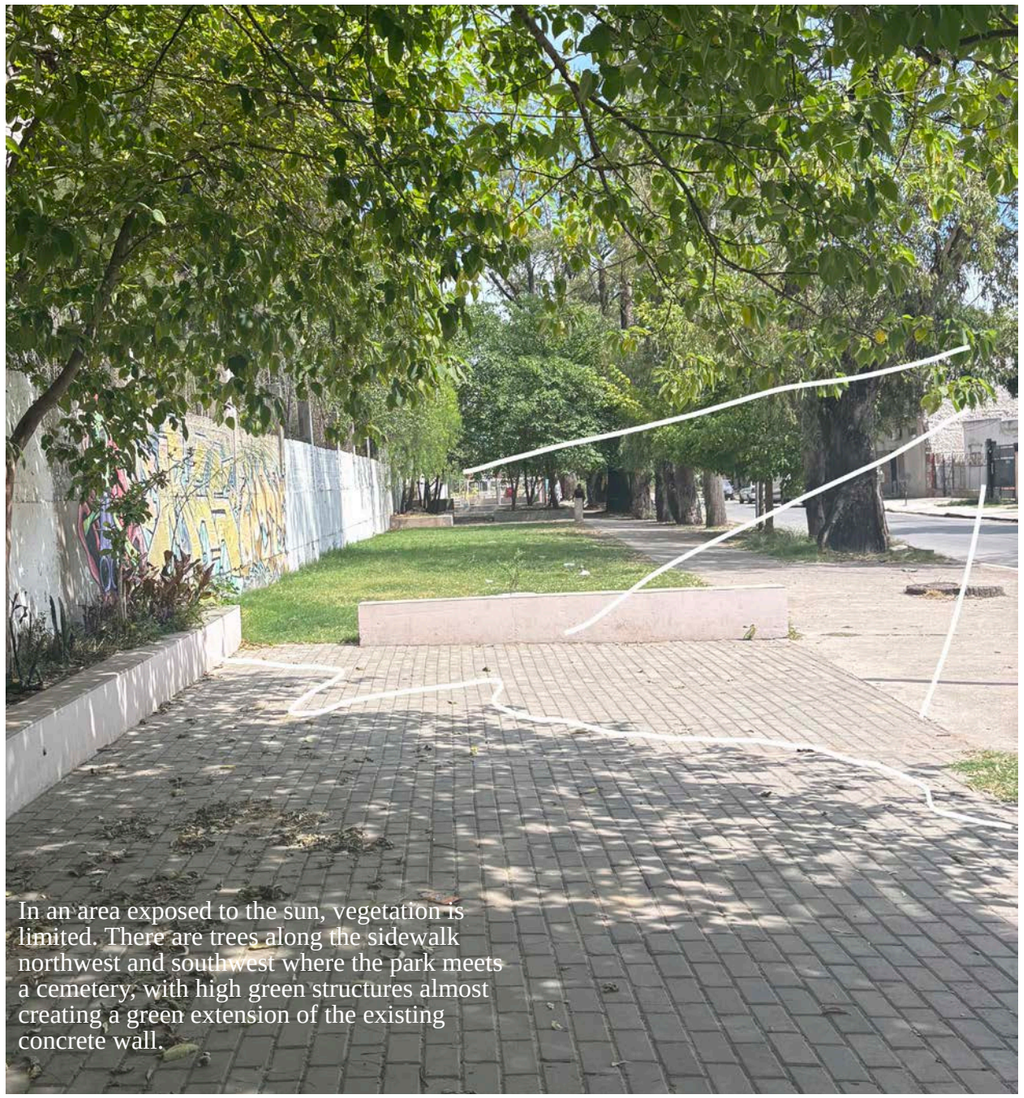
Another unplanned visit took us east of Laguna El Libertador. We drove into an informal settlement where Guido wanted us to see the lagoon from another angle and see a public space up to development. As we traversed the neighborhood, we encountered steep, uneven roads due to its hilly location, which we likely would not have experienced without deviating from our original route. We stopped to gather seeds from a tree and interacted with a local family. A woman from the family asked Guido if she could prune the tree at the end of summer since it grows wider than taller. This interaction revealed the local understanding of the environment, showcasing how residents manage their surroundings. This example highlights a sustainable, hands-on approach to land management, where citizens coexist with nature and actively contribute to its care, offering hope and possibilities for the future.

Most importantly, findings from various sites, Parque Lineal Artigas, Plaza Eucaliptus, Plaza 9 de Julio, Parque Lineal José Ingenieros, and Laguna El Libertador, showed us characteristics such as lush greenery, lack of shade, different sights of how waste is managed, well and less used public spaces and different distances to water. The opportunity to compare these sites enhanced our understanding of the Reconquista river area as a whole and other examples of how difficulties could be solved, or at least strived to, in a similar context and setting.

1

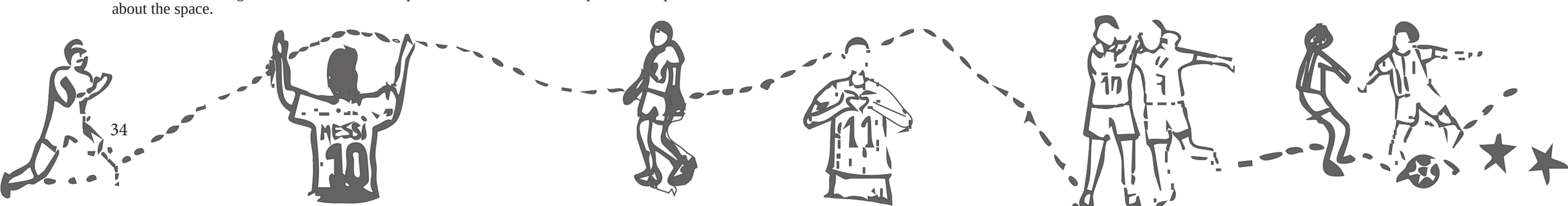
Monday, February 3rd 2025

The trees from the cementary appears as a extension of the wall.



In an area exposed to the sun, vegetation is limited. There are trees along the sidewalk northwest and southwest where the park meets a cemetery, with high green structures almost creating a green extension of the existing concrete wall.

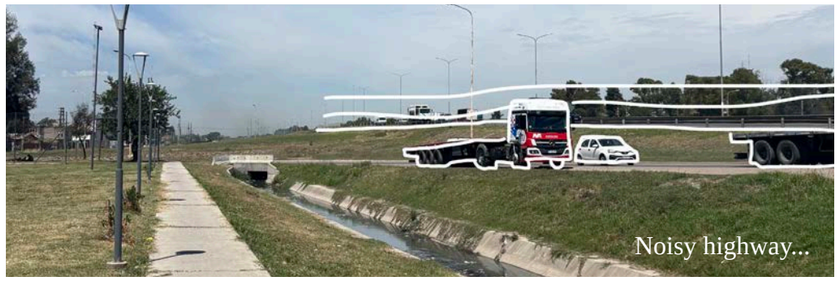
While visiting our first stop, located in the neighborhood of Independencia, we were told that Parque Lineal Artigas was a former place used for dumping waste. Today, the public space features two playgrounds—one with sand and one with rubber flooring—along with a sand soccer field, two multi-purpose courts used for soccer, basketball, and other activities, two barbeques, and two green spaces. The people living across the street also use and maintain the space, seek shadow, drink water from public water taps, and cool themselves down. On-site, some residents recognized Guido and Guadalupe and took the chance to express their opinion about the space.



2 Monday, February 3rd 2025

Our second stop was a deviation from our first planned route. Located on the margin of a neighborhood close to the highway and water channels, we visited the public area Plaza Eucaliptus. The surrounding infrastructure creates a noisy environment and isolates the plaza on three sides.

During our visit, no social interactions happened in the public space. One woman approached Guido to discuss the plaza's future development and raised safety concerns. This interaction highlighted the community's engagement and eagerness to expand the recreational space.



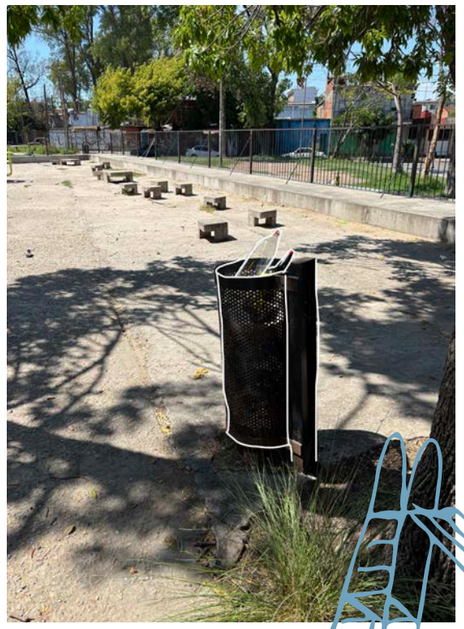
Noisy highway...

The open space is divided into sections for playgrounds, soccer, basketball, and social interaction. Vegetation primarily borders the area, leaving large sun-exposed spaces without shade. Newly planted trees struggle to survive due to ant infestations and intense sunlight.

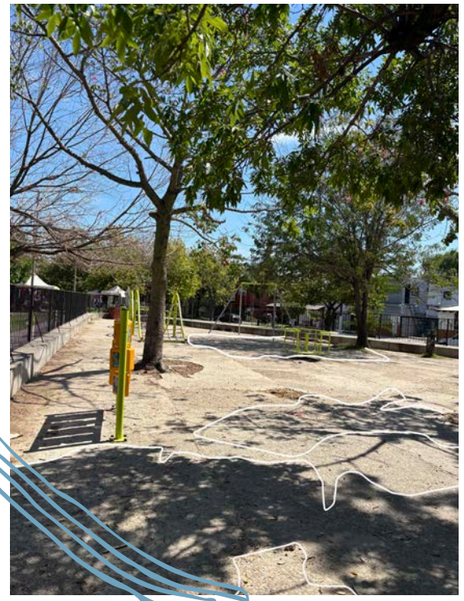
During the restoration, residents wanted to preserve the creek with water and vegetation, but it now resembles a small dumping ground.

Arriving at Plaza 9 De Julio differed from what we had seen before. It is a park in a more developed neighborhood, surrounded by calm streets offering a public space. The park offers places for social interactions, such as concrete furniture well used by people, a small market offering clothes and items, and an equipped playground.

Our first impression of the park was that only small amounts of waste were on the ground; instead, the trash bins were filled.



The vegetation is characterized by older trees that provide appreciable shade in the summer, notably because people only occupy the tables in the shadow. The trees and shade become evident even in the playground, where the ground is hardened.



The canal acts as a barrier, dividing two neigborhoods.

Our third stop was along the Parque Lineal José Ingenieros, which divides two formal neighborhoods with different economic statuses. The first thing noted is that the area is fenced in, with only a few openings, maybe because of its location close to water.

On one end there is an abandoned playground; on the other, the neighbors create a newer place. A new playground, barbeque, and place for social interactions are located in the shadow. The infrastructure the neighborhood called ”Grandpas Park” created was not apparent initially. It is hidden under the tree crowns, with only one visitor but traces of many more. Some people seek shade under the trees on the other side of the channel.

The public space acts like a green path, unlike the surrounding grey infrastructure. Plenty of old trees create shade; the tree crowns act like a ceiling, and the high green grass acts like a carpet. Birdsong is heard everywhere, deleting the sounds from the surroundings.

Moreover, flowers and bigger plants are also seen outside the fence, most likely planted by the neighbors.

Fig. 16. Photos over Laguna El Libertador
© DISU

Fig. 17. Photos over Laguna El Libertador
© DISU

Our last stop, Laguna El Libertador, was visited twice, one time on March 3rd and one on February 21st. The lagoon is located on the outskirts of a neighborhood and was created at the same time as the highway that goes nearby. We were told that it is an initiative from CREAMSE.

The lagoon is always filled with water and contains a lot of vegetation, trees, bushes, and smaller plants. It provides ecological benefits and favors biodiversity since it is not overbuilt despite being taken over by waste.

Since it is an inaccessible area, we did not see any social interactions, but there were traces of people burning waste.

1 Parque Lineal Artigas

2 Plaza Eucaliptus

3 Plaza 9 de Julio

4 Parque Lineal José Ingenieros

5 Laguna El Libertador

6 Plaza Martin Mendoza

7 Plaza Nicolas II

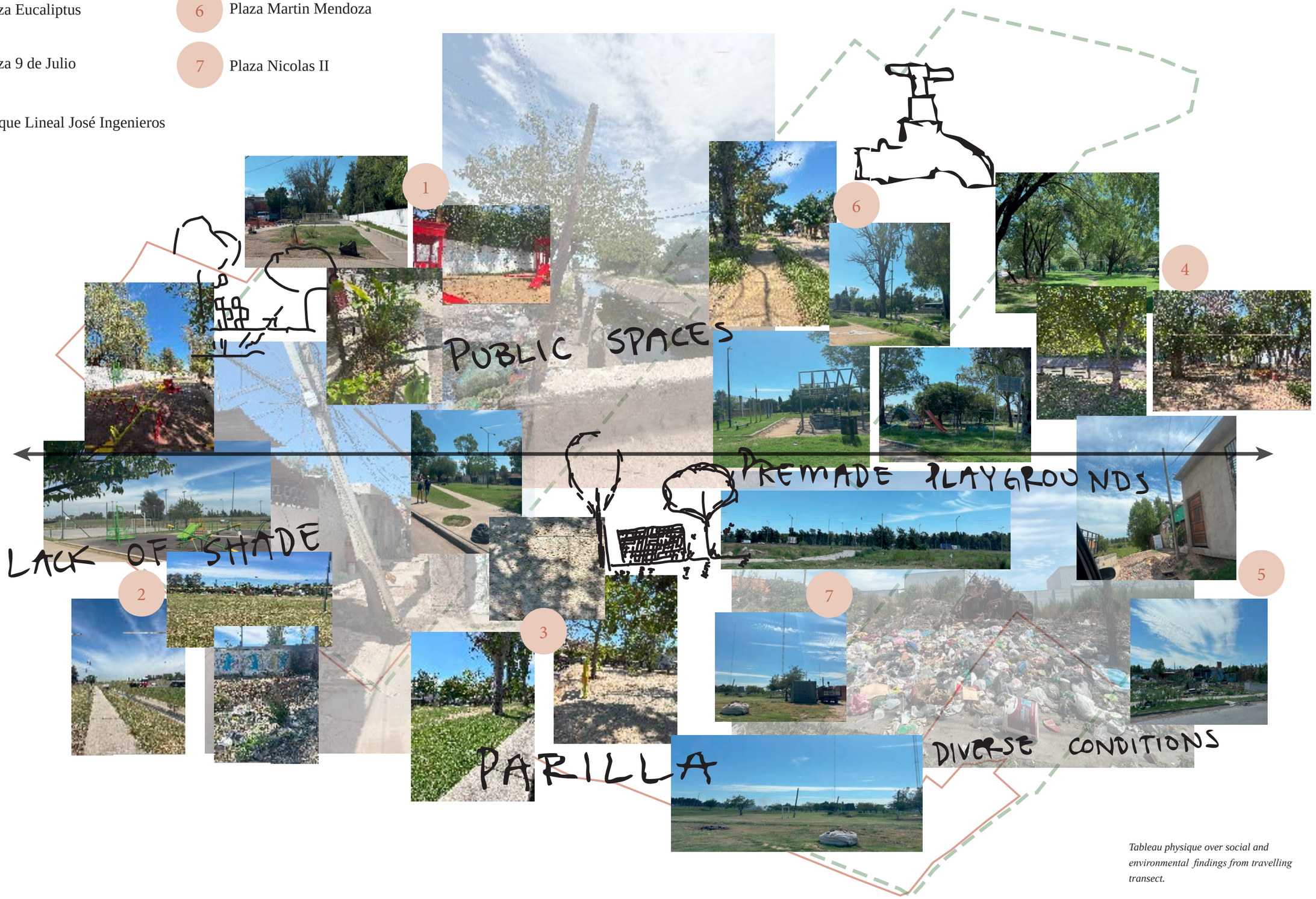


Tableau physique over social and environmental findings from travelling transect.

3.1.2 Meetings and interviews

Beyond the travelling transect, we have participated in meetings held by the Municipality of San Martín on-site and conducted interviews with individuals from the DISU board. Attending meetings with the municipality was an opportunity to gain more time on site and recognize more interactions between people than we were able to during the travelling transect. Performing interviews was a part of broadening our understanding of the current social situation, better understanding the relationship between communities and DISU, and getting to know more of the municipality's perspective and how they look at developing public spaces.

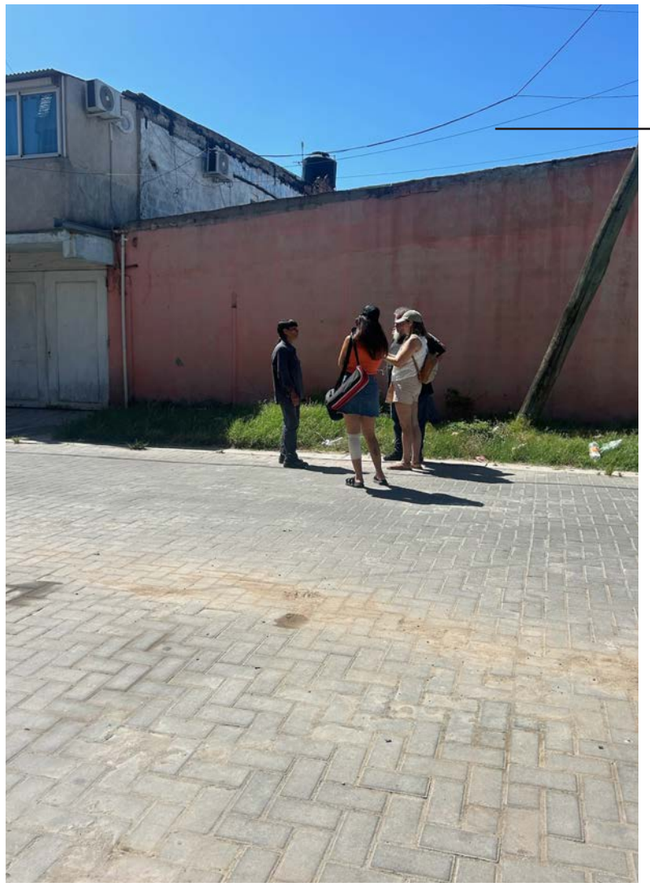
The meetings we attended occurred on two sites, one that has been developed and one where a planned development that stopped is now reoccurring. Representatives from DISU and other workers from the Municipality of San Martín attended both meetings.

2025-01-31

Martin Fierro's neighborhood was visited twice for two different purposes. In this neighborhood, an ongoing development is just starting again. There has been a development process that had to stop because of government resources, something that, Guido tells us on-site, has caused frustration among the residents and some tension against the Municipality of San Martín.

The first meeting happened with Guido and others from the Municipality of San Martín. The main focus was to evaluate how the building of new sewage systems was proceeding. A project initiated by the Municipality of San Martín trying to create more sustainable living situations in the informal settlements. The meeting led us into the narrow paths separating different families' housing from each other, showing us the current living situation in what Guido told us is a popular neighborhood. From this meeting, the role of women and men gets a bit clearer to us as to how gender roles, in effect, work. Everyone is involved in the development but with different focuses. Women take more responsibility and want to be a part of planning the construction, while men do the construction work.

At the meeting, interviews were conducted with women and men working on the sewage development. We understood this was an uncomfortable situation for the workers during the interviews. As part of the neighborhood community, they only want to show the media the best parts of a popular neighborhood like this, mainly to prove that they're also progressing in development.



In these areas, we noticed that people are proud of their neighborhoods. We attended an interview and media clip on-site, and it was clear that the residents did not want to present their neighborhood as undeveloped. They actively choose a background based on how developed it looks or show areas where there is an ongoing development process.

While attending the meeting, it was notable that the women take the initiative, show engagement, and care about their community. Women are often involved in planning the development process and expressing their opinions, while men, who often work as constructors, are seen carrying out the construction work.

2025-02-21

The second meeting we attended focused on trying to finish a part of a public space for which DISU had already made drawings. We participated in the meeting with Guadalupe from DISU. The lack of resources from the government made the municipality and the neighborhood together take the development into their own hands. Guadalupe explains that the idea is to finish a part of the designed park with the community by supplying materials and letting the community do the construction work. This meeting is about planning how the construction work will be carried out.

Two women and a man met us on-site. For us, this was a direct understanding of the women's role and their motivation to have the responsibility to develop their neighborhoods. The women stayed during the meeting and expressed their thoughts about the proposed design and process and what they think is manageable in terms of construction, while the man did not participate in the meeting at all.

The place of the new park is high exposet to the sun.

2025-02-03

At Parque Lineal Artigas, we attended another meeting before we started our travel transect that day. Together with Guido and Guadalupe, we met a man who had the main responsibility for maintaining the site developed by DISU. An engaged woman from the neighborhood also showed interest and gave input about things connected to maintenance that did not work as well as she wanted.

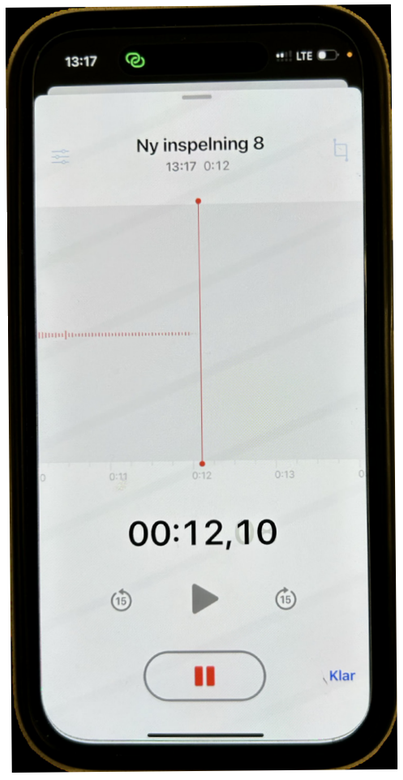
The meetings mainly focused on guidelines for the community regarding the further maintenance of the area. Guidelines focused on safety since the area contains many elements for kids and is near a trafficked road. During the meeting, we understood that maintenance is a difficult question. Maintaining some parts of Parque Lineal Artigas is more straightforward than others because people across the streets consider it "their" park. Others are more difficult since the residents across the street do not use them at all, which leads to no one taking responsibility for these parts.

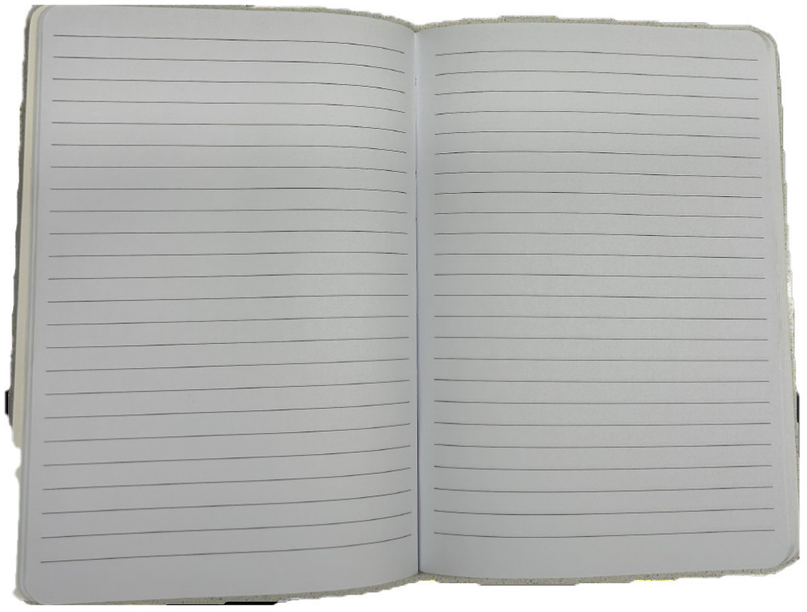
Many of the neighborhoods are called popular neighborhoods and are often crowded. Even during the day on weekdays, a lot of people move into the neighborhoods. One reason is that it is summer vacation, but we do not know.

2025-02-28

The interviews helped us gather the information needed to complement our findings. The interviews were performed during one day at the Municipality of San Martín. Because of a language barrier, the choice of individuals to interview became difficult; therefore, Guido suggested some people he thought could give us interesting insights. In total, we interviewed four people, all of whom were from the DISU board. We got the opportunity to interview Silvana Romano (landscape architect, Demian Rotbart (General Director of Urban Planning), Jose Luis Guallan (Undersecretary of Infrastructure) and Gudio Fischer (Director of Social and urban integration).

As mentioned above, our recommendations for future development will include more insights from the interviews. In that chapter, we will discuss our own thoughts about how to develop the two chosen sites, with support from the interviews and other inspiration for our design.





3.1.3 Action research in the San Martín planta program

Trying to get away from the more traditional site observations we decided to take part in the San Martín Planta project. An ongoing project all around San Martín, initiated by the municipality. This gave us a more hands-on perspective and we were able to understand how the co-working process between the municipality and the community works today and how they try to develop the method to be even more usable and inclusive.

Communities are highly engaged.

2025-01-25 Plaza del Niña

Our first attendance within the San Martín Planta project was at Plaza del Niña, where we were engaged with individuals from DISU.

On the day of participation, the square had its inauguration, and a lot of neighbors of different ages attended. At first, activities like painting, a clown show for kids, and yoga, arranged by the Municipality of San Martín, took place. There was time for the kids to try out the playing equipment and possibilities for adults to share their thoughts with Guido and the major who attended. A major that, in our eyes, was hard to recognize because he was acting and dressing like any other neighbor.

After the activities, it was time to plant around the square, complementing the existing vegetation. The plants were from a local nursery close to the neighborhood, which Guido told us was the first time plants from this nursery were planted in a project. The neighbors very much appreciated participating in the planting. Kids, adults, and older people - everybody wanted to plant, and a feeling of disappointment nearly occurred when all the plants were planted.

Being on-site, we noticed an apparent lack of shade, with the square only having a few well-established trees and situated in an area exposed to the sun all day. Hopefully, the newly planted vegetation will add shade in a couple of years and reduce the heat island effect at the square. It is needed and will be appreciated because it’s clear that people seek shade, and it is where they gather.

The engagement reaches a diverse range of ages, and while participating in the San Martín Planta project, we noticed that some kids and adults were disappointed when all the plants were planted.

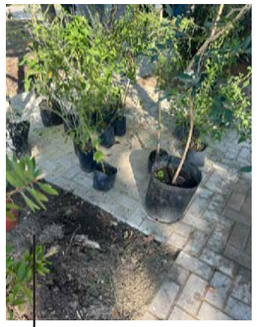
2025-02-04 Paeso del Periodista

This square, in English, called “the journalists square,” is formed like a triangle and is located in the middle of a neighborhood. On-site, Guido told us that the planting this day was a preparation for the upcoming inauguration in one or two months.

Arriving at the site, neighbors and individuals from DISU had already tried to spread out the plants at the square. Some uncertainty about which plants suited where occurred, and we, with our experience as landscape architecture students, gave some advice on how to think about the positions of the plants.

The neighbors were engaged and had a lot of knowledge. The most heard words on site were “agua, agua, agua.”

Workers from the nurseries engage on-site when their plants are planted in a nearby neighborhood.



Plants from local nurseries.

3.2 Findings

Performing the travelling transect, we noticed two public spaces: Plaza Martín Mendoza and Plaza Nicolas II, which the Municipality of San Martín has not developed. Both public spaces offer complexities, but in different ways—in the form of other ecological and social conditions, where we noted possibilities for improvement.

Plaza Martin Mendoza is in a formal neighborhood but faces social challenges primarily connected to on-site safety. The location and well-developed green infrastructure are qualities that could be kept.

Plaza Nicolas II, located on the outskirts of an informal settlement, also faces social challenges. The site's location in the landscape could be a challenge in creating a public space that people of all ages could use. Today, it is a space surrounded by barriers such as trafficked roads, and it is used as a space to burn waste, not a space that offers recreation. The green and blue infrastructure is mediocre, but it is a quality that could be supplemented with more vegetation if designed correctly.

Examples of findings from site visits.

3.2.1 Plaza Martin Mendoza

Plaza Martin Mendosa is a public space that has been requested for restoration by the nearby neighborhood, according to DISU. It is located along the José Ingenieros River, contiguous to a chapel to the northwest and surrounded by residential areas. A road and sidewalk provide access to the park, but we did not observe it as a heavily trafficked road on-site. A bridge connects the park with the community on the opposite side of the river, but we found out it is currently broken. The community took hold of the problem alone to avoid people going over it. As a result, accessing the park can be challenging. Children must cross a road to reach it, and for those on the other side of the river, there is a considerable distance to the nearest bridge.

We made a quick stop during our visit because we felt unsafe, based on our guides' information that this public space has a reputation for being problematic due to its social complexities, which we do not know more about.

The park offers various opportunities for social interactions and recreational activities, featuring playground equipment, an outdoor gym, a barbecue, tables, and benches. The river's elevation makes it difficult to access and creates a sense of disconnection from the water. Past incidents involving people who unfortunately lost their lives in the river have contributed to this separation and reduced community engagement with the park. At the time, the park was nearly empty, with only two people and a horse resting in the shade under a tree near the river, which could have had social complexities, too.

At first glance, the green infrastructure of Plaza Martin Mendoza appeared well-established. Grass lawns occupied a more significant part of the park than the concrete pathways, and trees of various sizes added a sense of dimension and a higher ecological value, enriching the plaza with shade. Even a dead tree was preserved, perhaps due to a lack of management to remove it; however, it contributes to biodiversity by serving as a habitat for numerous insects. There was some garbage, especially in one part of the park. Throughout the neighborhood, waste occurred because of the limited waste management, even in the park garb and age cans.

Well used playground in the high grass.

Small stream of water filled with trash.

Well established existing vegetation creating shade.

Noicy well trafficed highway

Proximity to Laguna El Libertador

Black marks after burned trash.

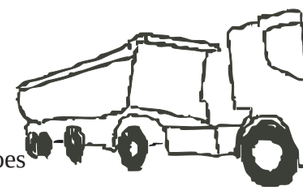
3.2.2 Plaza Nicolas II

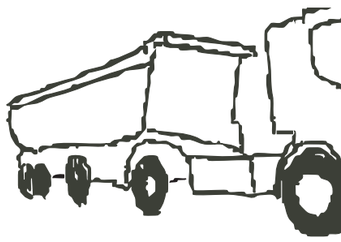
Plaza Nicolas II is a spacious open area behind a neighborhood, bordered by high-traffic roads on three sides. The neighborhood, perched on a hill behind the public space, is significant in managing stormwater because the highway restricts water flow towards the river. On-site, we were told that the plaza often experiences standing water when a substantial amount of rainfall needs to be managed along with runoff from the surrounding neighborhood.

The public space is accessible from one side directly connected to the neighborhood. On this side, you only need to get past the last lane of houses. However, the high-traffic roads create a distinct boundary, making it difficult for those without a vehicle to reach the area. Additionally, the heavy traffic contributes to elevated noise levels.

The area offers opportunities for a variety of activities. It could benefit from improved on-site infrastructure. Today, the neighbors built a wooden frame for playing, creating a designated space for play and games. One activity we observed on-site was waste burning, with leftovers apparent throughout the area. The space was not filled with waste, but there were round marks of black coal on the ground, indicating something had been burnt.

The green infrastructure at Plaza Nicolas II is currently underdeveloped. A few old trees provide shade along one edge of the area, but apart from that, it is highly exposed to the sun. The flat surface, predominantly grass-covered, shows signs of stress from the heat and sun. The lack of existing vegetation creates issues on sight; with standing water and high temperatures, the site does not encourage usage.





3.2.3 Recommendations for future development

We want to use our environmental, social, and political findings to discuss how to develop Plaza Martin Mendosa and Plaza Nicolas II in the future. By investigating how they look today and what challenges and qualities the two public spaces have, which we present above, we use our knowledge as landscape architect students to create recommendations for improvement toward sustainable public spaces. Our proposal will take inspiration from the interviews we conducted at DISU and is also inspired by Parc aux Angéliques, which we will introduce further.

3.2.3.1 Parc aux angelique

Parc aux Angéliques is located along the Garonne River, Bordeaux, and is a part of the re-appropriation of the Garonne proper river bank. (Leger-Smith & Smith, 2019). The park is located in a former industrial zone with some polluted regions. Sustainable development has during the design been an important part, and the development has a focus on conserving the river bank, contributing to the prevention of flood risks, trying to optimize the water management, and planting native species adapted to the soil and climate (Bordeaux Metropole, 2024).

The transformation of the Garonne river bank lasted several decades, and the design was implemented gradually depending on the current opportunities (CDM, n.d.). To re-appropriate the Garonne river bank, an essential part of the design was to expose the pre-existing and, simultaneously, propose a landscape structure for long-term environmental adaptation and create something for residents and users. This was done by establishing a flexible public space, activating the site, and creating a public space that allows diverse people to meet and engage in different ways (Leger-Smith & Smith, 2019).

The design also takes a stance on the idea of using afforestation to establish new vegetation. Planting vegetation gradually with this method will bear traces of time. The trees are planted in gridded alignments, with empty squares from which trees are absent, squares with trees in the growing phase, and squares with trees at maturity. These gridded alignments are established irregularly but continuously perpendicular to the riverbank (CDM, n.d.) Establishing perpendicular vegetation reminds the residents of the site's transformation within the urban landscape and highlights its industrial and ecological history (Leger-Smith & Smith 2019).

Fig. 18. Parc aux Angéliques, when a city gives up building dozens of hectares in favor for a park, a river, and public spaces © Mairie de Bordeaux, Thomas Sanson

Fig. 19. Line of trees planted irregularly, but always perpendicular to the river bank © Guillaume Leuregans

Fig. 20. Line of trees planted perpendicular to the river bank, seen from above © Damien Butin, Bordeaux Métropole, Anaïs Leger-Smith and Paul Smith

Fig. 21. Landscape plan over one sequence of Parc aux Angéliques © Courtesy of Bordeaux Métropole

3.2.3.2 Plaza Martin Mendoza

The primary challenge facing Plaza Martin Mendoza lies in its social situation. As noted earlier, the community has requested improvements due to safety concerns. This situation presents a valuable opportunity to enhance the public space by implementing nature-based solutions that promote social equity and address the park's social issues (Kabisch et al., 2017). General Director of Urban Planning at DISU, Demian Rotbart, explains that the Municipality of San Martín has come to recognize that the social benefits of nature-based solutions may outweigh their ecological benefits in a context where social fragmentation is so well-defined.

Coping with the social challenges, Plaza Martin Mendoza could benefit from a renewed purpose. Taking inspiration from Parc aux Angélique, we think this could be reached by creating a flexible public space. On-site, we felt this was not a place for kids to play because of their relationship with the river and the social context. We recommend creating opportunities for diverse meetings and recreation and creating a place for all ages by planting new vegetation in lower layers without affecting safety.

The existing vegetation holds considerable significance, and as such, it could be further enriched with additional plant life, such as flowers and low bushes, to attract beneficial pollinators, all while ensuring safety is upheld. Introducing new flowers and low bushes could enhance the park's aesthetic appeal, making the environment more pleasant for the community. The landscape architect Silvana Romano, from DISU, told us that this perspective has evolved since she began her career in 2012. Initially focused on the aesthetic value of native species, she has come to recognize the deeper intention of caring for butterflies, birds, and other wildlife. Romano also believes that in a place perceived as beautiful and well-maintained, residents are more willing to keep it that way and refrain from littering. Therefore, we think the sense of ownership could increase the maintenance and care needed for Plaza Martin Mendosa.

"In beneficio de hombre, beneficio de la social."

During the interview, Jose Luis Guallan expressed that vegetation is essential for us all to benefit man and society. He pointed out that trees have been planted in environments that are not their natural habitat, and he advocates for our active contribution to this effort. For trees and vegetation to flourish, they must have the necessary conditions, as the trees and green spaces in urban areas play a vital role in mitigating climate change. This is something we agree with him on, to keep in mind that nature should always be a critical part of a public space, which is why we encourage more planting,

This public space should involve the community and neighboring residents to address the social situation effectively. When individuals take ownership of the park and visit it more frequently, their motivation to maintain this public space increases, especially if they are involved in its development and ongoing management (Kabisch et al., 2017). There is already significant interest and motivation among residents, as they are the ones advocating for change in this park. Considering safety concerns, another way to involve the residents is through education. Romano suggests that educating residents can establish a new or more substantial commitment, which could be a good option for an urban space like Plaza Martin Mendosa. Engagement in this social context revolves around a co-creation and management process. In the Reconquista river area, as noted by Rotbart, this process aims to develop an environment where the needs of community representatives and public space users are represented and maintained by themselves. This initiative also empowers women in the social context since they are often more present in the neighborhood and have become community representatives.

Trying to remind the residents of the site as part of the transformation within the urban landscape and highlight its industrial and ecological history. One way could be establishing new vegetation perpendicular to the Jose en Quinidos River. This method has been used in Parc aux Angelique, but at Plaza Martin Mendoza, the establishment of new vegetation in this way would be at a much smaller scale but hopefully with the same outcome, to create a new relationship between the residents and the river. In this context, Guido Fischer, Director of Social and Urban Integration, gave us essential input on the problematic view that the river brings today. Reminding the residents about the river being used as sewers and trash disposals. Since the existing vegetation is so well established, changing the residents' relationship with the river could be as important as creating a green-blue link.

Plaza Martin Mendoza, an overlooked forest jewel

Native species we think could be suitable for this public space. We chose options with flowers to benefit biodiversity & to create an esthetic environment that can cope with sun exposure.

Perspective over added vegetation that creates shadow and a likable park that everyone can use.

A section illustrating a possible outcome of Plaza Martin Mendoza. The lower layers of vegetation such as Verbena Bonarienses attracts insects without affecting the safety.

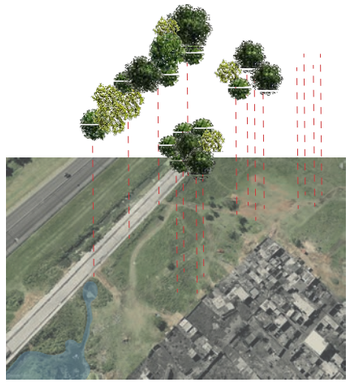
3.2.3.3 Plaza Nicolas II

Based on the current conditions at Plaza Nicolas II, developing this public space focusing on using nature-based solutions would involve increasing and complementing the existing vegetation. As highlighted by Naturvårdsverket (2022), planting trees and additional greenery could effectively manage and reduce the excess water that usually saturates the grass lawn. Presently, the site is highly affected by surrounding barriers such as mountains of landfills and the highway, as Fisher described to us. Looking ahead, it is also important to remember that the site, given the possibility of increased flooding due to climate change, as The City of Buenos Aires (2020) noted, is essential since it naturally collects water. Therefore, Rotbart told us that vegetation could be a viable strategy to address a problem that current grey infrastructure fails to manage.

In seeking guidelines for a new site design that addresses various layers of issues to be solved, we came up with one potential solution: implementing an artificial wetland to manage excess water sustainably. Guallan explains that nature has been excessively harmed, and it is time to respect it. This is what is needed in Plaza Nicolas II. Rather than attributing the issues of the public space, we should acknowledge the power of nature and work towards a positive solution for areas prone to water accumulation. This approach would prevent adverse effects on housing and ensure safety for residents. During the interview, Rotbart contributed his insights on the Municipality's current efforts to experiment with NBS solutions to address problems with flooding and standing water, which could be a valuable strategy for them.

To maintain the recreational value of the area, it would be a good idea to establish walking paths to navigate through the vegetation and the wetland. Fischer shared his thoughts about the site being a good experiment, including green-blue infrastructure in a park or public space and keeping the site usable for the residents. The usage of public space is essential, which ADEC (n.d.) describes as crucial for social cause and sustainability due to human health (UN-Habitat, 2018). A public space of this nature also provides a way of creating possibilities for public meetings and gatherings. Rotbart explains this as crucial in bridging socioeconomic distances and restoring the human connection with nature.

Trying to establish a structure, which Plaza Nicolas II lacks, we take inspiration from Parc aux Angéliques, where trees have been planted in gridded alignments that alternate between densely planted blocks within different time frames. Using this method at Plaza Nicolas II, we recommend prioritizing planting trees closest to the highway and using different native species since they are well adapted to the climate. Planting within various time frames also creates a possibility to ensure that there is always vegetation, creating an on-site structure that could manage possible standing water. This vegetation will also offer much-needed shade, addressing one of the primary concerns today and helping reduce noise from the nearby highway. Examples of vegetation suitable for this site are Erythrina crista-galli and Salix humboldtiana, two native species that can withstand standing water.

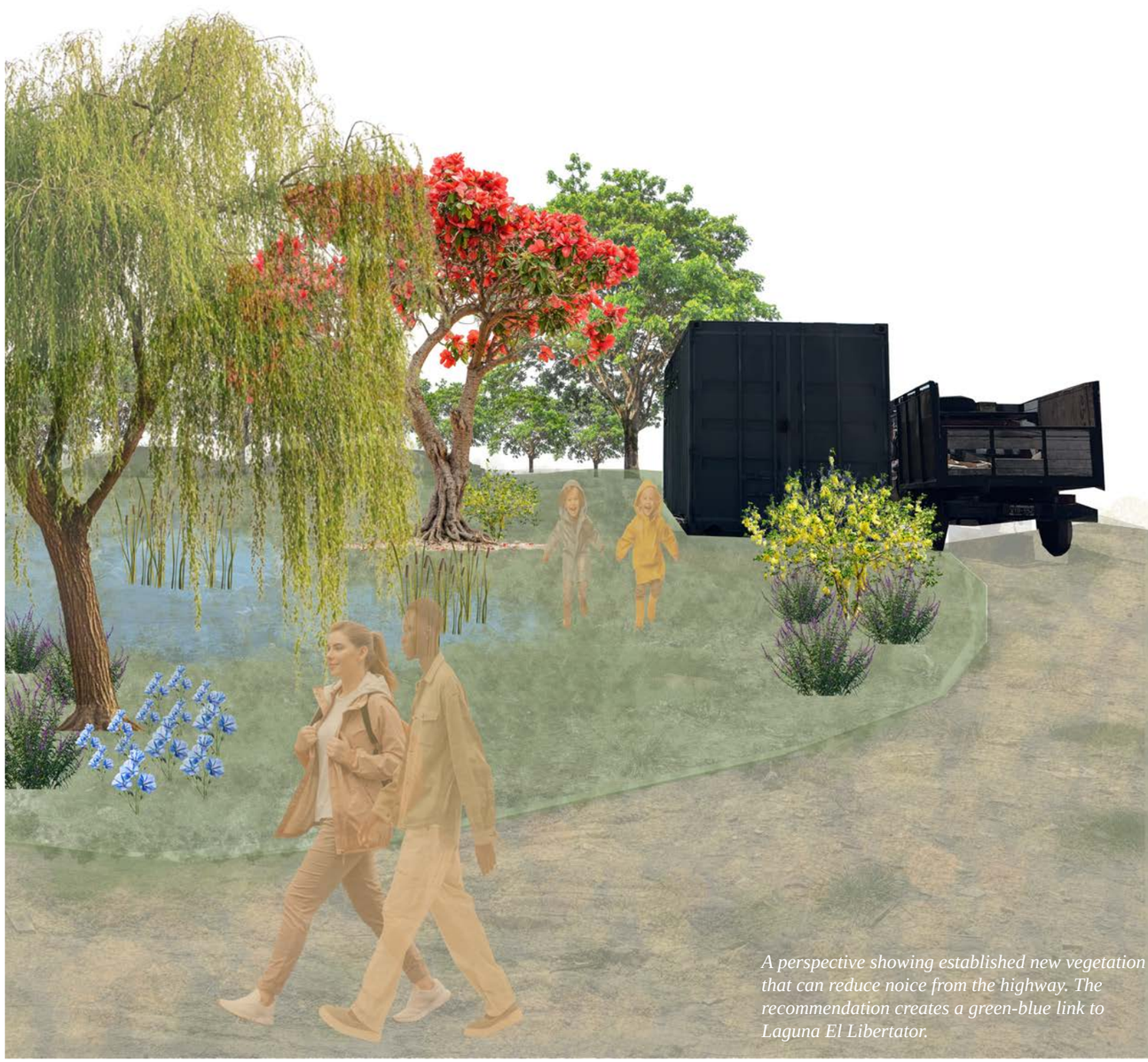


Another way of establishing vegetation is to plant a buffer strip along the park, which could benefit the green and blue infrastructure on-site, especially considering the lagoon's proximity. Parc aux Angéliques, for example, created an ecological riparian zone to foster a dynamic biodiversity reserve.

Plaza Nicolas II is an informal public space on an informal settlement's outskirts. The development of this space requires community engagement, ensuring that the process aligns with the community's interests, which we found interesting while interviewing Fischer. He emphasized the importance of prioritizing women, who are often more present yet lack a strong voice during organized meetings. Guallan also talked about this and pointed out that public spaces frequently face degradation, particularly on the outskirts of a large city. At the Municipality, efforts are being made to highlight these spaces' importance and further their development. He adds that it is a fundamental possibility for women to apprehend the public space, leading to further design and development, even if it is a complex topic. The management of sustainable public spaces involves teamwork, where women should be seen as an integral part of everything that has to do with urban development. We think that by including the communities more in developing public spaces, especially in San Martín and their arrangement with San Martín Planta, the women's voices will be heard, and their societal role could be strengthened.

Plaza Nicolas II, a potential green lung

We chose native species that can survive standing water, while creating shadow to the sun exposured site, for example the national flower Erythrina crista-galli.



A perspective showing established new vegetation that can reduce noice from the highway. The recommendation creates a green-blue link to Laguna El Libertator.

In this section, we made an illustration of a possible artifical wetland, so the public space can be used even when high water levels occur.

3.3 Answering our research questions

Investigating gender, community, and environmental sustainability along the Reconquista River in Buenos Aires revealed a nuanced interplay between social and ecological concerns. Our findings indicate that environmental denigration and social inequities pose challenges for public space development, where fragmentation, socioeconomic disparities, and a lack of trust between communities and authorities make it difficult to achieve sustainability.

The current state of green-blue infrastructure is characterized by various natural and built environments. In some public spaces, the vegetation is high-quality and well-established, holding ecological value. In other public spaces, the green infrastructure is underdeveloped, facing significant challenges, including pollution, inadequate waste management, and urbanization's impact.

Trying to change the relationship between humans and nature, it becomes clear that local communities must actively manage the river's ecology and enhance public spaces to achieve long-term sustainable development. Many women are already leading the way in community organizations focused on environmental education. As primary caregivers, women possess invaluable local knowledge and perspectives that can contribute to effective environmental strategies, enhance ecological health, and empower residents to be more included in maintaining these public spaces. By ensuring that women are represented in decision-making processes, we can integrate their participation into local planning and urban development, making them an integral part of the solution.

DISU is a beacon of hope, promoting participatory planning and educational initiatives to engage residents in tackling social and ecological challenges. By incorporating local communities into urban planning and decision-making processes, the unit ensures more equitable and resilient development. This approach strengthens community bonds and ensures that residents' needs and aspirations are at the forefront of creating sustainable urban spaces, inspiring a brighter future for urban sustainability.

4. Reflections and Conclusion

In this chapter we will discuss our findings and the importance of public spaces. The social and ecological sustainability has proven to be relevant in developing public spaces within the fragmented landscape of the Reconquista river basin. Additionally, we conclude the chapter with a statement that we need to change the humans relationship with nature.

4.1 Reflections

According to the findings, public space is vital in encouraging social and ecological sustainability. The Reconquista river basin is a complex landscape characterized by economic inequity, unsustainable infrastructure, and a lack of cooperation among communities and authorities. In such fragmented areas, public spaces can help bridge socio-economic gaps and create accessible places for everyone. In the Reconquista river area, it is essential to create a new relationship between humans and nature because educating the residents in the Reconquista area will lead to more sustainable commitment when they understand that well-developed ecosystems will benefit them. A shift in perspective is necessary to view nature as a beneficial entity rather than a threat.

In the studied marginalized areas, it becomes evident that public space development must prioritize the voices of those who utilize the place to be heard. Inclusivity and diversity are essential for co-creation, fostering trust between communities and municipalities. The Municipality of San Martín works with nature-based solutions to address ecological and social challenges. Today, the future is uncertain. Not knowing what the future holds makes it impossible to know beforehand what will solve the problems connected to a changing climate. Therefore, it is possible to question the concept of nature-based solutions, or rather, it is essential to reformulate and highlight that it is not a concrete solution. It is a way to break down problems into pieces and collect valuable insights about the pieces individually, not finding an entire solution. In a complex social context, like the one surrounding the Reconquista River Basin, nature-based solutions could be suitable for addressing social and ecological problems affecting the well-being of residents. It is a way of addressing local issues and an experiment to gather valuable knowledge about the subject. A constant striving towards a solution that cannot be fixed in a day or with constant flexibility along the way.

The investigated public spaces are formal and informal, meaning maintenance is performed through the governance or communities and, therefore, varies in quality. If community engagement is insufficient in an informal public space, these sites become oblivion and create an unsafe environment for the residents. Therefore, women must step forward and believe their societal role could make a difference. Women, already undervalued in the fragmented city, face significant barriers to their opportunities. However, with improved trust between the community and the municipality, which seeks to elevate women's societal role, design and public space initiatives can engage women more and strengthen their influence. Based on the findings, women's role in society has emerged, and there is a difference between speaking about change and making change. In the Reconquista river area the women take initiative and show that they want to be a part of developing and making a difference. The women from these fragmented areas are the ones who understand their communities the most. Providing them with more significant opportunities for involvement can serve as a powerful means of bridging social divides. Therefore, equality is essential to strengthen their voices. Without their voices being heard, developing public spaces and achieving something sustainable for the future will be hard. Thus, the challenges surrounding women's roles extend beyond cultural norms; this shift represents a positive step toward a sustainable future.

Designing a park involves more than just creating a physical space; it also requires understanding the city's complex and fragmented nature, which faces various challenges that restrict the effective functioning of public spaces. Plaza Martin Mendoza and Plaza Nicolas hold several differences, as one is a formal public space with resources from authorities, and the other is considered an informal public space where the community is responsible. It is important to remember that the presented recommendations for the sites are not solutions. The recommendations are based on the site's current situation and condition, making it impossible to know whether the sites will be able to meet the exact expectations in 1, 30, or 200 years. Nature-based solutions have been used to address the occurring problems on site and to strive against sustainability. Our work can inspire DISU to discuss potential future research and how they can use nature-based solutions to identify problems, not as a solution.

4.1.1 Reflections of methods

In this study, as described in the method, we employed a qualitative mixed-methods approach to answer our research questions. A literary study, travelling transect, semi-structured interviews, and action research have evaluated this research as tools to perceive the ecological and social context of the Reconquista River Area.

The literary study provided valuable insights into the current situation in Buenos Aires and highlighted pertinent facts. However, it could not fully capture the practical realities on-site. Action research and semi-structured interviews became essential as they helped bridge the gap between theory and practice, which is one of the reasons we were on-site in Argentina to perform this field study. Another reason that we chose to use a qualitative study and not a quantitative study method lies in the fact that a quantitative study presents numerical data. In contrast, qualitative research describes situations, people, interactions, and observations to seek the depth and context of a bigger perspective, which are crucial to understanding sociality (Cadena-Iñiguez et al., 2017).

However, using a quantitative method would provide us with generalized insights in a quantity we could never reach on-site. It is easily understandable and can be analyzed with statistical methods, a structured way to increase the validity of findings, which is essential for verifying results later on. Another time perspective is also achieved through longitudinal studies where changes over time could give insights into trends and data changes (Cadena-Iñiguez et al., 2017).

In our situation, focusing on understanding individuals within their context, the qualitative method allowed us to capture the whole social situation and value and consider all perspectives (Cadena-Iñiguez et al., 2017), which we considered more valuable than a generalized view. Both of us, coming from another type of society compared to the Reconquista Area in Buenos Aires, are convinced that a thesis built on a quantitative method would not have given us the same perceptions as using a qualitative method. Our chance of understanding the cultural context, social structures, impacts of external factors such as government policies, and local knowledge about the complex realities faced by individuals in the community would not have been as fair if we proceeded with only measurable data (Cadena-Iñiguez et al., 2017).

Therefore, our qualitative studies and travelling transect, which involved pre-travel research, on-site exploration, post-travel discussions, and action research, significantly enhanced our comprehension of landscapes. This structured approach allowed us to examine site qualities within their contexts, establishing a foundation for a thorough and varied analysis.

Performing semi-structured interviews allowed us to understand the context from another perspective. This approach gave us open-ended answers that we could compare with our own insights from on-site and enabled further discussions (Liegard, 2023).

Due to the language barrier and the limited number of contacts in Buenos Aires, it has been challenging to find people to interview. As mentioned in the methodology, the individuals selected for interviews significantly influence DISU and their key role in the sustainable development process in San Martín. Each interview generated different insights, reflecting the varied lengths of experience in their respective fields. For instance, the Director of Social and Urban Integration has much knowledge about site-specific challenges. At the same time, the General Director of Urban Planning offers a broader perspective on the municipality as a whole. Considering that these varying viewpoints can impact the results while enriching the findings' diversity is important.

4.1.2 Experience working together

As mentioned, working together has significantly enhanced the process despite our similar backgrounds and two different objectives. We have gained insights from each other's perspectives, deepening our understanding of the context we entered and the goals we aim to achieve with this thesis.

4.2 Conclusion

Research and engagement have facilitated and enabled insights into gender, urban planning, and environmental justice that will help to develop more effective and resilient urban solutions. As a result of this study, future initiatives can build on lessons learned to create sustainable, climate-resilient urban spaces that protect natural resources and improve the quality of life for urban residents. It might seem like a small insight, but it is worth exploring.

The outskirts of the city will not become part of the formal city unless we do something about it. Since NBS could be used as a concept that addresses the interplay between ecological and social challenges, further development with NBS applied to public spaces could help contribute to a more compounded city.

This leaves us with one question: How could the development of public spaces contribute to the integration of the informal and formal parts of a city?

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