

# Living on the Edges of a Border City

**The case of Cucuta and El Rodeo**

**Planning strategies for the spontaneous city**

**Federico Bernal**

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The Case of Cucuta and El Rodeo

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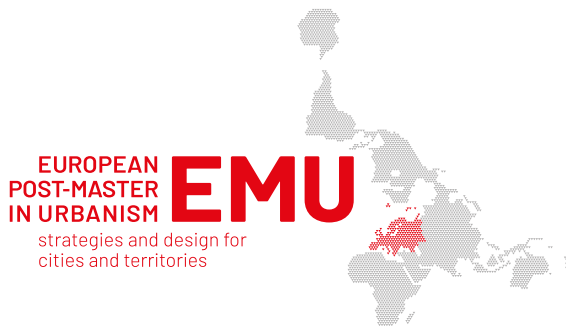
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Cover picture: Soil texture of El Rodeo, Cucuta (F. Bernal, 2020)

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*To my father,*

*Juan Manuel Bernal Hadad*

*(1953 - 2020)*

*Thanks for always being there.*

# Abstract

Cucuta is a border city between Colombia and Venezuela with complex dynamics due to its location and historical background, affected by drug trafficking, guerrilla warfare, and Venezuela's most recent multidimensional crisis. The city's structural plan (POT) is under review, trying to adapt to the local and global challenges: mass migration; social integration of communities in a post-conflict transition; an economic shift from a commercial dependency of the border into a self-productive region; the demand for housing and the occupation of high-risk areas, are some of the main aspects. These issues are more evident in the fringe areas of the city (edges), where informality is the main pattern of urban growth, with a later upgrade by the local government.

Then, how to achieve an inclusive urban development in the edges of a border city with rapid social and economic transformations?

This graduation project explores the process of urbanization in the edges of Cucuta and the implications of the border in the city's growth. The intention is to question the disparity between spatial planning and the spontaneous consolidation of the city's peripheries. In particular, this research focuses on one of these edges called 'El Rodeo', where more than 5,000 families have settled illegally during the last 20 years. Currently, there is a community development project for this area that involves multiple stakeholders, including the mayor's office. However, there is not a spatial strategy that envisions El Rodeo in the coming years.

Hopefully, the outcome of this work can be used as feedback for the planning office and inspire interventions in similar contexts.

## Notes

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- All plans are facing north.
- When referring to Cucuta it means the municipality and in some cases its citizens.
- The names of community actors were modified to protect their personal data.
- All Spanish accent marks are avoided

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FIG. 1.1 Indigenous landscape of the tropical dry forest, on the edges of the Metropolitan Area of Cucuta close to *Villa del Rosario*. Source: photo taken by the author.



FIG. 1.2 View of the Nazareno Mount on the edges of Cucuta, close to the area called *El Rodeo*. Less than five kilometres away from the previous picture. Photo taken by the author.

*'We are creating the risks with our way of transforming the territory'*  
- Paola Viganò (2020).

PART 1

# Definition

---

Borders and Edges

**'Those peri-urban areas where land is available, inexpensive and outside the control of urban land regulation are sites for localized citizen-led place-making practices.'** *(Andres et al., 2021)*



# BORDER

Fig. 1.3

# 1 – Problem Statement

---



FIG. 1.1 Crisis in Venezuela, 2019. People crossing the International Bridge in Cucuta, 2019. Source: INFOBAE Migration.



FIG. 1.2 Venezuelan Family in *El Rodeo*, Cucuta. 2020. Source: photo taken by the author, 2020.

FIG. 1.3 *Pimpineros* or gasoline smugglers crossing the Tachira River that separates Colombia from Venezuela. Source: cuatrof.net, 2018.

## 1.1 – Introduction

Urban areas continue growing in an exponential way with a marked difference in developing countries. According to UN, 68% of the world population is expected to live in urban areas by 2050, while in countries such as Colombia this number will probably rise to 86% (DANE <sup>1</sup>, 2018). Poor housing affordability, traffic congestion, bad distribution of public goods, environmental degradation and weakness of formal institutions, are some of the common urban issues that exacerbate social inequality<sup>2</sup>. How does this affect the most vulnerable sectors of society? What can be done from spatial planning to reduce these gaps?

This research derives from a personal concern about urban challenges in Colombia, my home country, and understanding how global issues affect local communities. In particular, some of the most latent issues during the last years: mass migration from Venezuela, forced displacement by the guerrilla warfare and the emergence of second-tier cities. In parallel, I received an invitation from ‘El Minuto de Dios’ organization, to collaborate in a project of community development in one of the most vulnerable areas of Cucuta, a border city with rapid social and economic transformations. Therefore, I thought it could be the perfect opportunity to analyse a specific context, interact with some of the stakeholders involved in the project and local actors from this community, also known as *El Rodeo*. It is important to mention that there were no conditions from the ‘client’<sup>3</sup>, only good will to inform their project from the planning perspective.

This project will be explained from two concepts: **Border** and **Edges**. **Border** refers to the political boundary that divides Colombia and Venezuela, but also to the global issues that affect Cucuta and the region. While **Edges**, implies the physical barriers as well as the administrative limits that frame Cucuta as a city. The spontaneous neighbourhoods willing to be inscribed as part of a more consolidated urban fabric. A temporary landscape in constant transformation, built on the fear of an uncertain future. The ‘informal’, the ‘illegal’, the marginal, the ‘problem that needs to be solved’. But it is also the most collective, ‘self-organized’ and most flexible to everyday fluctuations. **The Border describes the context, and the Edges are the focus of attention.** Both intertwine and define the complex relationship between Cucuta and *El Rodeo*.

---

<sup>1</sup> Department of national statistics. The numbers are projections from the census CNPV of 2018.

<sup>2</sup> According to CEPAL, relative income inequality has decreased in most of Latin American countries. However, this indicator refers to a reduction of the gap between the poorest households, ‘which does not guarantee a reduction in the absolute inequality’ (CEPAL, 2019), nor the access to better opportunities and services.

<sup>3</sup> ‘Client’ is the term used by Louis Albrechts in strategic spatial planning (Albrechts, 2001) to describe the client or person that commissions the job to the planner. This relationship will be explained later.

Colombia y Venezuela unidos por siempre  
**Bienvenidos a COLOMBIA**



Fig. 1.3

**BORDER**

Fig. 1.5

FIG. 1.4 (Right) Map of Colombia showing the strategic location of Cucuta and its Metropolitan Area (AMC) in red. Source: Esri. Modified by the author.

FIG. 1.5 (Previous page) Border crossing between Colombia and Venezuela in Villa del Rosario (AMC). Source: photo taken by the author, 2020.



## 1.2 – Cucuta: A Border City with multiple Challenges

Cucuta is the largest city<sup>1</sup> in the border between Colombia and Venezuela, located between the foothills of the Andes mountains and the confluence of the Pamplonita and Tachira Rivers, in the region of Norte de Santander. Its population is estimated in 777,106 inhabitants (DANE projections, 2020) and its Metropolitan Area is about 1 million. It is also considered as the bridge between the two national economies, as most of the migrants and goods cross through this region, despite of being affected during the last decades by drug trafficking, guerrilla warfare and the most recent multidimensional crisis in Venezuela.

The city's structural plan (POT) is under review, trying to adapt to the local and global challenges: mass migration; social integration of communities in a post-conflict transition; an economic shift from a commercial dependency of the border into a self-productive region; the demand of housing and services evident in the occupation of high-risk areas. These are some of the main issues identified at the beginning of this research and will be explored in detail in the following chapters,

<sup>1</sup> In terms of population, Cucuta is the 6th largest city in the country according to the population projections of DANE, 2020.



trying to understand what does it mean living in the border? And which are the most vulnerable areas of the territory?

During the fieldwork, it was possible to experience the border within its highest constraints. Before Covid-19, Cucuta was already stifled by the economic crisis and by the end of 2020, I perceived it in a state of inertia, quite different from what inhabitants describe before 2010, when people used to cross the border without any restrictions. The region's reliance on transboundary commerce and the presence of very few industries, are some of the reasons for being **the city with the highest rate of informal employment in the country with 72.2%** (DANE, 2020). This has also repercussions in the urban development of the city, evident in the way people shape their own environment in the edges or expansion areas of the city.

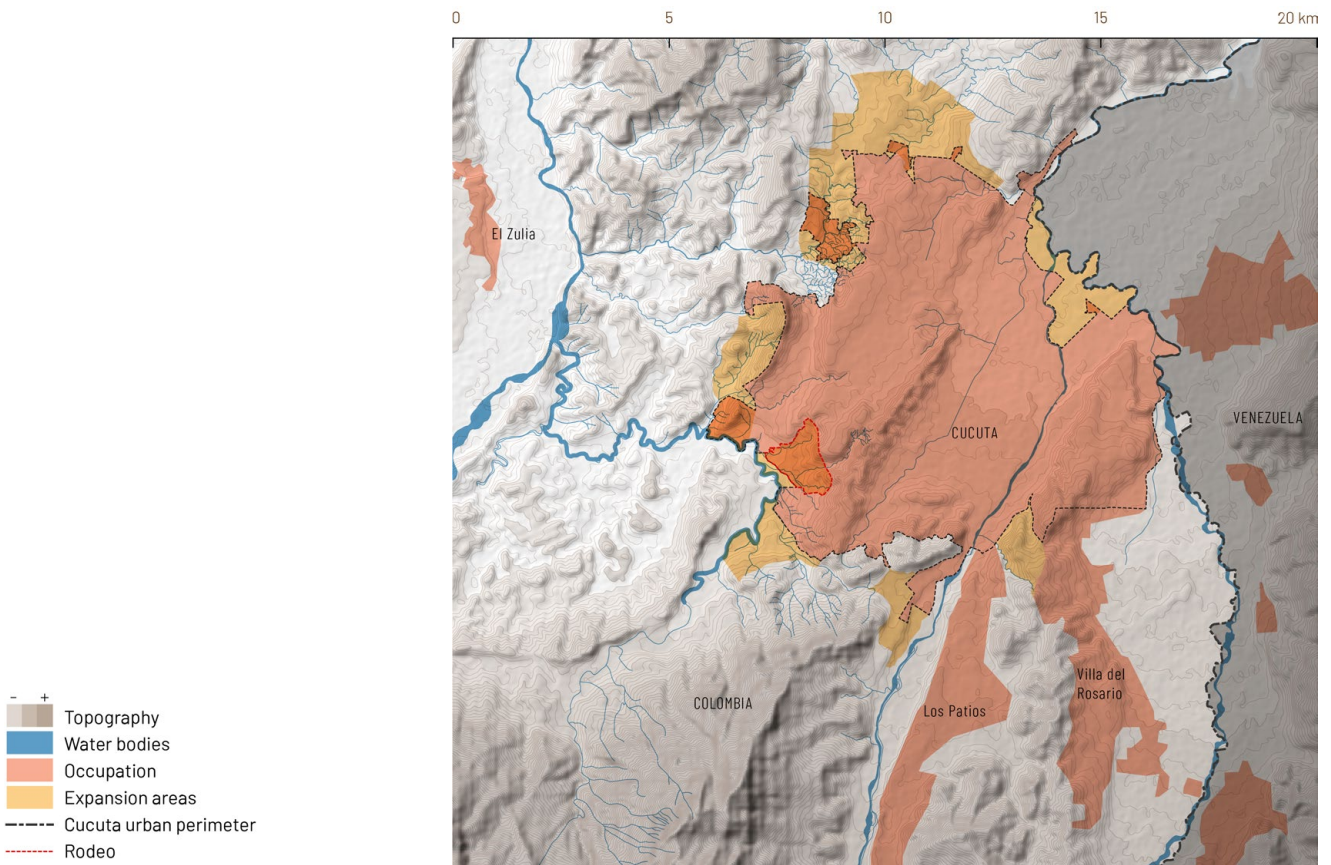


FIG. 1.6 Almost 200 years after the dissolution of 'La Gran Colombia', Cucuta depends on the permeability of the border, as it has strong implications in the development of the city. In yellow the edges or expansion areas of the city, mostly occupied by informal settlements. The red polyline is El Rodeo, the area of study. Source layers: Topography from USGS DEM, and other layers from POT Cucuta. Modified by the author.



Fig. 1.7

# EDGES



# EDGES

Fig. 1.8

### 1.3 – El Rodeo: A particular Edge

Such is the case of the area called ‘El Rodeo’, a plot of 137 hectares in which more than 5.000 families have settled illegally during the last 20 years. As in other peripheral areas of the city, living in state of informality is just the first issue. Some of these areas are prone to flooding and others to landslides; there is difficult accessibility; lack of services and facilities; high unemployment rate; drug trafficking; and more recently socio-ethnic segregation towards Venezuelan people.

‘El Minuto de Dios’ (also known as the CMD by its acronym in Spanish), is the landowner of El Rodeo. Currently, the CMD is working hand in hand with the municipality on a project called El Rodeo Regional Agenda, to reduce the conditions of vulnerability of its residents. The main strategies include: the reactivation of the local economy; strengthening social ties of the community; reducing environmental pollution; provide a better education and legalisation of informal settlements. In parallel, the national government is investing in programmes that support entrepreneurship, to balance the decline of micro-businesses during the Covid-19 crisis and helping to reduce the rate of informality in Colombia.

However, none of these strategies include a spatial intervention nor a vision for El Rodeo district in the coming years. Despite the help and good will from the planning office to help in the legalisation process, the municipality has no instruments to incorporate these neighbourhoods into the city, but a set of laws struggling to formalize what is informal by nature. This means that the problem will keep growing, people will keep building the spontaneous city with a later upgrade by the government in services and public goods.

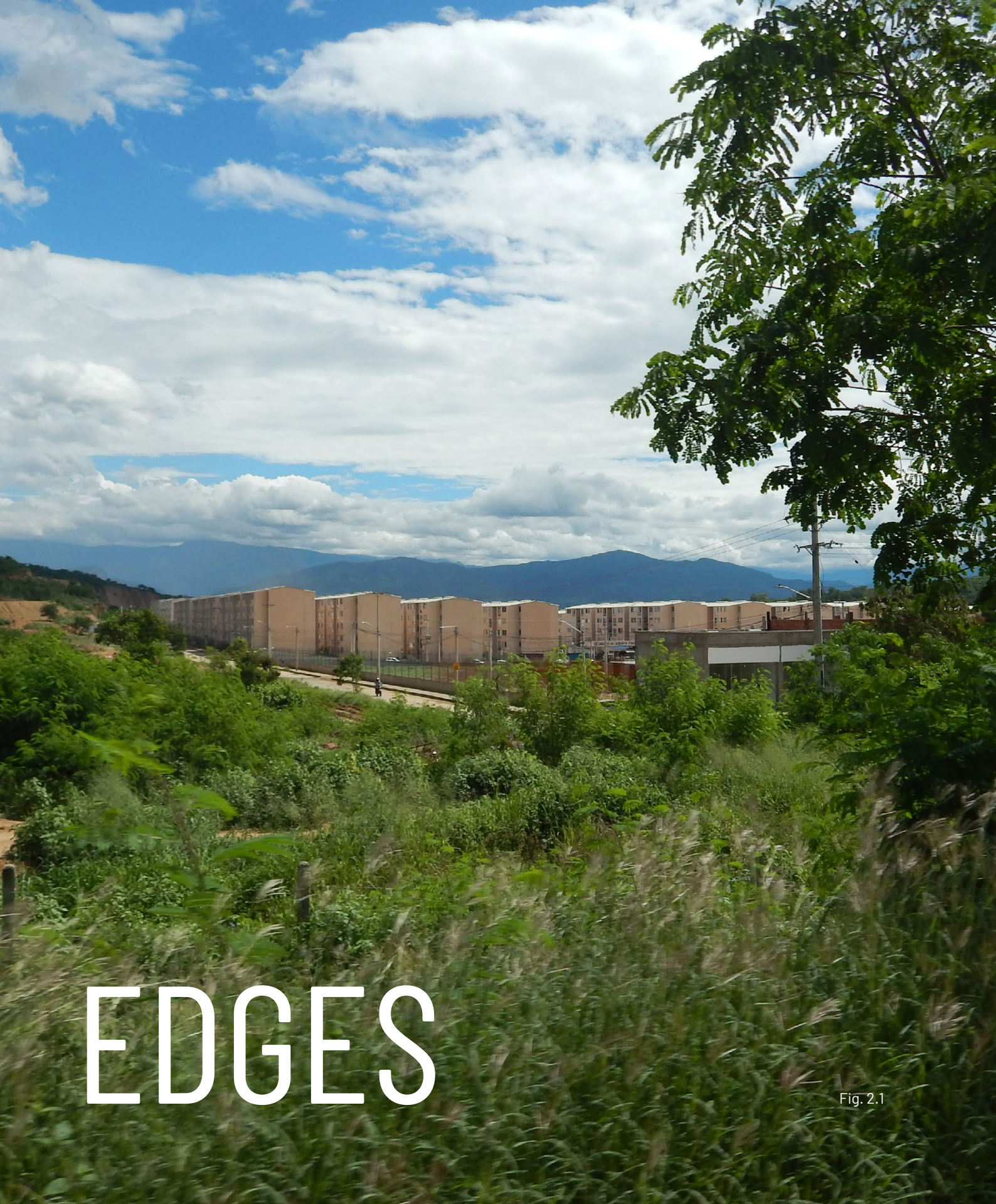
From the urban planning perspective, one of the reasons for this to happen is because the structural plan of the city (POT) is the only instrument that regulates urban growth in Cucuta, and it is unable to cope with all the issues for every planning scale. The lack of planning strategies are evident in the illegal occupation of private property, or what is worst, the occupation of high-risk areas. Cucuta as many other cities in developing countries, has a deficiency of planning from a subsidiarity level, especially in areas of spontaneous development where reality is built day by day.

Therefore, the aim of this research is to explore the process of urbanization on the edges of Cucuta, understand the position of the POT in relation to this topic and propose a set of spatial strategies for El Rodeo. The main outcome of this work can help the CMD to envision El Rodeo and set a base to develop a spatial intervention. Furthermore, it could be used as a feedback for the planning office and inspire interventions in similar contexts.

Some of the topics involved in this graduation project have a long trajectory on academia and practice. Informal settlements, self-help housing, border cities, second-tier cities, social justice, natural disasters, governance. The relevance of this work is the exploration of alternative models of spatial planning, trying to achieve inclusive interventions in the most vulnerable areas of developing cities.

FIG. 1.7 Barrio Bogota, Cucuta. View towards Venezuela. Photo taken by the author, 2020.

FIG. 1.8 Barrio Valles del Giron, El Rodeo, Cucuta. Photo taken by the author, 2020.



# EDGES

Fig. 2.1

## 2 – Research Framework

---

Research questions, methodology framework, first hypotheses and expected outcomes.

### 2.1 – Research question

How to achieve an inclusive urban development in the edges of a border city with rapid social and economic transformations?

This question is the main structure that guides this research and comprises a set of sub-questions as steps to address this problem. Some of them are related to the analysis and some others are focused on the design process.

#### Analysis of Cucuta and El Rodeo

---

- 1 What does it mean living on the border? And what are the implications for the urban development of Cucuta?
- 2 How is the process of urban development on the edges of the city?
- 3 What are the strategies of the Structural Plan of Cucuta (POT) to consolidate the edges of the city?
- 4 What are the main urgencies and opportunities of El Rodeo?
- 5 What can we learn from other border cities in similar conditions to Cucuta?
- 6 What can we learn from reference projects and policies to improve informal settlements?

#### Design regarding El Rodeo

---

- 7 Is it possible to plan from the local level to respond to large scale issues?

FIG. 2.1 Villas del Rodeo, Cucuta. Gated community for low-income housing, built on the expansion areas of the city. Photo taken by the author, 2020.

### Other guiding questions...

- What if Cucuta manages to coexist with risk?
- What if Cucuta has efficient accessibility at its edges?
- What if Cucuta has a stronger network of local centralities?
- What if Cucuta promotes alternative solutions to upgrade informal settlements?

## 2.2 – Methodology

The methodology is based on the European Post-Master in Urbanism approach, in a process of abduction from the problem to the solution, passing through different scales and phases and ‘sharpening decisions through a continuous interaction between analytical and design thinking’ (Nijhuis 2020). At the beginning of the research, I had a structured framework that was successful in previous works. However, at the moment of organizing the information, it became difficult to follow this structure. The social and physical conditions of Cucuta are in constant fluctuation and therefore require an open framework to analyse the complexity of the territory. Then, the following structure appeared as the most suitable version:

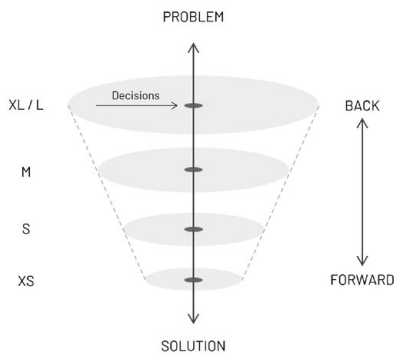
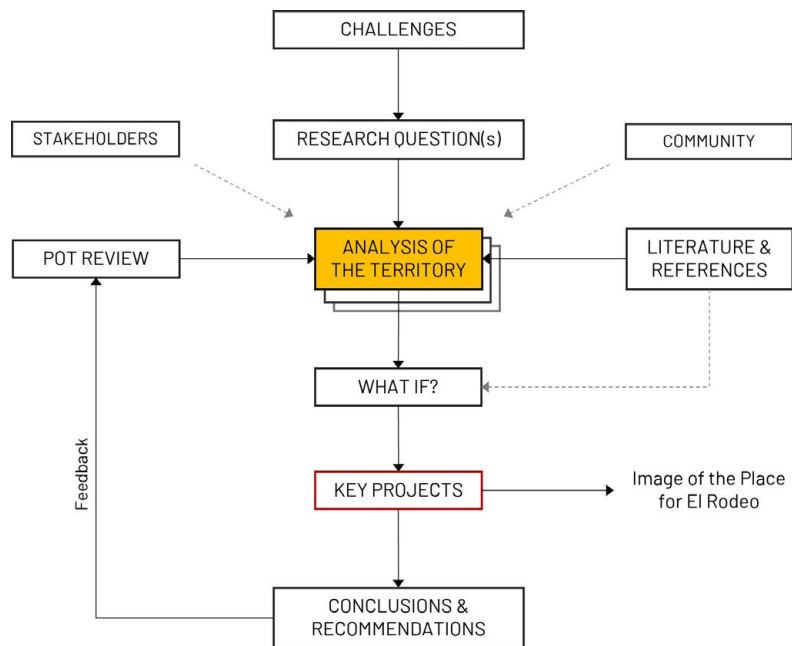


FIG. 2.2 (Above) Process of abduction from the problem to the solution, passing through different scales and phases. Based on (Nijhuis, 2020), interpreted by the author.

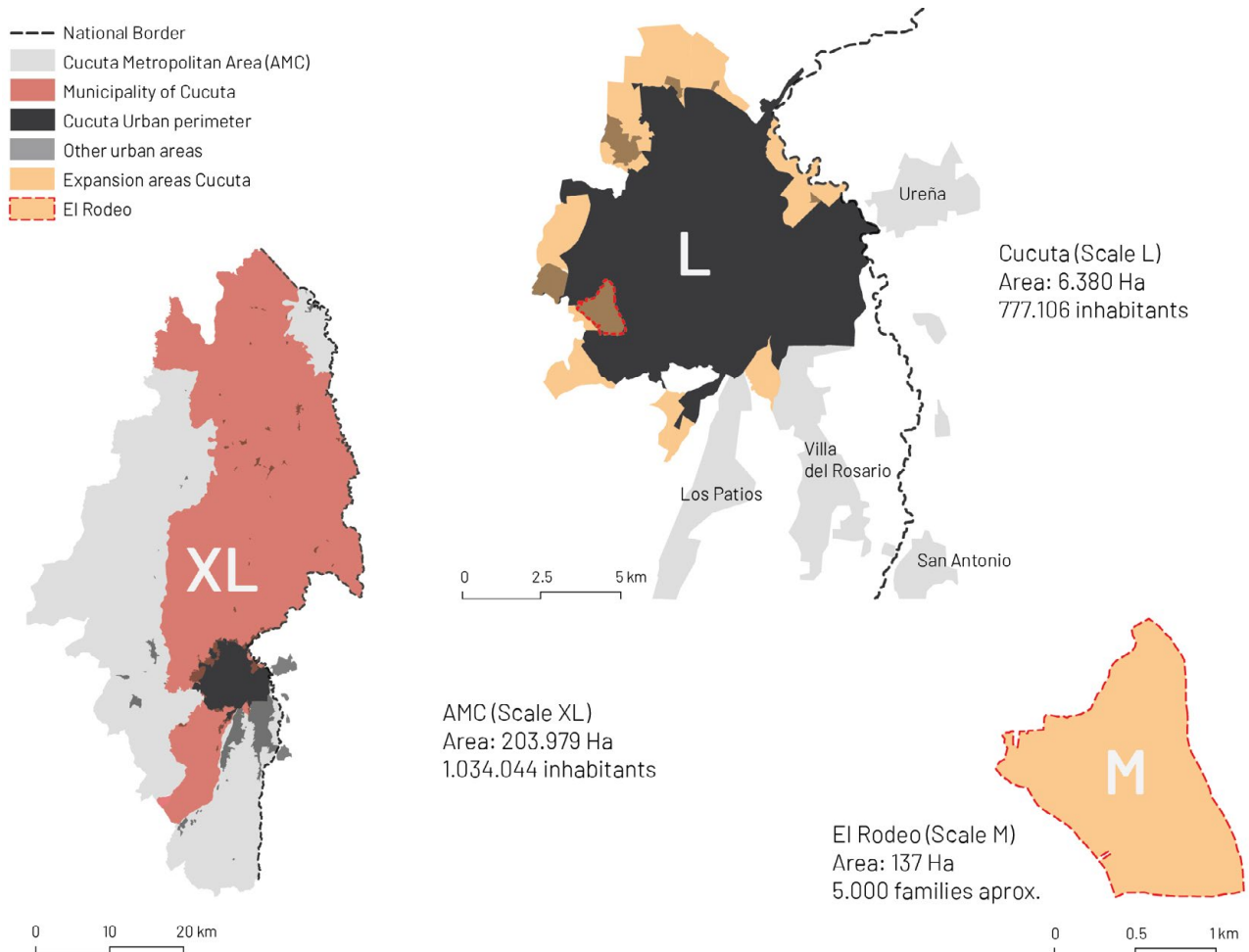
FIG. 2.3 (Right) Methodology framework used for this research. Developed by the author.



This framework gives the possibility to work at different scales simultaneously, taking decisions to inform the design proposal. In the vertical axis are the stages of the process, from the analysis to the research-by-design and conclusions. In the horizontal axis are the parallel processes based on mixed methods of research (quantitative and qualitative methods), moving between data collection, analysis and interpretation (Creswell, 2009).

The multi-scalar approach is based on three scales. The first scale focuses on understanding the context: Cucuta, the border and the region of Norte de Santander (XL and L), the intermediate scale is the analysis of El Rodeo and the exploration of scenarios (M), while the lowest scale (S) is the application of strategies in two key projects in El Rodeo.

FIG. 2.4 Multi-scalar approach. Developed by the author.





The report is structured in four parts: definition, multi-scalar analysis, research-by-design and closing. The first part explains the problem and how to approach it. The second, explores Cucuta and El Rodeo through the concepts of borders and edges, finding correlations with case studies and testing theories. In addition, there is a review of the POT to understand the current model of urban growth. The third part is a scenario exploration by topics, the development of two key projects and a set of recommendations for the POT. The last part corresponds to the reflection and the appendix, which includes all the transcripts from interviews that support this paper.

It is important to mention that as the process of abduction is not linear, the structure of the report does not necessarily correspond to the order in which the research was developed. The methods used through this investigation can be described as mixed methods of research, as they move between quantitative and qualitative approaches. In order to address each of the research sub-questions, one or multiple methods were used to provide the best results as clearly as possible.

FIG. 2.5 Diagram explaining the methods used for each research sub-question and the reasons to address this topics.

Research sub-questions	Methods	Why?
1. What does it mean living on the border?	Data collection; mapping tools; timeline, analysis of main trends and video.	The different methods are used to understand how global issues affect the urban growth of Cucuta, related to the fluctuations of the border.
2. How is the process of urban development on the edges of the city?	Layer analysis of Cucuta; mapping the main trends of the territory; further analysis of El Rodeo (one of the edges of the city).	Analysing Cucuta's urban growth at different scales in order to understand its social and physical boundaries.
3. What are the strategies of the Structural Plan of Cucuta (POT) to consolidate the edges of the city?	Review of the POT and confrontation with the layer analysis; study of the legalisation process and improvement of informal settlements, using El Rodeo as an example.	The confrontation between the POT and the reality in the fringe areas of the city helps to understand if Cucuta has an inclusive planning. What is the aim of the Plan and what are the weak points?
4. What are the main urgencies and opportunities of El Rodeo?	Workshops and interviews; layer analysis; mapping the phases of development of El Rodeo.	The analysis of the social and physical conditions of El Rodeo would determine the strategies to use for the design exploration.
5. What can we learn from other border cities in similar conditions to Cucuta?	Data collection; review of policies and reports of the urban plan of the case studies; mapping tools.	Understand how the permeability of the border affects the urban growth of other border cities. Also, doing a review of their planning instruments in relationship to the edges of the city.
6. What can we learn from reference projects and policies to improve informal settlements?	Study of reference projects; alternative solutions for low-income housing; policies in Colombia and Latin America related to improving informal settlements.	The analysis of reference projects from public interventions to collective initiatives can give an idea of alternative solutions for the edges of Cucuta.
7. Is it possible to plan from the local level to respond to large scale issues?	Scenario exploration; formulation of strategies for El Rodeo, application of the strategies to key projects	The research-by-design approach aims to envision El Rodeo in the future, exploring scenarios related to the topics of landscape, accessibility and centralities. The aim is to bring the planning strategies to the lowest scale.

**Regarding Covid-19.** In addition, doing a master thesis during the restrictions of Covid-19 brings some limitations on the research. According to the theories of Creswell, it is possible to say that the conditions of online studying are more related to the 'Post-positivist World view', also known as science research. In other words, related more to quantitative than qualitative strategies of inquiry, understanding the causes of the problem to determine an outcome, 'observing and measuring the world that is out there' (Creswell, 2009). Even if technology makes easier the access to data, online surveys and virtual interviews are not as powerful as the experience of being on site with the community. This touches another fundamental point of the research of marginal areas, where data is never precise about the real conditions of informality. Fortunately, it was possible to do a short fieldwork with a couple of few interviews and workshops, to get some hints of what it mean to live on the border and understand the main urgencies and opportunities of El Rodeo.

**Initial Assumptions.** At the beginning of this research, there were some initial assumptions about Cucuta's urban growth and the spatial planning in the Metropolitan Area. The idea is to address them through the analysis and the research-by-design. First, during the fieldwork I had the perception that the edges of the city were the most vulnerable areas of the territory, as both social and physical barriers are more evident in the lack of infrastructure, the occupation of high-risk areas and the poor living conditions. The second assumption is related to the planning framework of Cucuta. There is a lack of planning instruments for the lower scale and the POT has no specific actions for the medium and long-term, which hinders the development of new projects, especially in the expansion areas of the city. Having this in mind, the analysis of the territory will focus on the relationship between these topics and exploring its veracity, without forgetting the complexity of the border.

### Expected outcomes

---

There are three expected outcomes related to the scales of analysis and they variate between spatial proposals and recommendations for a comprehensive and more inclusive planning in Cucuta. For the large scale (L): A set of recommendations for the municipality, in relation to the planning framework at the lower scale, with especial attention to the consolidation of informal neighbourhoods. The aim is to inform the POT from an academic perspective and question the disparity between spatial planning and the spontaneous consolidation of the city's peripheries.

For the medium scale (M): Using mixed methods of research, from spatial analyses to the interaction with stakeholders and community actors, propose a set of strategies for El Rodeo. These strategies could lead to a further local plan developed by the municipality of Cucuta or small-scale interventions, with a better understanding of the territory. Furthermore, instead of designing a plan that is unlikely to happen, it is better to portray an 'image of the place' that would help to envision El Rodeo in the future. This would be done by exploring two key projects at the micro-scale (Scale S). One of them related to a public intervention and another to a private initiative, taking as a premise the strategies proposed for El Rodeo.

FIG. 2.6 (Next page) El Rodeo, Cucuta (Barrio Los Canarios) one week after the flooding of November 2020. Photo taken by the author.



# EDGES

Fig. 2.6

PART 2

## Analysis: Borders and Edges

---

Multi-scalar analysis of Cucuta and El Rodeo

**'And while it is isolated by the topography of the rest of the Republic, the Zulia River that runs to the edge of its lands, puts Cucuta in immediate and very easy communication with Maracaibo [Venezuela].'**

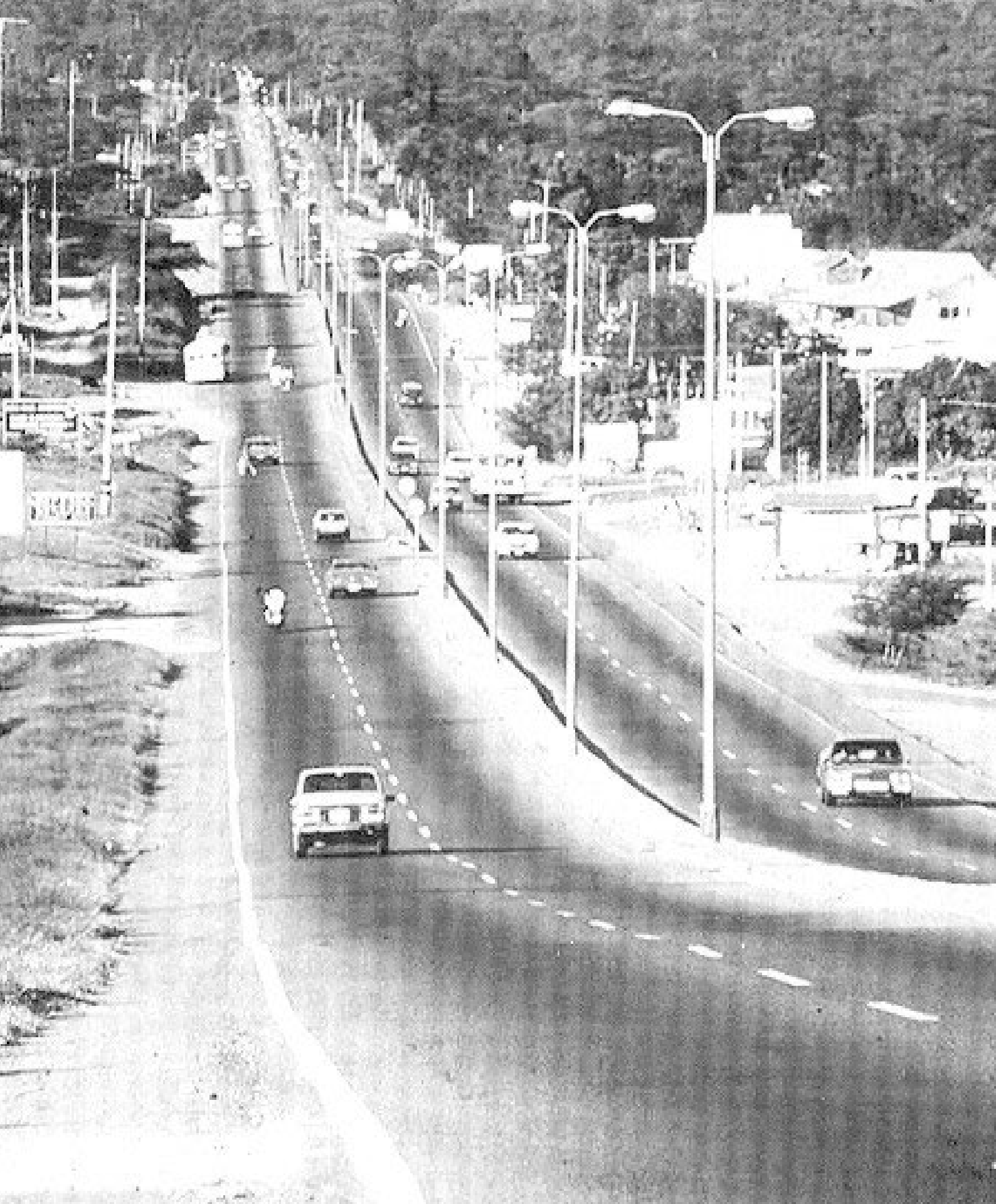
*Vicente Herrera, 1858. Retrieved from Amaya, Villamizar, Puyana, & Gomez (2006).*

**'In fact, all Cucuteños have a Venezuelan relative. The border is imaginary.'**

*Fabiola Garcia-Herreros, (2020). Director of Uniminuto (CMD) in Norte de Santander and inhabitant of Cucuta.*

**'The settlements are located on the leftovers from the official city of planners and developers. Most often, they are pieces of land that are difficult to reach or have complicated and unsafe building possibilities, mostly on steep hills or in areas that are not serviced by primary infrastructures such as water, sewage or even streets.'**

*Gert Urhahn referring to Favelas in Sao Paulo (2010).*



## 3 – Cucuta: a Border City

3 moments in the history of Cucuta can be used to describe the most important shifts in the economy that influence in the model of occupation and the relationship with the border.

FIG. 3.1 (Previous page) Road to San Antonio between Colombia and Venezuela during the 1980s. Source: Cucuta Chamber of Commerce.

FIG. 3.2 By the end of the XIX century the train and the tram used the same railway across the city centre of Cucuta towards the border with Venezuela. Source: Cucuta Nuestra.

FIG. 3.3 Map of Cucuta in 1888. Interpretation developed by the author, based on historical information from multiple sources.

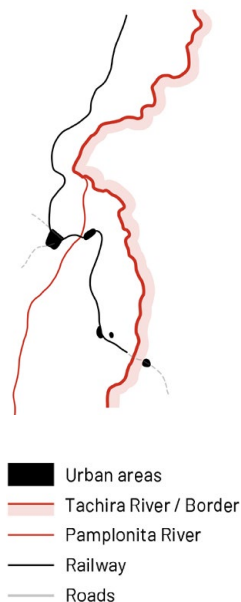


### 3.1 – Historical Background

#### 1888

After the earthquake of 1875, Cucuta was completely destroyed and started a process of reconstruction that took over twenty years. By that time, the Santander region produced 90% of Colombian coffee, but due to political interests between regions it was replaced by cacao and tobacco. In order to stay in the market, it was necessary to export goods towards Europe. Therefore in 1888, Santander completed the construction of a railway to connect Cucuta with Puerto Santander, where goods were transported in steamboats through the Zulia River up to Maracaibo (a port city in Venezuela) and then to Europe. By that time Cucuta had approximately 12.000 inhabitants and small industries were flourishing: milk, textiles, construction, footwear, leather goods, cement, bricks, charcoal, candles, beer, matches and cigarettes.

Moreover, in 1910 the political division of the Santander region between north and south, had a strong influence in the economic development of urban areas. Cucuta became capital of the north and focused its economy on the commercial relationship with Venezuela. Bucaramanga, located on the other side of the Andes Mountains and far away from the national border, focused its attention on the Magdalena River which connected the southern region with the interior of the country and the Caribbean Sea. These and other political decisions juxtaposed by



the topographical conditions determined the first reasons for Cucuta to develop as a border city with high dependency on Venezuela. In 1858, Vicente Herrera, leader and later governor of Norte de Santander described the situation of the city:

*'And while it is isolated by the topography of the rest of the Republic, the Zulia River that runs to the edge of its lands, puts Cucuta in immediate and very easy communication with Maracaibo.'* (Amaya, Villamizar, Puyana, & Gomez, 2006).

Herrera was also the first person to propose the creation of a binational region called El Zulia, from Cucuta to Maracaibo through the Catatumbo River. The region would be free of customs and provide economic benefits to Colombia and Venezuela. However, the idea was rejected by the national government.

FIG. 3.4 First bridge built between Colombia and Venezuela in 1926. The Simon Bolivar bridge was replaced for a wider structure in 1962. Nowadays, over 80% of the Colombian exportations towards Venezuela cross through this bridge. Source: Cucuta Nuestra and Cucuta Chamber of Commerce.

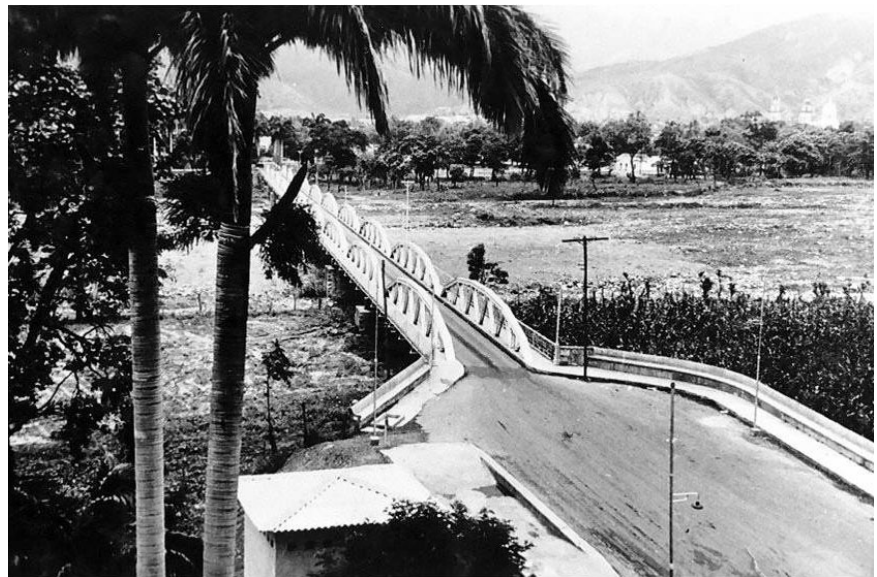
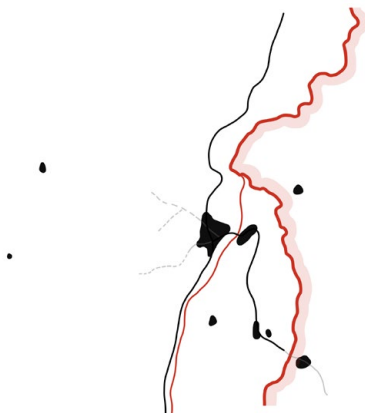


FIG. 3.5 Map of Cucuta in 1943. Interpretation developed by the author, based on historical information from multiple sources.



### 1943

By the beginning of the XX century, petroleum was discovered in the Catatumbo region, at the north of Cucuta. This brought the first forced displacement of an indigenous tribe (Motilon-Bari), reducing their territory. First, a private oil extraction concession was established by General Virgilio Barco, who was in charge of delivering 5% of the profits to the nation. Then, in 1916, treaties were made with American companies to industrialize the process and it was agreed to pay only 10% to Colombia for oil royalties. This oil was exported through Venezuela to the Atlantic Ocean, just as agricultural goods did in previous decades. Despite Colombia's efforts to position itself in the oil market, Venezuela had already the largest exportations of petroleum in Latin America. This oil boom meant a large migration from Colombia to Venezuela and despite the brotherhood ties across the border, high taxes to transboundary commerce created a rise of informal economy.

In order to keep competitive prices in oil exportation, Norte de Santander built in the 1930s the first oil pipeline between Tibu, in the Catatumbo region and Coveñas, a port in the Colombian Caribbean coast. In 1943, the biggest oil well was discovered in the region, boosting the economy of Cucuta where mining industries related to the extraction of charcoal and construction materials (clay and sand) were developing. During this period, the town of San Luis to the east of the Pamplonita River became part of the municipality of Cucuta, rising to a population of approximately 60.000 inhabitants.

The oil extraction boosted the economic growth of the region but harmed other sectors of development. The introduction of the car and later the public transport solved most of the obstacles of topography, but also replaced the trains and the tramway. This led to a decrease of the industries and the rise of the commercial sector. Today, Cucuta has one of the largest industries of bricks and claddings in Colombia and one of the few factories that remain open in the city.

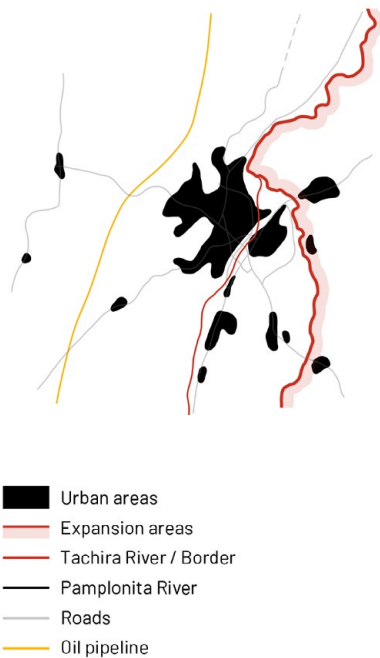


FIG. 3.6 Map of Cucuta in 1986. Interpretation developed by the author, based on historical information from multiple sources.

FIG. 3.7 (Right) 'Desplazados': Internal displaced people from San Calixto, a town in the Catatumbo region. According to United Nations, nearly 400 farmers had to abandon their homes in San Calixto due to the confrontations between the military force and the ELN guerrilla in 2018. Source: elpais.com.



### 1986

The third time frame starts in 1986 with the completion of the oil pipeline, known as 'Caño Limón-Coveñas' between Arauca in the southeast of Colombia and the Caribbean Sea, crossing Norte de Santander. Oil extraction brought benefits to the nation but not many for local people. The guerrilla group known as FARC-EP took military power of the Catatumbo region, with the excuse of being against oil extraction and the protection of civil rights of native communities. But in reality, they were behind the control of coca crops and drug trafficking across the border, doing terrorist attacks and creating forced displacement. Plantations of coffee, tobacco, and other vegetables were promptly replaced by coca and cannabis crops,



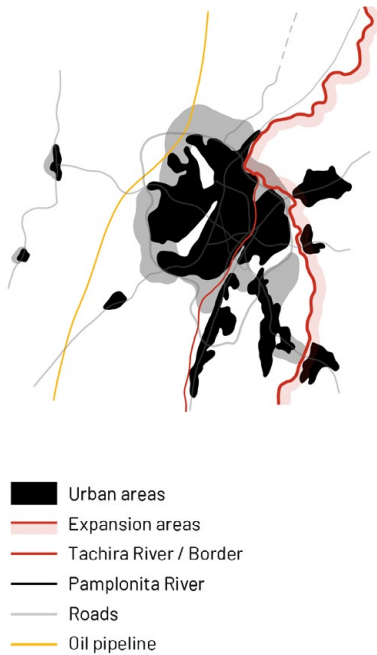


FIG. 3.8 Map of Cucuta in 2020. Interpretation developed by the author, based on layers from IGAC, OSM, POT Cucuta and historical information from multiple sources.

**≈2M** Venezuelans  
**56.2%** Irregular  
 1% remain in Cucuta

**+8M** IDP  
**+100,000** from Catatumbo

as they grew faster and generated better profits. Some farmers had to leave their lands by moving to urban areas after being threatened or losing their families. Some of them moved to Cucuta and others to Bucaramanga, but the vast majority moved to Bogota searching for better opportunities. Unfortunately, this is an issue that still happens in 2021. After the peace agreement between the government and the FARC group, paramilitary forces took control of the region, which is still in dispute between two main groups, AUC and EPL. Moreover, military pressure and the denial of the peace agreement by the government of Ivan Duque have augmented the problem.

Another important fact that happened during this period, was the constitution of the Metropolitan Area of Cucuta or AMC (as per the Spanish acronym) in 1991. The Metropolitan Area was intended to be an informal planning institution that would help to coordinate decisions related to public works in Cucuta and 5 other surrounding municipalities. However, the first Structural Plan for Cucuta (POT) was developed until 2001 and the AMC had no vow on it<sup>1</sup>. One of the main topics discussed in this plan was the rapid growth of informal settlements on the edges of the city and how to address the conurbation of Cucuta with Villa del Rosario and Los Patios. In the meantime, the low skilled population from rural areas had to find means of living through smuggling of gasoline and other goods across the border.

### 3.2 – Current Trends

#### Migration

Since the beginning of the Venezuelan crisis, over 4.5 million people have left their country, from which 2 million remain in Colombia and only 1% in Cucuta (UNHCR, 2020). These migration flows through the city reflect a lack of opportunities on both sides of the border due to a dependency on transboundary commerce. At the same time, from the total amount of Venezuelan migrants in Colombia, 56.2% live irregularly. This status becomes a barrier to access formal employment and increases social segregation. In 2021, the government released the Temporary Statute for the Protection of Migrants, which allows them to access legal jobs, health insurance, and pay taxes. However, this policy does not include the participation of migrant communities in democracy, even if they represent almost 4% of the country's population. In addition, while the border with Venezuela has been closed during the last year to control the cases of Covid-19, there are no restrictions for international tourists.

Another important factor related to migration is internally displaced people (IDP). Colombia has more than 8 million IDPs in history, from which more than 100,000 are from the Catatumbo region (CNMH, 2015). Most of them moving from rural to urban areas and finding a place to live on the edges of cities, where living costs are cheaper but also poorer. These people left their homes running from violence and

<sup>1</sup> This topic will be continued in chapter 4, 'Planning framework' section.

**72%** Informality  
**22.3%** Unemployment  
**Transboundary commerce**

drug trafficking. They arrived into complex environments where there is still the influence of armed groups and criminal gangs (BACRIM) to control micro-trafficking in cities. What makes their adaptation to these informal contexts more complex is the presence of Venezuelan migrants in similar conditions, as both receive more rejection from the recipient population. Despite the Peace Agreement of 2016 with the FARC-EP group, the number of internal displacements keeps rising. In 2018, there were around 30,000 new internal displacements in Norte de Santander (IDMC, 2019).

### **Informality**

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A significant part of Cucuta's economy is based on informality, including tax evasion and uncertain jobs. The AMC has the largest rate of informal employment in the country, with 72%, while in Bogota is around 42% (DANE, 2020). This rate is influenced by the low industrial performance of the region (15%) and a high dependency on transboundary commerce and the extraction of non-renewable resources. In 2020, 84% of the exportations of Cucuta were related to coal, which now is in decay with the rapid transition to clean energy sources (Mincomercio; DIAN, 2020). Undoubtedly, informality is worsening with the Venezuelan diaspora and Covid-19, but according to Caracol, this indicator has had low fluctuations since 2014.

In addition, DANE reported that Cucuta has the highest rates of unemployment (22.3%) and micro-businesses dedicated to commerce (40.2%) in 2021. However, it has the most significant number of associative businesses, which demonstrates confidence in collective initiatives. Regarding this subject, the CMD recommends integrating the network of micro-businesses through an 'ecosystem of effective services' to reactivate the economy.

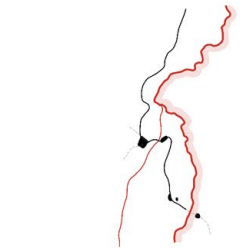
### **Environmental risk**

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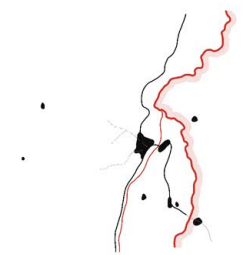
Unfortunately, there is no data about informal settlements in Cucuta. Nevertheless, it is possible to infer a strong influence from the informal economy, as people without legal jobs have no access to housing credits. This correlation is evident in the occupation of high-risk areas by low-income groups, where there is inefficient access to transport, public services, education and spaces for recreation.

In Cucuta, most people live in single houses, representing 73% of the dwelling typologies, which explains the urban expansion towards the city's edges where the land is cheaper. This model of urban growth concerns formal and informal development, affecting the ecological structure of indigenous biomes like the tropical dry forest. According to the Humboldt Institute, deforestation of this ecosystem produces land desertification (Rojas, 2014), worsening the risk of flooding during rainy seasons.

# How do decisions affect Cucuta's urban growth over time?



1888. Railways and agriculture



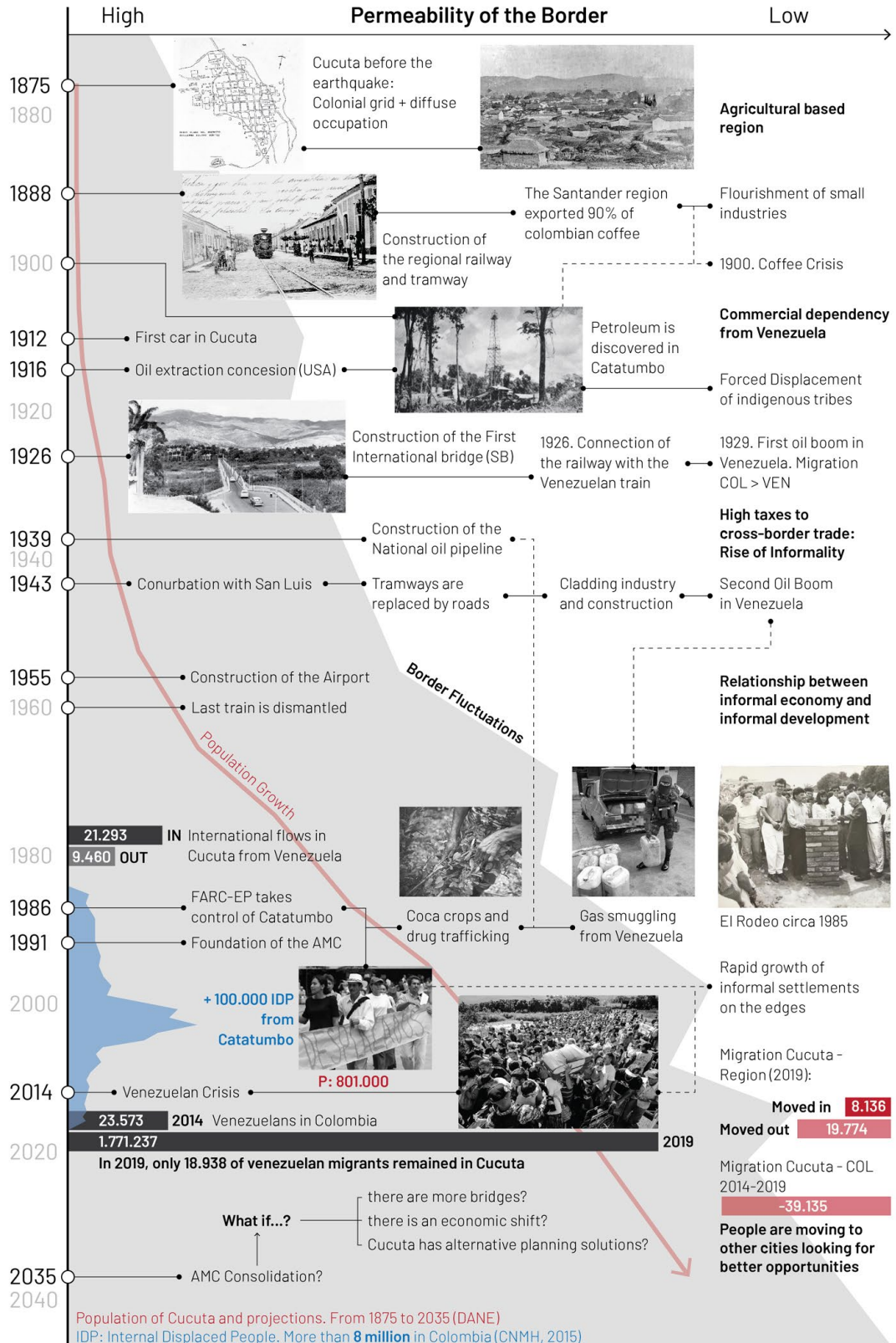
1943. Extractivism and centralization



1986. New infrastructure and new informality



2020. Consolidation of the Metropolitan Area



### 3.3 – Timeline

The timeline is a graphical conclusion of three moments in history that determine Cucuta's urban growth in relation to the permeability of the border. At a first glance there is an evident correlation between the permeability of the border, informality and population growth.

#### **How do decisions affect Cucuta's urban growth over time?**

By the end of the nineteenth century, the economy of the region of 'Norte de Santander' was based on agriculture and the exportation of goods towards the Atlantic Ocean through Venezuela. For this reason, the construction of the railway connecting Cucuta with Puerto Santander was essential for the flourish of commerce and small industries. There was a high permeability of the border with constant migration flows in search of jobs and products, even before the construction of the first international bridge across the Tachira river.

During the following decades, Cucuta experienced the socio-technical transition of the car industry leaving behind the trains. The new vehicles demonstrated the possibility of reaching areas with the most difficult conditions of topography. In the same way, the extraction of oil and other natural resources became an important source of income for the region. But Venezuela became rapidly the biggest competitor in the market and many people from Colombia moved to Venezuela to profit from advantages of the oil boom.

During the second half of the twentieth century there was a steep increase in urban population and a stronger tension between the two national economies, with a consequent rise of informal economy as many families relied on the smuggling of oil and other products. At the same time, the guerrilla groups have been fighting in the Catatumbo region since the 1980s for the control of drug trafficking. This has produced an internal displacement of farmers and native tribes, some of which came to Cucuta in search of opportunities and with no means to afford living in the city. These events had also implications on the built environment as informal settlements appeared on the edges of the city.

More recently, the multidimensional crisis in Venezuela produced a mass migration, that has brought over 2 million Venezuelans and returned Colombians to the country. Some of them remain in Cucuta but most of the people just pass by the city due to the lack of opportunities. However, the communities that had settled on the edges of Cucuta are experiencing more externalities as new foreigners arrive to their neighbourhoods. In the meantime, the border remains closed by the government of Venezuela after the Covid-19 pandemic, while Colombia is trying to reopen its border to help fleeing migrants in the middle of the economic crisis.



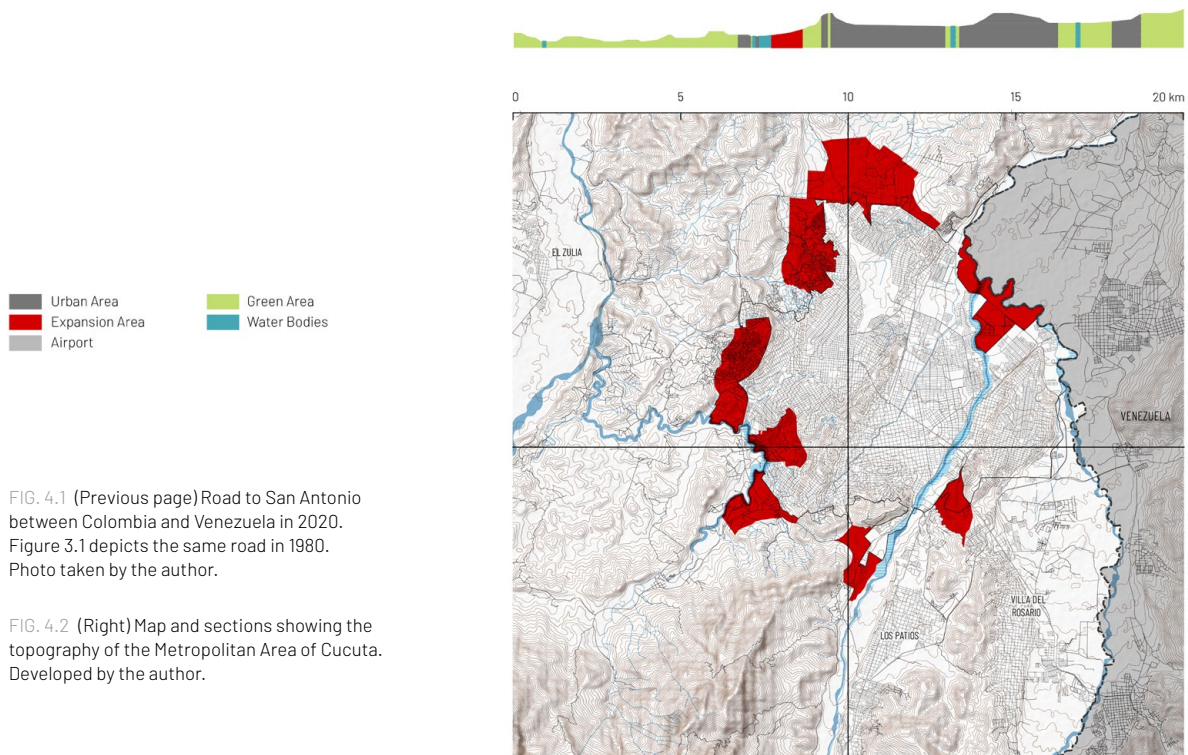


FIG. 4.1 (Previous page) Road to San Antonio between Colombia and Venezuela in 2020. Figure 3.1 depicts the same road in 1980. Photo taken by the author.

FIG. 4.2 (Right) Map and sections showing the topography of the Metropolitan Area of Cucuta. Developed by the author.

## 4 – Edges

### 4.1 – Cucuta and its edges: a critical review of the POT

The intention of this chapter is understanding the planning framework of Cucuta, what is the structural plan proposing for the expansion areas of the city, find contradictions with the current situation and criticise the weak points.

\*The AMC is a decentralized organization that responds to the six municipalities of the Metropolitan Area and is the authority in charge of the public works. Its purpose is to integrate the entire region so that urban networks remain connected. The AMC also leads the Urban-Think Tank, an interdisciplinary group of architects, engineers, and other disciplines to launch new projects around the city. – Bierman Suarez, AMC architect.

**‘The biggest challenge in Cúcuta is planning. There is a POT without a comprehensive nor a structured vision of the city that allows to say: this is the way! This is the future that we dream of.’**

*Miguel Peñaranda, 2020. Director of the Metropolitan Area of Cucuta (AMC\*).*



## Planning framework

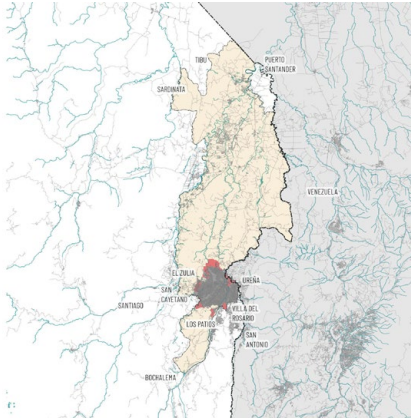


FIG. 4.3 Classification areas of the municipality of Cucuta. Source layers: POT Cucuta, 2019 review. Map developed by the author.

The POT is the structural plan developed in cities and metropolitan areas in Colombia, that defines the management and intervention of the territory. It is divided in 3 components: General, Urban and Rural. The first one is for structuring the long-term planning and the second and third are for the short and medium-term. The original POT was developed in 2001 and according to the law, after 12 years the local administration can formulate a new Plan or do a review of the existing one. In Cucuta, there was an update of the Plan in 2011 and they did a second update in 2019. It considers the area that belongs to the municipality of Cucuta (Rural and Urban), but not the whole metropolitan area of Cucuta, which comprises a group of 6 municipalities in Colombia and 2 more across the border. First, it makes a diagnosis of the current situation and then formulates the strategies that will guide the next 12 years of administration.

Currently, the POT is the only planning instrument in Cucuta. There are no particular plans for each of its districts, but there is an intention to change this framework to plan from a subsidiarity scale. Their plan is to identify homogeneous patterns of occupation (through morphology and typology variations) to propose a particular management for each of them.

# What are the strategies of the Structural Plan of Cucuta (**POT**) to consolidate the edges of the city?

FIG. 4.4 (Previous page) View of Cucuta from its edges. Photo taken by the author.

FIG. 4.5 Informal settlements in the edges of Cucuta during the 1980s. Source: Chamber of Commerce Cucuta.

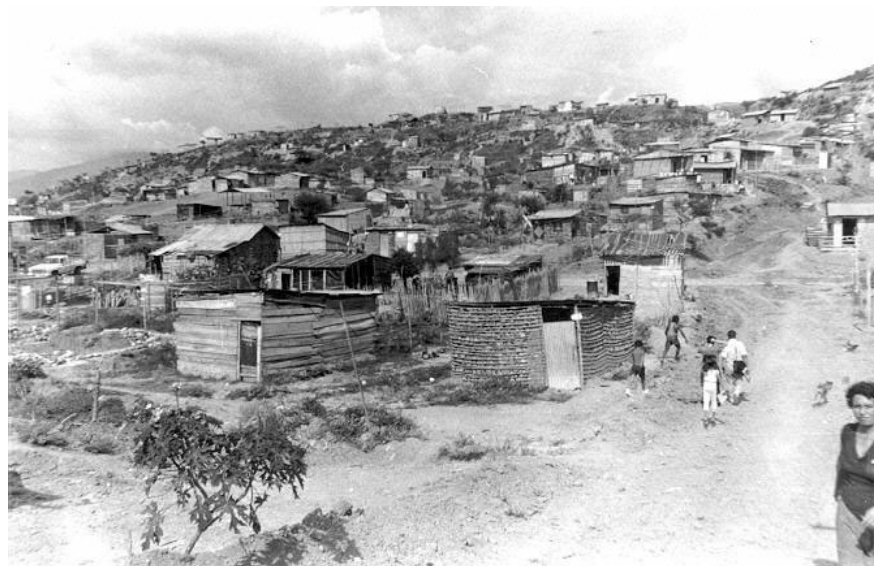
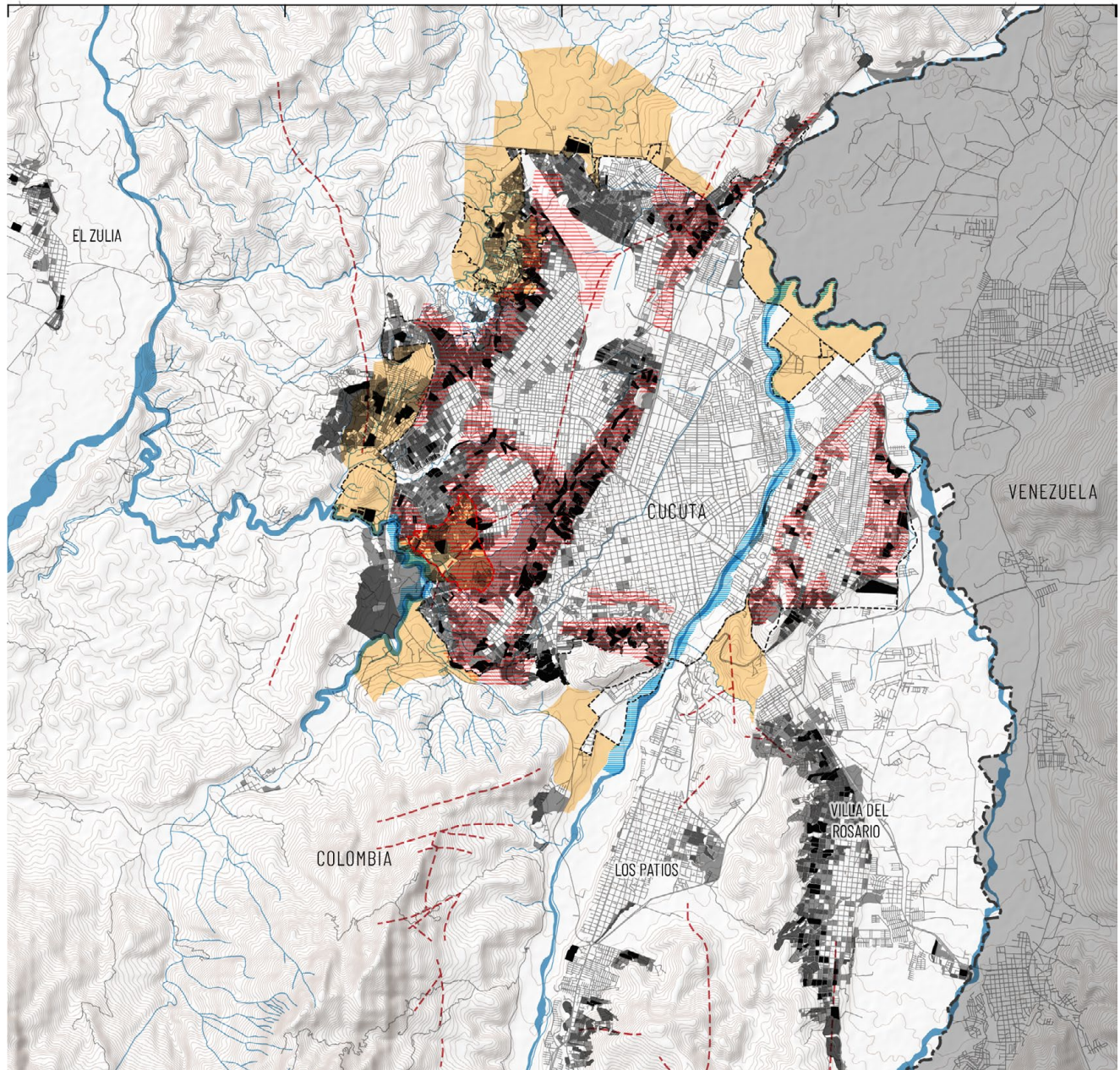


FIG. 4.6 (Next page). Map of risks and low-income households in Cucuta. Source layers: Socio-economic stratum 1 (DANE statistics); roads (Open Street Map); topography (USGS); border, expansion areas of the city and risks (POT Cucuta - IGAC). Map developed by the author.





- Border
- Topography
- Rivers
- Roads
- |     |   |
|-----|---|
| - + | Number of households in socio-economic stratum 1 (very low-income households) |
| ■   | Expansion areas of the city   |
| ▨   | Geological Faults   |
| ▨   | Landslide risk  |
| ▨   | Flood risk  |

The map of Cucuta illustrates the correlation between environmental risks and low-income communities in Cucuta. The layer of socio-economic strata is a classification of housing used by municipalities in Colombia to determine the economic capacity of households in order to pay for public services. In the case of Cucuta, the strata layer shows an evident spatial segregation between groups. The cluster of Stratum 1 (lowest income group) is concentrated on the edges of Cucuta. This means, in peripheral areas or in steep slopes, with poor accessibility, lack of infrastructure and prone to high risk.

A brief analysis of the challenges identified by the POT and the strategies that shape the current vision of the territory.

## Landscape

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This layer includes two topics in the POT: The ecological structure and the risk management of the territory. The Plan is in charge of doing a constant review of the protection areas of the municipality, 'ensure areas for ecological connectivity and provision of ecosystem services, climate change adaptation programs. As a consequence, the main strategy is to 'recover and reforest areas in high non-mitigable risk and protect the urban areas that are part of the ecological structure' (POT, 2017:3.3). Unfortunately, apart from the challenges and strategies, one of the few projects described in the Plan is the linear park along the Pamplonita River.

## Risk management

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This section is in the middle between landscape and occupation layers and how they affect each other. According to the POT there are areas in threat (amenaza) and areas in risk (riesgo). The main difference is that the former ones are void areas prone to flooding or landslides, while the latter ones have settlements in danger. 'Carry out urban control with monitoring tools on areas with informal development, in order to identify constructions in areas of high threat and non-mitigable risk' and the consequent 'relocation of the affected homes'. The municipality is also aware about the urgency of doing geotechnical studies in order to identify which areas are suitable for development, but this is still a measure 'to be considered'. In 2017, risk areas represented 8.12% of the total urban area, between flooding and landslides. Last year after the Iota storm there was a steep increase of affected neighbourhoods in the western edges of the city, where the Tonchala creek lost its course, affecting both, formal and informal neighbourhoods.

The POT also identified areas of special environmental importance that are not well connected through the city, affecting the continuity of the biophysical values of the territory and the habitat of other species. Some of the strategies mentioned in the plan intend to: Formulate a general plan for erosion control and stabilization of critical slopes; develop a system to monitor natural disasters; develop an environmental education process to create awareness towards the preservation and conservation of strategic ecosystems with a focus on climate change; invest in infrastructure to mitigate this issue. However, none of these strategies are going to stop the problem. If nature is conceived as a risk, it will be difficult to live in harmony with the environment without relying on infrastructure.



FIG. 4.7 Formal developers are also building on areas prone to flooding. The Condominium called Arrayanes is located in the banks of the Tonchalá Creek and was affected by the flooding of November 2020. Source: Noticias RCN.

FIG. 4.8 Arrayanes condominium from the ring road. Source: photo taken by the author.

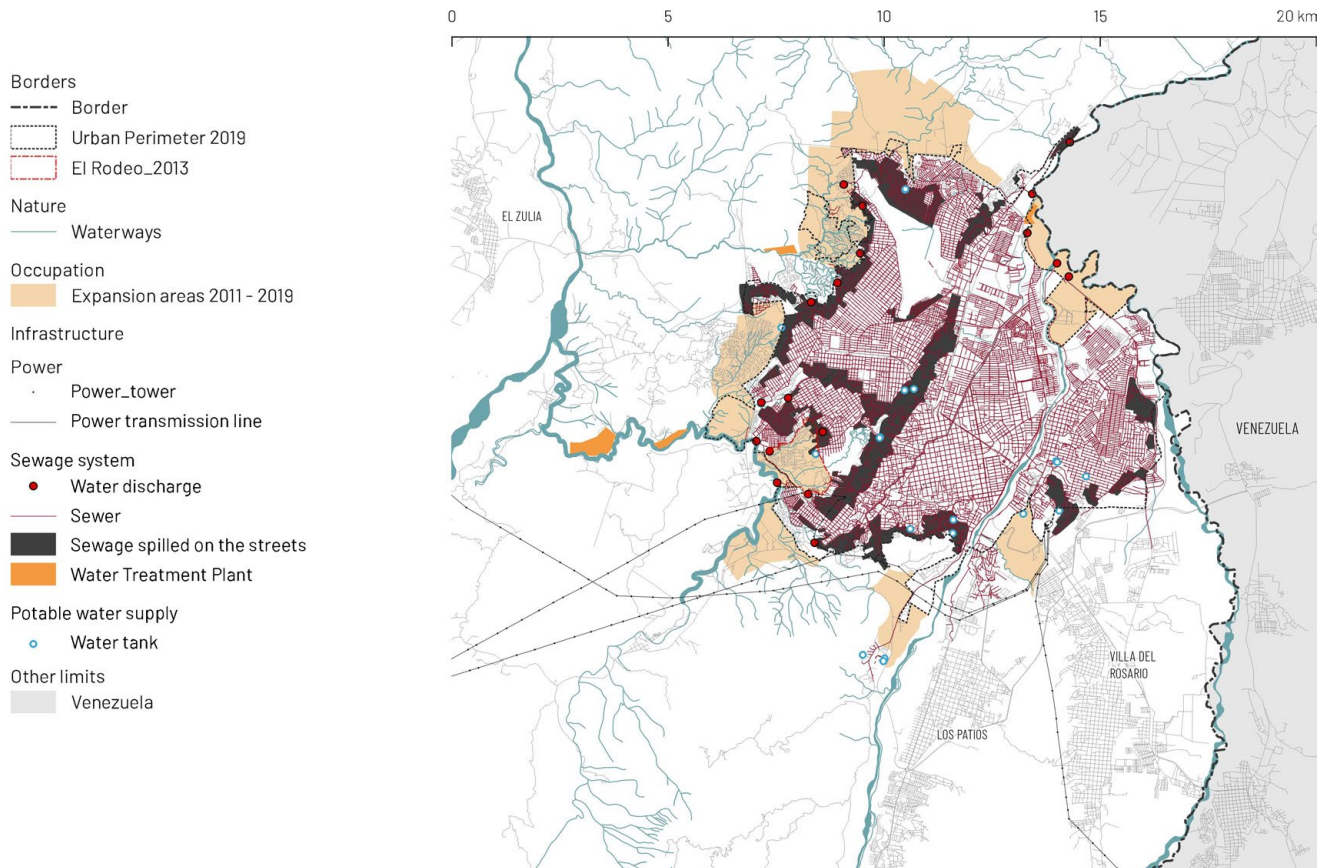


FIG. 4.9 Map showing some of the technical networks of the AMC. The sewer system with the wastewater discharges on water bodies is the most alarming element. The second element highlighted on the map are the water tanks that supply potable water to the city. The adaptation of these elements is one of the proposals of the research-by-design. Developed by the author. Source layers: POT Cucuta, 2019 review / IDEAM / IGAC / Open Street.

## Infrastructure

There are few infrastructure elements related to the subject of risk management. Instead, most of the infrastructure is focused on water management: the water supply network and the drainage system. It is important to mention that there is a separate system for the disposal of rainwater and wastewater in Colombia. The sewers carry the water to the treatment plants, while the rainwater goes directly into the canals and then to the water bodies. But in the case of Cucuta, sewers discharge directly into rivers, and there are no rainwater channels. This problem is evident since the streets are constantly flooded when it rains, but very few people wonder where the sewage goes. Also, stormwater runoff is one of the most polluted waters, and it is not treated before reaching rivers. This map illustrates how wastewater is discharged into water bodies on the western edges of the Cucuta. In addition, the areas without connection to the sewers are mostly informal settlements prone to landslides.

The current plan aims to build four treatment plants in different rivers affected by this problem.

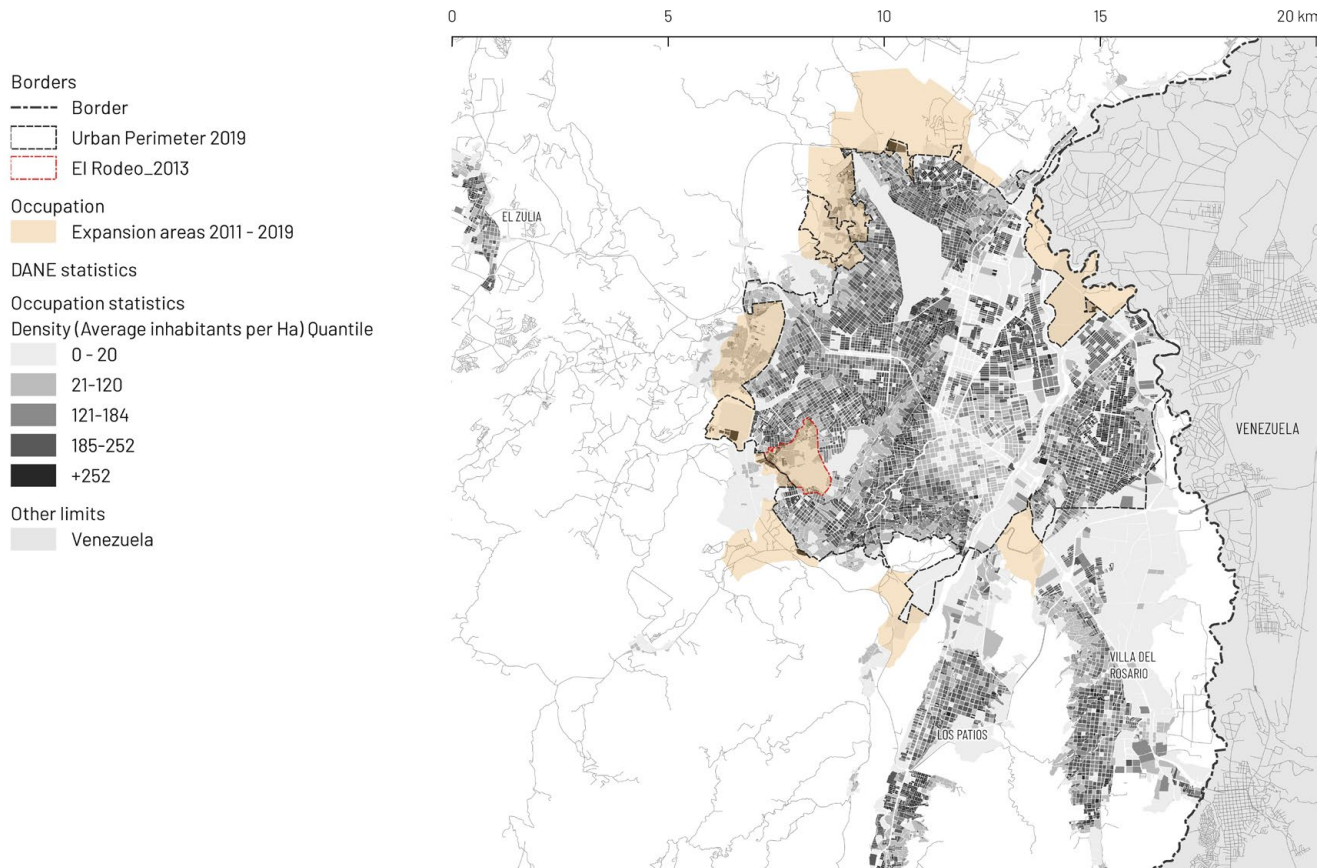


FIG. 4.10 Map showing the average density of inhabitants per hectare. There is not enough information to run a detailed analysis on the density of the built environment. However, this map gives an idea of the population density per block, putting in evidence a low density of residents in the city centre. Developed by the author. Source layers: POT Cucuta, 2019 review / IDEAM / IGAC / Open Street.

## Occupation

The land of the Municipality of Cucuta is classified into urban, rural and urban expansion areas. The urban fabric represents only 5.6% of the territory and the expansion areas are 1.5% of the total. These areas are not agricultural fields or forests as one might think. Instead, they are mostly occupied by informal settlements and gated communities of the so called social housing. According to the POT review of 2011, 78% of Comuna 9 was constituted by informal housing, while Comuna 8 had 70% (these comunas or districts are located in the south west limits of the city).

The current model of urbanization aims to promote a 'dense and compact city, with a sustainable expansion process, that fosters proximity relations of the inhabitants with functional urban supports and that guarantees the efficiency of environmental, physical and territorial resources.' (POT, 2019:3.1). For this reason, the expansion areas are located in the edges of the urban fabric, as close as possible to the existing network of services. Despite their proximity to high-risk areas, they are already in process of urbanization by formal and informal developments. It is important to mention that most of these formal developments are for low-income and 'priority housing'. This means that the population most affected by environmental threats is also the most vulnerable in economic terms. Undoubtedly, this issue increases the socio- spatial segregation in the city.

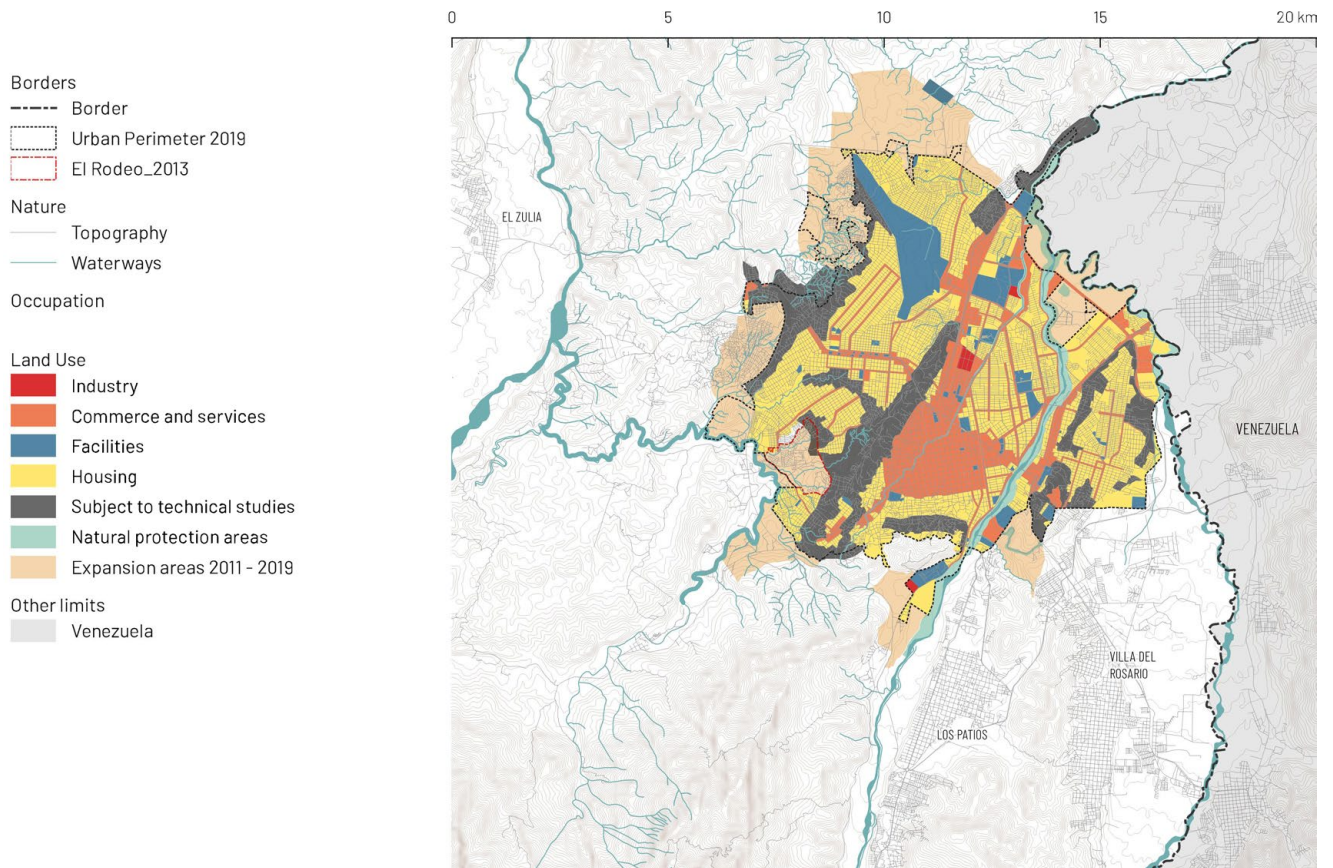


FIG. 4.11 Land Use map of Cucuta.  
 Source layers: POT Cucuta, 2019 review.  
 Adaptation by the author.

'Forced displacement, plus the lack of housing policies and the lack of urban control, have increased the appearance of informal settlements' (POT, 2017:2.1). The Plan also argues that enabling the construction of projects can increase the supply of housing and therefore the reduction of informal settlements in order to control occupation. This shows how the government intends to resolve the issue of illegal occupation by promoting housing projects. At first glance it seems impossible to achieve this, in a city where most of the urban fabric was constituted informally. According to DANE, the Metropolitan Area of Cucuta has the highest rate of informal employment in the country with 72.2% (DANE, 2020), which is not the same as informal occupation, but it certainly has repercussions on the development of the city<sup>1</sup>.

Regarding the existing settlements that are outside the urban perimeter, the Plan suggests that the municipality creates instruments to legalize and incorporate this neighbourhoods in the city. However, the problem here is not incorporating them into the system but their location in risky areas. Although, the current Plan specifies that settlements that are at high risk will not be legalized, which does not prevent more illegal occupation.

#### 4.2 – Vision or ambition?

In general, the POT is not updated to the current situation of Venezuela. It is also possible that the projections for housing and services are not even considering this prominent variable that constitutes one of the hot topics in Colombia today. The Plan does an extensive inventory of the territory layers and determines objectives and strategies for each of them. However, there is not a spatial proposal of how to articulate these strategies through specific actions. Just in specific cases there are visible proposals, such as the cycleways network, which is not a key topic in this chapter. Therefore, the land use and 'urban treatments map' are considered as the principal guidelines to create action plans, both for urban and rural areas. This probably happens because the current planning framework is based on 'traditional planning focused on land use regulations' (Albrechts, 2001). At the end of the POT formulation, there is an execution program with a list of short, medium and long-term projects (4, 8 and 12 years respectively), also classified by topics but with poor explanations (POT, 2019:3.1). Is it possible to have a structural plan without concrete actions? The strategies proposed work as design principles for the development of new projects, but as they are only goals, they can end up being only ambitions.

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<sup>1</sup> There is no exact data about the current number of informal settlements in Cucuta.

### 4.3 – First Conclusions

As stated by Vicente Herrera in 1858, Cucuta has a stronger bond with Maracaibo in Venezuela, than with any other city in Colombia. This is due to the landscape conditions, which have implications in the social and economic aspects of the region. As a result, since the foundation of the two republics, Cucuta has been attached to the border but also constraint by its permeability. During the XX century, the exploitation of natural resources and the control of drug trafficking across the border, discouraged the emerging industries and increased the tensions at the border. Nowadays, Cucuta has become in a transitory city that suffers from a lack of opportunities for its citizens and migrants.

On the other hand, the city keeps growing without a clear model of occupation different from urban sprawl. The Structural Plan is the only instrument of spatial planning for the Metropolitan Area without a clear vision nor specific actions. In the meantime, the city keeps growing on its edges where informal settlements and low-income gated communities are built on areas of environmental risk. Unfortunately, the POT and the instruments to consolidate these areas are based on fixing the problems instead of anticipating them. There is an urgent need to redefine the strategies of the POT and create instruments for planning at the local level with a deep concern on ecological processes.

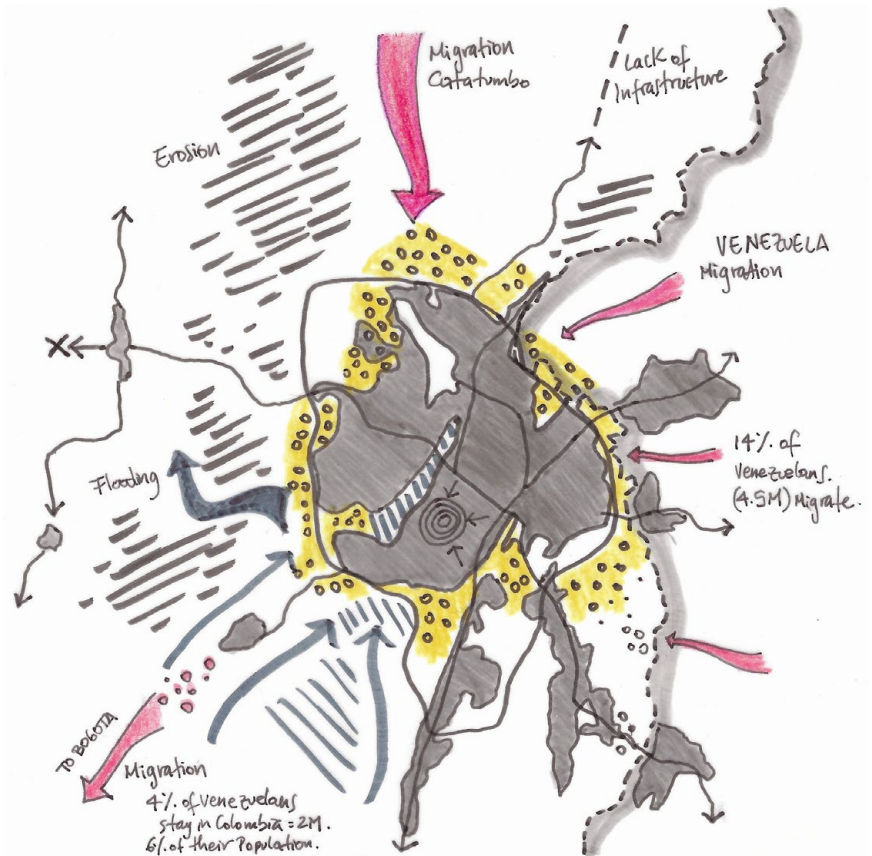


FIG. 4.12 Conclusion map for Cucuta showing the physical and social flows. Drawing by the author.



FIG. 4.13 Venezuelan families camping on the border.  
Photo taken by the author.





FIG. 4.14 Workshop with local leaders and other neighbours in El Rodeo.  
Source: photo taken by the author.

'There is a lack of dreams,  
we have poverty in our minds.'

Martha (CMD member and inhabitant of El Rodeo)

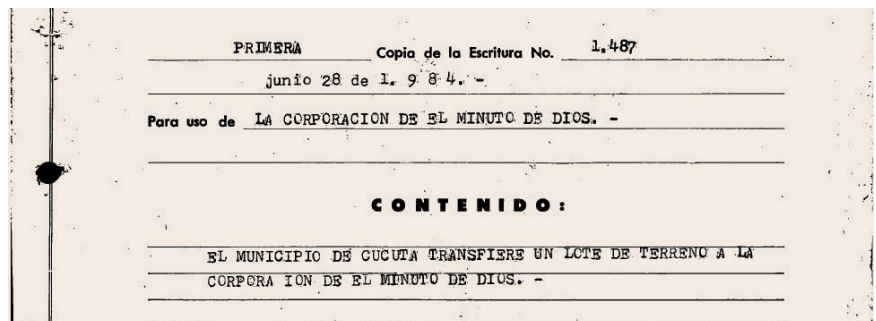
## 5 – El Rodeo: A particular edge

This chapter explores the main urgencies and opportunities of El Rodeo that will determine the strategies to use in the research-by-design.



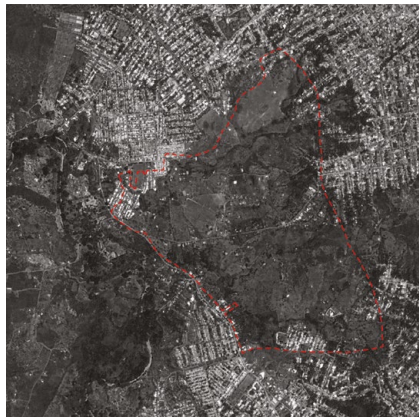
FIG. 5.1 First settlements of El Rodeo.  
Father R. Garcia-Herreros with the local community.  
Source: CMD.

FIG. 5.2 Title deeds of El Rodeo in 1984:  
'The municipality of Cucuta transfers a parcel of  
land to Corporacion El Minuto de Dios'. Source: CMD.

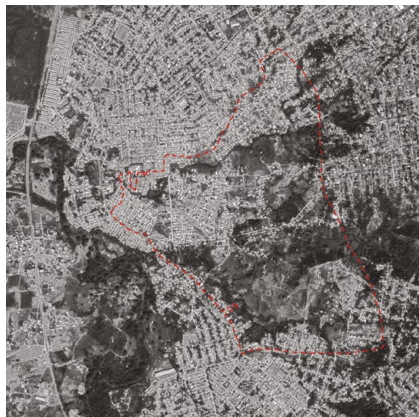




2003



2010



2020

FIG. 5.3 Maps showing the evolution of El Rodeo (red polygon) from 2003 to 2020. Source: Google Earth.

## 5.1 – Evolution of the territory

El Rodeo, located on the edges of Cucuta, is an example of how the informal city grows in developing countries. In 1984, the Mayor of Cucuta gave the parcel of El Rodeo to Father Rafael García-Herreros, founder of El Minuto de Dios organization (CMD). By that time, this land was part of the rural areas of the municipality. It was given as a donation to help the father in his projects of education, social inclusion and community development. It is important to mention that Father Garcia-Herreros was a pioneer in radio and communication technologies. In parallel, he developed different initiatives to help vulnerable families building and financing their own houses. Initially, that was the intention for El Rodeo, building a neighbourhood for low-income groups as they did in Bogota. However, it never happened.

From 1990 to 2010, the story of El Rodeo is blurred. Cucuta grew towards the west, and El Rodeo became an expansion area of the city, also known as Comuna 8. The only certain thing is that the CMD built a school during the 1990s where most kids from the area went to study. Unfortunately, with the implementation of mega-schools<sup>1</sup> in Cucuta, the CMD lost its students, and the school was eventually closed. Since then, the structure has been used as a community centre that offers workshops and social services to all ages.

By 2020, the parcel of El Rodeo had more than 5,000 families grouped in 12 informal settlements. None of them is legal, and most of the people who live here have been scammed by land traffickers, buying individual plots without title deeds. Other groups rent a place to ‘pirate developers’, people involved in constructing and renting illegal premises. This issue of housing and security in land tenure happens all over the edges of Cucuta, where people build their homes and transform their neighbourhoods every day.

By looking into the territory’s evolution, we can infer that the city has developed from north and south towards the valley of Las Brujas, where El Rodeo is located. This valley is the most significant ecological corridor in the west of Cucuta. However, as informal occupation grows, environmental issues also do, affecting the well-being of this community in the process of consolidation.

The next part analyses some of the issues identified at the beginning of this research by comparing mapping and literature review with the outcome of the fieldwork held in November 2020.

<sup>1</sup> Mega-schools were first implemented in Bogota between 2004-2007 and later expanded into other cities. These are large and modern structures that gather 1,500 to 4,000 students and are located in marginal areas of the city. The objective was to fill a deficit in free public education, but over time became a qualitative problem as they are overcrowded, and some still have two school schedules. Some children study in the morning and others in the afternoon (Ovalle, 2018).



2013



2020



FIG. 5.4 (Left-up). 'Sale of cheap lots' by land traffickers in El Rodeo. Source: Google Maps, 2013.

FIG. 5.5 (Right-up). Same house in 2020. Photo: Alfredo Carvajal, CMD.

FIG. 5.6 (Left-down) Main Road in El Rodeo. Source: Google Maps, 2013.

FIG. 5.7 (Right-down) Cleansing service from the municipality working on the same road in 2020. Source: photo taken by the author.

**F: 'How long have you been living in this neighbourhood?'**  
**E: 'Eight years ago. We took this land on June 23, 2012 at 7:45 pm. That was a Saturday.'** Elizabeth as other inhabitants of the area, know exactly when they arrived to their new home, built with their own hands. (Elizabeth, inhabitant of Los Canarios neighbourhood, El Rodeo, 2020).

## 5.2 – Layer analysis

Analysis of the main urgencies and opportunities of El Rodeo using as a base the four urban networks: Landscape, infrastructure, occupation and governance.

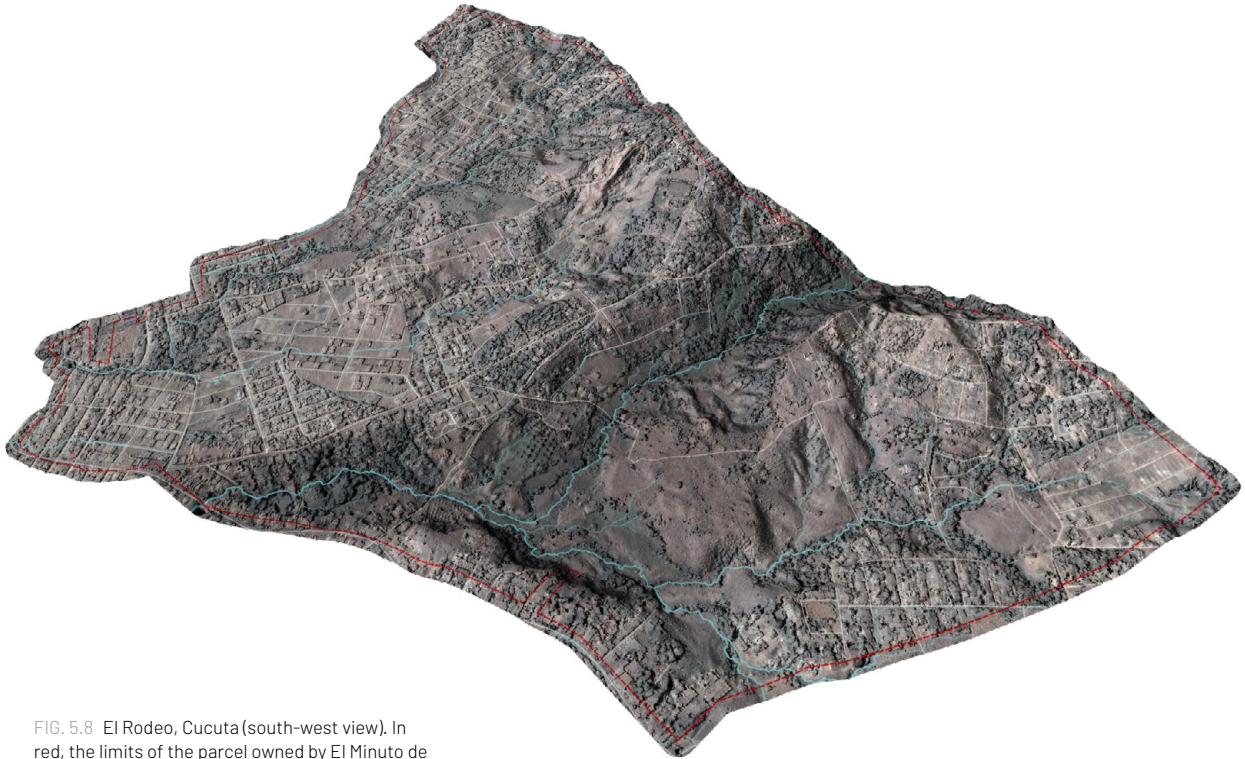
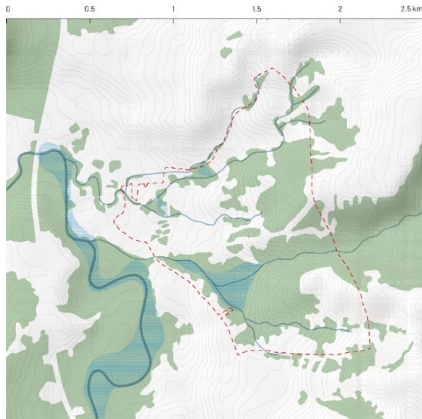


FIG. 5.8 El Rodeo, Cucuta (south-west view). In red, the limits of the parcel owned by El Minuto de Dios. Towards the centre of the valley is 'Las Brujas' creek, which runs from east to west and discharges in its water in the 'Tonchala' creek. This green edge that divides El Rodeo is also the largest corridor that connects the west of the city with the surrounding landscape.

3D model developed by the author with a DEM provided by the CMD and Google satellite map.

**'The urgency of the neighbourhood is the adaptation of the creeks, the installation of gabions to prevent flooding'.**

*Rafael. Inhabitant of Valles de Giron, El Rodeo (2020).*



Green-blue network



Technical networks



Consumption and production network

FIG. 5.9 The layer approach shows the most relevant elements of the urban networks of landscape, infrastructure, and occupation. All maps were developed by the author. Source layers: OSM, USGS, POT Cucuta, DANE.

## Landscape

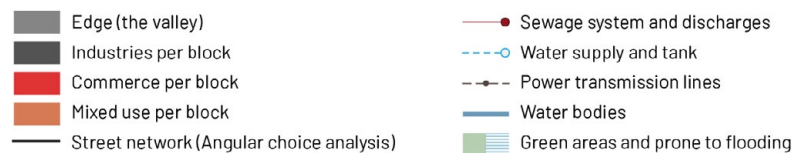
The original landscape of the valley that crosses El Rodeo from east to west was a tropical dry forest. This ecosystem is at risk of devastation as it only remains 8 per cent in the whole country, and in Cucuta, it has almost disappeared. In addition, occupation grows towards the valley, creating a bottleneck on its ecological flows, worsening flood risk and affecting the transit of species. The map on the left illustrates the green areas in 2020 and how green corridors have been reduced into stepping stones. Some of these open spaces are used as pocket parks by the community, and in some others, the residents keep agricultural practices like farming chicken or growing small orchards. Even so, large green spaces become physical barriers between communities as they are usually fenced, and people have no access to them.

## Infrastructure

Following the previous topic, there is a lack of water defence elements in El Rodeo, and the few ones are concrete walls that scarcely support strong runoffs. Like other informal contexts, the community builds illegal supply services with a later upgrade by the municipality to charge them. Almost all the area counts with electric power. Regarding potable water, a large tank on the east of the parcel supplies this service to districts eight and nine. But this is not the case of the sewage system, which discharges wastewater directly into the creeks. This information is part of the POT layers, and it is possibly outdated, yet there are no treatment plants in Cucuta. Finally, what makes the problem worse is the lack of drainage systems for rainwater. As a result, every time it rains, the streets flood.

## Occupation

The map on the left depicts the types of micro-businesses related to housing in the area of El Rodeo. The location of industry, commerce and mixed-use is directly related to the connectivity of the street network. By overlapping the production and consumption network to the space syntax analysis, it is possible to see a correlation between these businesses and the main roads. This explains why there is a gap inside the polygon of El Rodeo (red-dotted line), where streets are incomplete, and the topography is complex. Some of the businesses present in the area are grocery stores, hairdressers, bakeries, auto repair shops, printing and internet services. Cucuta is also well known for manufacturing shoes in small industries, and there might be some of them in El Rodeo as well.







FLOOD  
RISK





### 5.3 – Phases of Development



Phase 1



Phase 2



Phase 3

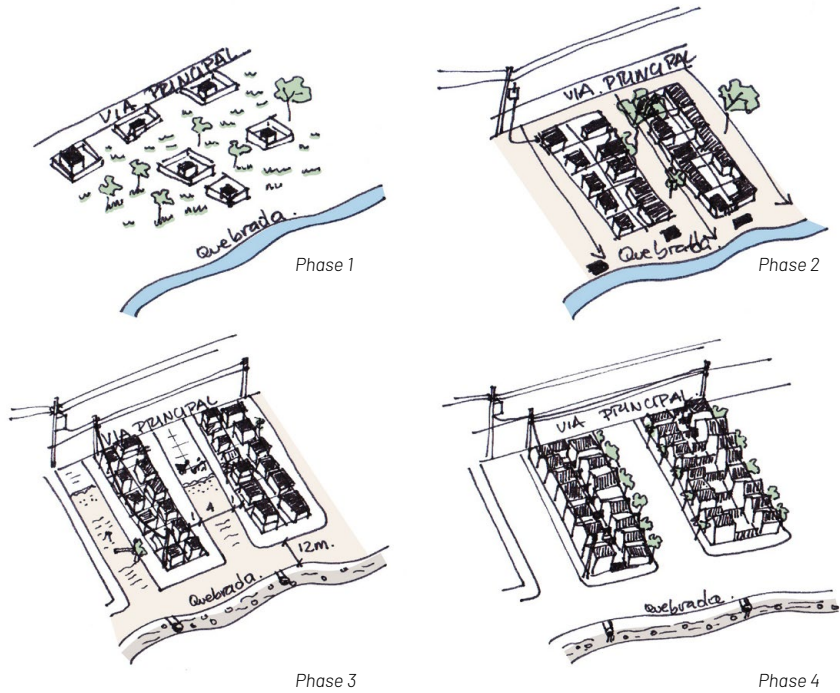


Phase 4

FIG. 5.13 (Above) Pictures showing the four phases of development.

Source: Google Earth, CMD and the author.

FIG. 5.14 (Right). The four phases of development. 'Via principal' is the main road in EL Rodeo and 'Quebrada' means creek. Drawings by the author.



In El Rodeo as in many other edges of the city where informality is the main pattern, it is difficult to classify or explain the phases of development of the settlements, mostly because each plots is built progressively according to the economic capacity of each household. However, in order to define the grade of consolidation of the different settlements it is possible to do an abstraction to give the reader a proximity of the urban fabric by 2020. The classification is based on four phases of development, taking into consideration the materials of construction, access to supply services, number of storeys and constitution of the streets. Again, this exercise is an approximation to reality, based on site visits and an outdated Google street view from 2013.

**Phase 1.** Tents and no services. Delimitation of the settlement with wires and raise of tents with scarce materials. Usually this is done by a community of at least 10 families. They cut trees and organize the plot to locate their future houses. Usually, the tracks or improvised roads are settled according to water runoff and topography.

**Phase 2.** Self-built houses with weak materials. Illegal supply services with hoses and improved sewers. Light is also taken illegally from lampposts. Inhabitants decide on the location of common areas, including streets, parks and pitches.

INCLUSIVE URBAN DEVELOPMENT?

Temporary urbanism of the informal settlement



INFORMAL DEVELOPMENT



TRANSITION TO AFFORDABLE HOUSING FORMAL / "INCLUSIVE" CITY

Fighting to live in dignified conditions, low-income families transform their environment every day. Over time, some of them move into affordable housing to become part of the 'formal city', where gated communities are the primary trend of development.

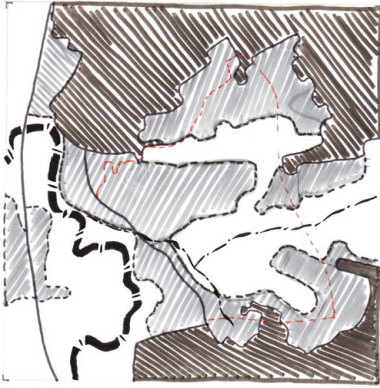
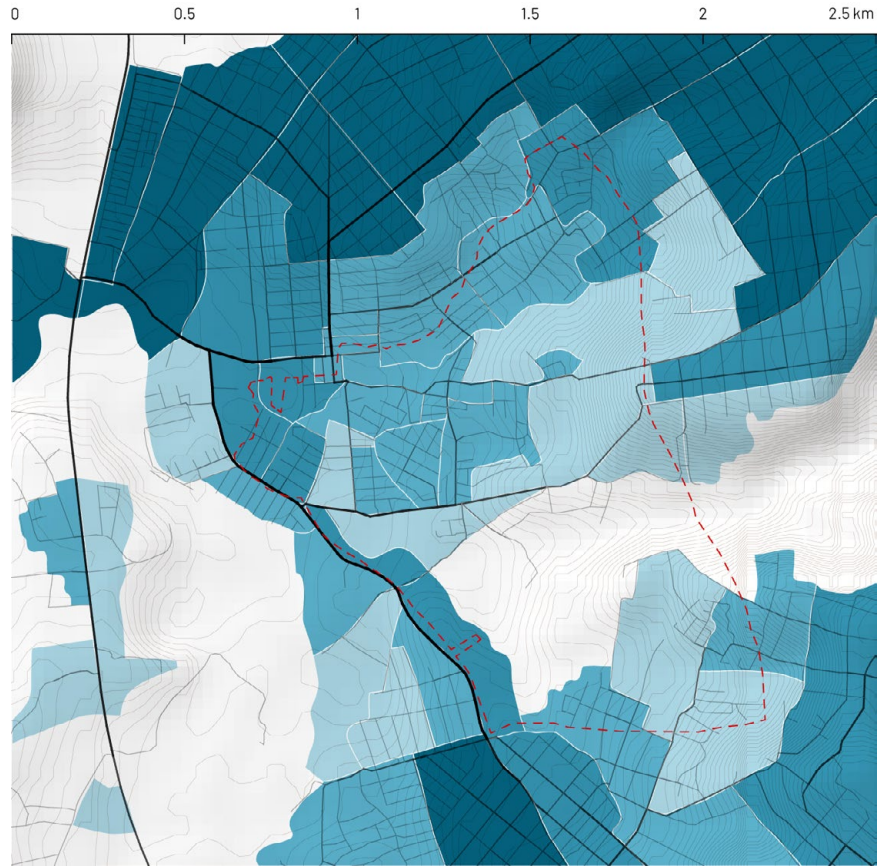


FIG. 5.15 (Above) Drawing of the available information in Google Street View 2013 (Black) and unavailable information (grey), which was completed with pictures taken during fieldwork.

FIG. 5.16 (Right) Approximation map of the four phases of development of El Rodeo. Dark blue are the most constituted settlements.



**Phase 3.** One and two storey houses, in progress of construction. The community raises money to pay an architect or a topographer to trace the roads and sidewalks. Service companies of water and electricity, often help communities with the connection to the main grid. Other times it is sponsored by political leaders, especially to buy votes in popular sectors. However, this practice of service supply is not legally recognized by the State. The neighbourhood must be legally constituted to access services, as a 'measure' to avoid a massive informal development.

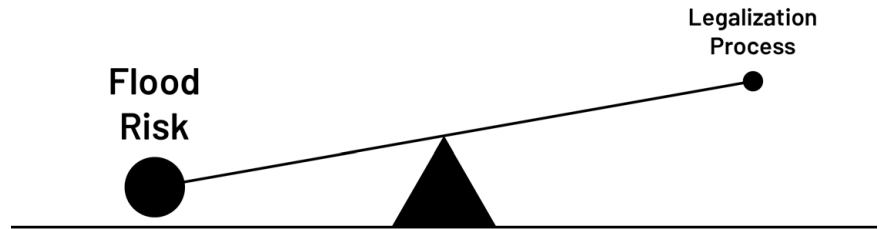
**Phase 4.** Constituted blocks. Most of the houses are built in long-lasting materials (not necessarily with optimal structural conditions), they have access to services and are defined limits between private and public space. Some settlements also have a 'salon comunal', common space of encounter, built by the community for multiple activities. In the case of El Rodeo, some houses and even entire blocks can be classified as in phase 4, some of them own their house and other live for rent, but none of them owns the land. Some residents have been living in El Rodeo over 25 years and still have no security in land tenure.

This exercise helps to illustrate that the oldest settlements are more constituted than the new ones. However, the houses located along the main road that connects north and south districts, have a major development associated to local businesses.



**'They told us that there couldn't be Venezuelans in the neighbourhood because that was detrimental to the legalisation process of our settlement.'** *Elizabeth, inhabitant of Los Canarios, El Rodeo (2020).*





**'The community is not as interested in legalization as in living with dignity'**

- Alejandra Bermon. Legalization process team (CMD). El Rodeo, 2021.

### Legalisation Process

The strategy called 'Building Friendly Cities' estimated that 1.3 million households live in informal settlements in Colombia (CENAC, 2018). Despite not being the most critical problem for low-income families, the legalisation of properties does allow them to access other services and financial credits. El Minuto de Dios organisation is working on the legalisation process of El Rodeo settlements to help these families improve their living conditions.

The process has two phases: the legalisation of informal settlements and the issuance of title deeds for each house. Because El Rodeo is composed of 12 settlements, the CMD as landowner of the parcel needs to ask the planning office for a subdivision license to start the process. Legalising each settlement involves three steps, social, technical and legal.

**Social.** The CMD needs to define the limits of the settlement. Then they characterise the families, including their living conditions, and inform the community about the intention of turning the settlement into a constituted neighbourhood.

**Technical.** To continue with the process is mandatory to analyse the soil conditions through topographical, geological, and hydrological studies. In this part, engineers determine if the area has environmental risks. If the soil is in good condition or at low risk, it is possible to continue legalisation. If there is no possible risk mitigation, the process is over, and families need to relocate, which can take many years to happen.

After delivering the technical studies, the municipality needs to approve the settlement's urban proposal or 'regularisation'. This includes a set of maps to define: private and public limits; the section of the streets; parks and open spaces; risk of flooding and landslides; land use; facilities; services; maximum heights and density of the plots. In most cases, the community has already defined these areas, so the role of the planning office is legalising an existing reality.

**Legal.** The planning office issues a decree to incorporate the settlement to the city and approves the regulations for future developments.

FIG. 5.17 (Previous page) Inhabitants of El Rodeo.  
Source: CMD.

The legal instruments used for the legalisation process are CONPES 3604 of 2009, Act 564 of 2006 and the law 2044 of 2020. The first is the policy that defines the

guidelines of the Comprehensive Neighbourhood Improvement Programme (MIB), 'aiming to reduce poverty through physical and legal actions to integrate informal settlements into the city's structure'. The second law regulates the legalisation of informal settlements. The third and most recent law determines that informal settlements with an occupation longer than ten years should receive property rights over the land, as long as these areas are free of risk.

'In the field visits, free zones, streets, existing facilities are detected by the municipality. As they are very old invasions, there are already places that the community has defined for common use. **"Nobody invades this lot because it is the park"** - says the community. What we do is legalize an existing reality. And where there are no common spaces, we have to make space for them.'

*Cristina Santos (2021). Head of legalisation process (CMD)*

### Limitations of the process

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However, the legalisation process of El Rodeo has many constraints. For instance, if the technical studies dictate that part of the settlement has geological issues, the planning office will put on hold the legalisation of the whole settlement. That is the case in 'Juan Pablo II', where 90% of the process was already completed. Another issue is dealing with the settlements located on the limits of the CMD parcel. El Minuto de Dios can only legalise the land and buildings that are on their property. This affects houses that are not entirely inside the lot.

In addition, according to law, the municipality must take care of each part of the process. However, due to a lack of resources and public servers, the CMD guides the project. International organisations like the UN Refugee Agency (UNHCR) and the German Cooperation Agency (GIZ) are also helping with the funding of technical studies.

But the most complex part, according to Giovanni Bolaños, Director of the CMD in Cucuta, is the 'micro-political populism'. Some of the community leaders have individual interests against the process and have a strong influence within neighbours. For example, Valles del Giron settlement has severe flooding issues, and community leaders think that stopping the legalisation process will make the government solve the water issue. Therefore, the legalisation process also depends on the goodwill of the Community Action Board (JAC after its acronym in Spanish).

A more recent limitation for the legalisation process is related to the Venezuelan residents without a legal registration in the country. During an interview with 'Elizabeth', one of the local leaders in El Rodeo, she said that public officers of the planning office and other high-ranking politicians advise them to get rid of the Venezuelan tenants. 'They told us that there couldn't be Venezuelans in the neighbourhood because that was detrimental to the legalisation process of our

settlement’ – said Elizabeth. This shows how xenophobia in Colombia is promoted by exclusive policies and the lack of instruments to help migrants. Until June 2021, the government issued the Temporary Statute for the Protection of Migrants (ETPM), which enforces the rights and duties of the Venezuelan people. This policy enables low-income migrants to access a free valid identification card that allows them to access formal work and a legal housing contract.

Unfortunately, legalisation will not improve all the living conditions of these families. They will have the opportunity to access credits, improve their houses and even sell their properties over time, while the flooding issue will probably increase with overpopulation. As Flavio de Souza states, ‘perceptions of land tenure security are different from perceptions of house tenure security’ (Souza, 2001). Therefore, consolidation of informal contexts should not depend on legal issues, especially when these are based on private ownership and individualistic policies that create endless loops of segregation.

## 5.4 – Fieldwork

As part of the qualitative research, interaction with the community is paramount during the analysis and design process. Participation during the analysis helps to understand the needs and desires of the inhabitants to define the main urgencies and opportunities at the local level. Participation also helps to verify the conclusions obtained from the spatial analysis of the different layers and set the social and biophysical values that would guide the design principles of the proposal.

This fieldwork aimed to examine some of the questions that have emerged in the first part of this investigation. The interaction with different actors involved in the development of El Rodeo can help the designer to grasp the diversity of perspectives, which are usually influenced by the role of individuals in society. For instance, the point of view of the urban planners working in the mayor’s office might be quite different from the intentions and aspirations of community members. For this reason, it is essential to determine multiple arenas to address different types of questions and using particular methods to approach each of these groups and individuals.

Due to time limitations (1 week), the fieldwork focused on exploring the area of El Rodeo and identifying the main features of Cucuta and the region. Four types of activities took place: 1) Meetings with stakeholders; 2) Community interviews; 3) Workshops with local actors; 4) Site visits to El Rodeo and other critical areas of Cucuta. Both interviews and workshops were planned as a base and not as an imposed method to implement. From previous experiences in participation processes, it is better to propose a flexible approach that is open to last-minute modifications instead of rigid models that would produce inaccurate conclusions.

1) Meetings with stakeholders. ‘Semi-structured interviews’ (Hernandez-Garcia & Yunda, 2018) with people from the AMC and the CMD, aiming to understand the main challenges in Cucuta and the urgencies and opportunities in El Rodeo.



2) Community Interviews. These were also semi-structured interviews to understand the diversity of El Rodeo, its historical background and current conditions.

3) Workshops. Two workshops took place during the visit, one with local leaders from the community action boards (JAC) and the other with children from El Rodeo. The idea of the workshops was to identify the needs and desires of the inhabitants and the opportunities and threats of the territory.

4) Site Visits. The first objective was getting to know how people live on the border with Venezuela, learn from its cultural diversity, understand the landscape's complexity, and grasp the first ideas of what El Rodeo is. For more information about the methods used in the workshops, please check the appendix.



FIG. 5.18 Workshop developed with kids and youngsters from El Rodeo. Source: photo taken by the author.

FIG. 5.19 Workshop with local leaders from El Rodeo. Photo: Catalina Rodriguez.

## 5.5 – Reflections with the community

During the interviews and workshops held in El Rodeo, four main topics were discussed: housing and legalisation, community, employment, environment and risk. Each topic includes takeaways and reflections.

### Housing

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Some of the inhabitants rent a house to pirate developers and others are 'owners' of the houses. The first moved to El Rodeo looking for a cheap rent and the second had no means to pay rent and decided to take over the land. Many of the residents have been scammed by false landlords, offering them property rights of the land. In addition, the community feels little confidence on public institutions and not everyone is interested in legalisation. Some of them believe that this will only increase the costs of public services and taxes, while others think this would raise the value of their homes. Regardless to the risk of flooding or landslides, the participants said that the communities in El Rodeo are interested in the consolidation of their neighbourhoods but they perceive little commitment of the public institutions, contrary to the participation of civic institutions.

### Community

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There is a need of social integration of communities. Understanding community in two different ways, one related to location and the other to their place of origin. On the one hand, each of the settlements has created a strong identity between neighbours, helping each other in the construction of their homes day by day. However, decision-making between settlements is difficult to coordinate. On the other hand, there is a strong discrimination towards the Venezuelan community. According to the interviewees, the insecurity in Cucuta has increased after the Venezuelan crisis. They argue that some of the illegal migrants are not afraid of committing crimes as they have no rights but also no responsibilities as civilians. Due to their irregular status, Venezuelans are also considered as cheap labour,

affecting the job opportunities of low-skilled workers. Hopefully the new Act for the protection of migrants can help to change this. It is important to mention that most of the families in El Rodeo are composed by single mothers with their children. Some families come from the Catatumbo region, others are Venezuelans or returned Colombians who had been living across the border for many years.

Another issue that is always mentioned during conversations is the micro-trafficking of drugs. The community knows where are the spots where the dealers sell drugs. However, people are afraid of talking about the topic because they could receive threats. The most affected are young generations, who receive free doses to get engaged with drugs. To this respect, neighbours think that El Rodeo needs more facilities, where kids and youngsters can get involved in different kinds of activities and encourage them to continue with professional education.

### Employment

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Most of the participants depend on informal jobs related to the construction sector and commerce. Before closing the border, some families were living from gas smuggling from Venezuela. During Covid-19 there was a raise in unemployment rate. In fact, according to the DANE, Cucuta has the largest unemployment rate in Colombia with 22.3 per cent (DANE, 2021). Some of the participants stated to receive financial aid from family and friends living in other cities like Bogota since the beginning of the pandemic. In general, people perceive a lack of productive means inside the neighbourhood. As a possible solution, Rafael, resident of Valles del Giron, thinks that the municipality should engage the community in the construction of public works, such as the embankment of creeks with gabion baskets. As a result, this would create jobs and strengthen the identity between neighbours.

### Environment and risk

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During the workshops and interviews, the attendees showed concern about water pollution and flood risk. As depicted in the drawings, 'El Caño' or the Creek is highly contaminated, affecting residents and wild species. They believe that completing the sewage system, reducing overflows of water on the creeks and reducing pollution will eradicate the problem of flooding.

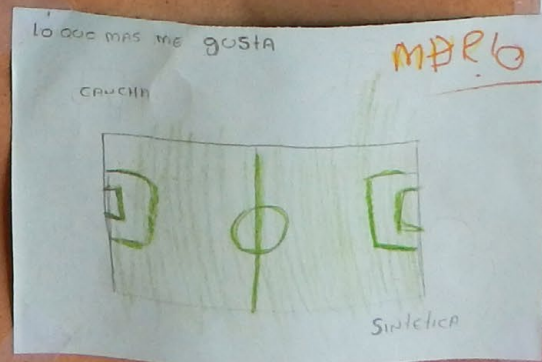
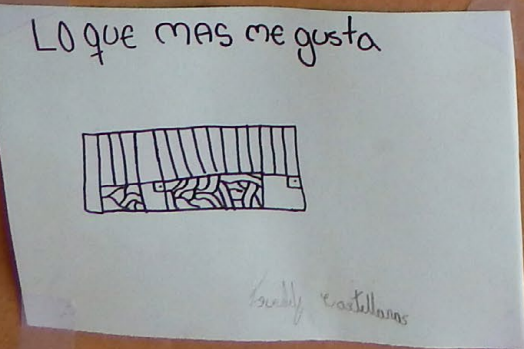
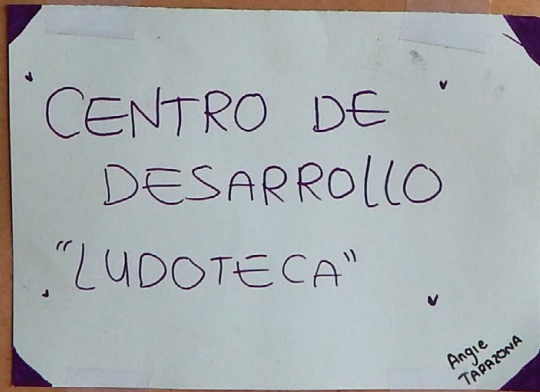
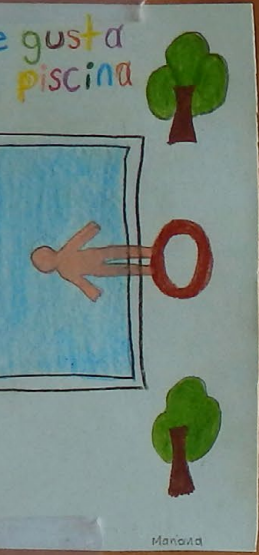
At the end of the workshop, after drawing the urgencies and opportunities of their settlements, the participants said the exercise helped them to raise awareness about working collectively, would help them achieve better results. Also, working in cooperation with civic organizations can help them fix their problems and be heard by the public institutions.

FIG. 5.20 (Next pages) Drawings developed by kids and youngsters during the workshop. 'Lo que mas me gusta' What I like the most / 'Lo que no me gusta' What I dislike about my neighbourhood. Photo taken by the author.

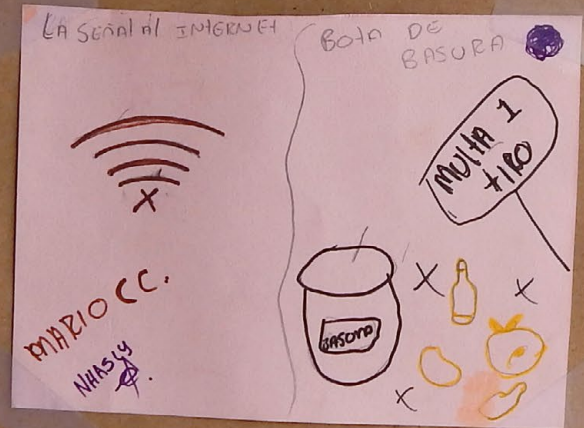
**'The community is willing to collaborate in whatever way, but since the projects are developed at the national level nothing happens.'**

*Rafael. Inhabitant of Valles de Giron, El Rodeo (2020).*

# LO QUE MÁS ME GUSTA



# LO QUE NO ME GUSTA





## 6 – Case Studies: Other border cities

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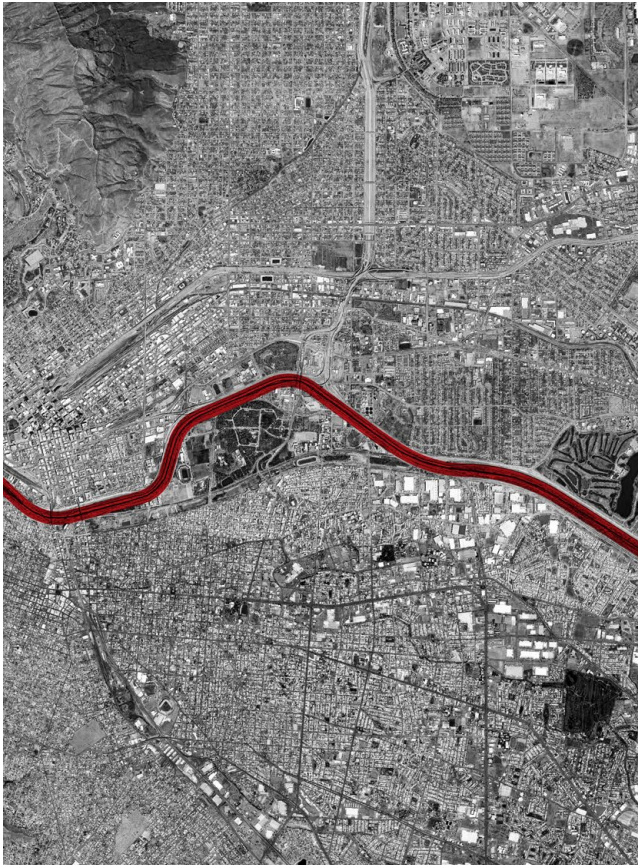
What can we learn from other border cities in similar conditions to Cucuta?

FIG. 6.1 (Previous page) U.S.-Mexico Border close to Ciudad Juarez. Image retrieved from the video: Why a Designer Turned the U.S.-Mexico Border Into an Art Installation | The New Yorker.

FIG. 6.2 (Left) Border between the United States and Mexico. El Paso, Texas on the north and Ciudad Juarez, Chihuahua on the south. (Right) Border between Paraguay and Brazil. Ciudad del Este on the west and Foz do Iguacu on the east. Both maps have the same scale. Source: Google Earth and modified by the author.

The aim of this chapter is to put Cucuta in context with other border cities based on the concepts of borders and edges. On the one hand, the case of Ciudad Juarez (Mexico) and El Paso (United States), a critical example between the so called Global North and Global South. On the other hand, the case of Paraguay, a country of border cities. In the first example we will focus on Ciudad Juarez and in the second on Ciudad del Este, otherwise this exercise would involve five cities in two national borders. Three topics will be discussed: the permeability of the border over time and its implications in the urban growth of the city; the relationship between edges and the key issues of this research, risk, accessibility, centralities and housing; a basic understanding of the planning framework in relation to informal settlements.

**El Paso (US) - Ciudad Juarez (MX)**



**Ciudad del Este (PY) - Foz do Iguacu (BR)**

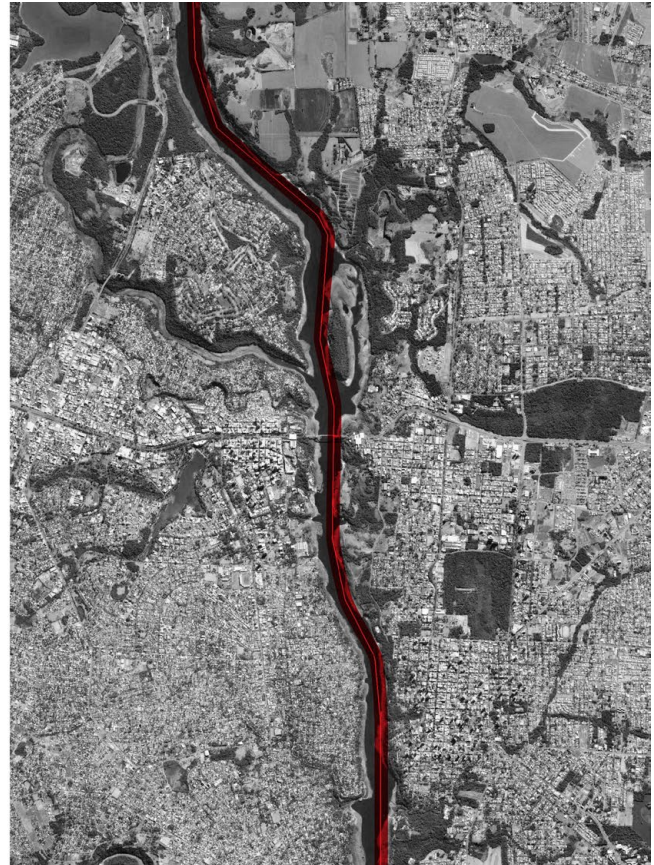




FIG. 6.3 (Above) Art installation by Ronald Rael in the U.S.-Mexico border. Source: Why a Designer Turned the U.S.-Mexico Border Into an Art Installation | The New Yorker.



FIG. 6.4 (Right) View of El Paso, U.S. from Ciudad Juarez, Mexico. Source: the guardian. Lorena Ros/ Getty Images.

## 6.1 – Ciudad Juarez

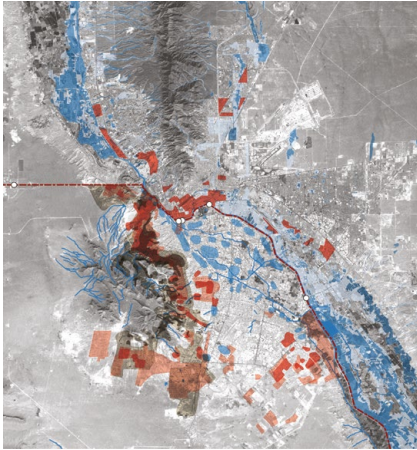
Ciudad Juarez is the sixth largest city in Mexico, and the second largest border city after Tijuana. Its development began with the construction of the international bridge of 'El Paso' in 1885, and the area was declared as free trade zone. Three decades later, the Mexican revolution produced a large diaspora to the United States (US) to avoid violence. However, during the next years, the Prohibition of alcohol in the US brought a commercial boom in parallel to a rise of organized crime, prostitution and gambling.

During the second half of the XX century, 'maquiladoras' originated in Mexico to manufacture foreign goods with advantage of low-cost labour (Britannica, 2001), attracting people from rural areas to work in cities. But it was until 1994, with the NAFTA agreement that the industry flourished and the city had an exponential growth, showing a 'rapid expansion and dispersed trend' (Juarez Municipality, 2016), especially towards the southeast.

Despite of the industrial boom, during the last decades the city has had a major growth in commerce over industry. In 2019 commerce and services represented 50% of the economy, while industry lowered to 47.5%. In addition, Ciudad Juarez has one of the second lowest rate of informality in the country (14.5%), due to its industrial performance (INEGI, 2019). In 2021, the closing of the border led to a rise of informal economy but boosted local consumption and sales turned towards the interior of the country.

### Risk.

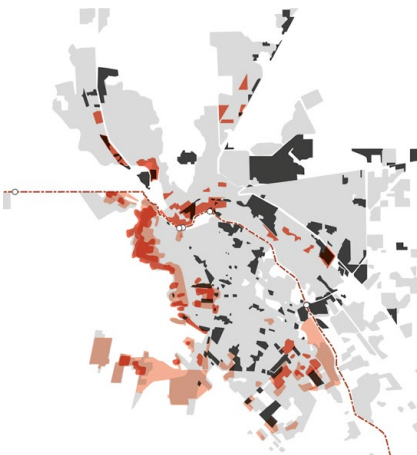
The Maquiladora industry provides great part of the jobs in Ciudad Juarez but is based on low wages, which means a low capacity of workers to purchase formal housing. As a consequence, this brings more informal occupation in the peripheries



Environmental risks



Railway network



Maquiladora Industries

and on many occasions in areas of high environmental risk' (Ayuntamiento Juárez, 2016). This means on the foothills of the mountains and in areas prone to flood risk.

In the meantime, on the other side of the border, the highest poverty rates appear close to the border. This area is also affected by flooding and the proximity to the industries. In general, all this region is affected by the North American Monsoon (Flash floods in late summer). In these areas close to the river, house insurances are higher, which also has repercussions in mortgages to purchase housing. All this area, is where most of the Hispanic communities live, creating ethnic and spatial segregation. According to the US national statistics, 82.9% of inhabitants of El Paso declare themselves as Hispanic. However, they live in better conditions than Mexicans of Ciudad Juárez do.

### Accessibility

The Maquiladora industries define part of the city's structure. In the past they were located close to the railway stations that used to connect them to the border. Nowadays they are spread across the city in monofunctional areas or 'industrial parks'. Still, the train is used only for the transportation of goods from the interior of the country towards the border. The Transportation Master Plan is the only transboundary plan in the region, which regulates the infrastructure that enables trading across the border. Even so, it does not include strategies to improve the living conditions of vulnerable communities.

### Centralities

Since 2010, the municipality of Ciudad Juárez attempts to move towards a polycentric structure of development. In 2016, new master plans were developed for the urban expansion of maquiladora industries. However, some of these areas were already occupied by informal settlements. Despite of having work (industries) close to housing, these expansion areas still lack facilities and services. At the same time, the use of poor materials for construction and the occupation of high-risk areas undermines the development of these areas. Therefore the urban growth of Ciudad Juárez during the last decades 'can be described as dispersed and with inefficient land use' (Mendoza & Sanchez, 2009). Moreover, the city has an issue of abandoned dwellings that started during the last two decades. This occurs in monofunctional areas of the peripheries and is caused by the 'insecurity of drug-trafficking and the economic crisis. This phenomenon has strong implications on the consolidation of gated communities' (Ayuntamiento Juárez, 2016).

The planning instruments in Ciudad Juárez apply the design principles from the National and regional level to the scale of the municipality, known as PDUS. The last plan of 2016 includes strategies by topic for the entire city and specific actions for each of its local centralities. However, planning is not decentralized through individual local plans by district.

FIG. 6.5 Maps showing the layers of landscape, infrastructure and occupation, overlapped with vulnerable housing (red). Maps developed by the author.





FIG. 6.6 Friendship International Bridge between Ciudad del Este (left) and Foz do Iguazu (right). Source: <http://urban-networks.blogspot.com/2017/02/ciudades-triples-en-las-fronteras-los.html>

FIG. 6.7 Population of Paraguay by district, between 1962 and 2002. Source: UN (2017) Diagnostico para el ordenamiento territorial de Paraguay. DGEEC.



## 6.2 – Paraguay: A country of border cities

Until the 1950s, Paraguay had an economic dependency on Argentina to export goods through the Parana River. Due to high taxes, Paraguay started developing towards the east, seeking a second exit to the Atlantic Ocean through Brazil and developing Ciudad del Este as the second border city of the country. But it was until 1965 that the town started growing after the completion of the International Friendship Bridge ‘Puente de la Amistad’. This area is called the ‘Triple boundary’ between Ciudad del Este (PY), Foz do Iguazu (BR) and Puerto Iguazu (AR), with a population of over one million, being Ciudad del Este the largest town. The permeability of this border is quite open, with constant flows of goods and people, even during the pandemic.

The economy of Paraguay is based on the exportation of meat, soy and other products, especially to other countries in South America. Industries are closely related to the primary sector and located close to the border cities of Asuncion and Ciudad del Este, also the major cities in the country. In Ciudad del Este, the river also becomes an asset for tourism because of the Iguazu Falls and an energy source. The Itaipu Dam between Paraguay and Brazil is the second-largest hydroelectric station in the world.

Despite not having a direct exit to the ocean, Asuncion and Ciudad del Este become mediators between the agriculture produced in the hinterlands of the continent and the international sphere. Hence, the rivers as borders represent a connection to the world and a source of energy for Paraguay. However, it also creates environmental risk as informal settlements are located in flooding areas at the riverbanks<sup>1</sup>. Therefore, the concept of edges applies at different scales. On the national level, it refers to the rural areas in the interior of the country, while on the urban level, it relates to the areas with poor living conditions.

On a large scale, accessibility is one of the critical issues. Since 1990, the railroad connecting to Argentina was cancelled, while only 7.5% of the national roads are paved (UN, 2017). This also creates a tension of urban development between the two border cities where commerce and industry are concentrated. On the lower scale of Ciudad del Este, this tension prevails, as the airport and industries are located to the west, and the international bridge is on the east. As a result, the model of urban growth in both cities follows a suburban pattern towards the interior of the country, which is ‘unplanned, dispersed, fragmented and unsustainable’ (BID, 2014).

Regarding spatial planning, decisions are mostly taken at the national level, and the administration is centralized in Asuncion. Both cities have a development plan, but the lack of data related to cadastre and informality becomes a limitation for planning at the local level. In 2016 Ciudad del Este released a development plan with a vision and design principles that are not visible in concrete actions. In fact, one of the objectives of this document is to formulate a structural plan for the region.

<sup>1</sup> This issue happens in both Ciudad del Este and Asuncion.

Aspects	Ciudad Juarez (MX)	Ciudad del Este (PY)	Cucuta (CO)
Population	1,512,450	306,679	777,106
Permeability of the border before Covid-19*	High restrictions	Low restrictions	Medium restrictions
Direction of urban expansion	Away from the border	Away from the border	Towards the border
Socio-economic asymmetry across the border	High	Low	High
Industry	47.5%	No data**	15%
Informal jobs	14.5%	No data***	72%
Informality related to environmental risks	Yes	Yes	Yes
Planning instruments	Urban level	National level	Metropolitan level
Transboundary Planning	No	No	No

FIG. 6.8 Summary table of the aspects related to the border and edges in the three cities. Developed by the author with multiple sources.

\* The Permeability of the border is considered regarding to its official crossings. The border between Mexico and the US is fenced while in the other two cases is determined by rivers.

\*\* As an approximation, the industrial sector in Asuncion is related to manufacturing (13.8%) and Construction (6.5%), very low in comparison to Ciudad Juarez (BID, 2014).

\*\*\* Paraguay has a rate of 51% of informal jobs in its urban areas (BID, 2014).

### 6.3 – Learnings for Cucuta

Throughout the history of Ciudad Juarez, the border has brought opportunities for the development of new industries, reducing the dependency on transboundary commerce and the rate of informality. Having a solid industry also allows the city to adapt to border fluctuations, as occurred during the Covid-19 crisis when Ciudad Juarez turned its production towards Mexico. On the contrary, the weakness of the industrial sector in Ciudad del Este and Cucuta has implications in the informal economy.

In addition, the permeability of the border goes beyond the spatial limits of countries, affecting the status of migrants in the arrival cities. For instance, the maquiladora industries in Ciudad Juarez have the way open to transport goods across the border through the railway network, while the anti-migratory policies of the US restraint the movement of people. This also happens in Colombia, where a high number of irregular migrants cannot access the same benefits as locals do. One reason for this to happen is the socio-economic asymmetry between neighbour countries, as people are always looking for better living conditions. However, the restrictions in the US and the lack of instruments to embrace migrants in Colombia produce more informality.

Ciudad Juarez as Cucuta and Ciudad del Este have environmental risks, poor accessibility and lack of facilities and services in their peripheries. In the three contexts, it is urgent to decentralize the planning instruments. On the one hand, by creating local plans to transform visions into actions for the lower scale and on the other, moving towards transboundary planning to coordinate decisions that affect the cities of transition.

**BORDER**

**EDGES**

Ciudad Juarez (MX-US)



Ciudad del Este (PY-BR)



Cucuta (CO-VE)



FIG. 6.9 Satellite view of Borders and Edges in 3 border cities. All images have the same scale. Source: Google Earth.

PART 3

## Research-by-design

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Scenario exploration and key projects

**'Temporal landscapes interrogate the illusion of permanence in cities and legitimize the simultaneity of both permanent and impermanent urban configurations.'** *(Mehrotra & Vera, 2017)*



## What if Cucuta rethinks its edges as transitional territories in process of consolidation?

As explained in the analysis, Cucuta, like other second-tier cities in Colombia, is growing exponentially, and the city is unable to cope with all the issues that this implies. Furthermore, housing policies promote ways of development that families in vulnerable conditions cannot even afford. This way of thinking the city denies an existing reality and stigmatises the people who live illegally on the edges of Cucuta. As in the case of El Rodeo, some families have been living for over 20 years with insecurity in land tenure, environmental risk conditions, and the uncertainty of an unstable job without guarantees. Today with the Venezuelan crisis, this problem is more severe.

In a city where more than 72% of the population depends on an informal economy, one may think it is necessary to create alternative policies that promote safe and spontaneous growth. What if the expansion areas of the city, where informality is the primary trend of development, were considered transitional territories in consolidation? Rethinking these areas as interstices of opportunity between urban and rural, where vulnerable communities find ways to coexist in susceptible landscapes.

In response to the lack of visible actions in the Structural Plan of the city (POT), it is possible to use the scenario construction to envision possible futures for Cucuta and its edges. Using the What if questions as a guiding tool, this research-by-design chapter will explore four topics: coexist with risk, efficient accessibility, local centralities, housing and place-making. Each of these topics tries to synthesise the central issues using as a base the four urban networks: Landscape, infrastructure, occupation and governance (adaptation of the layer approach used in the EMU programme: Wandl, Rooij, Rocco, 2012; Meyer, 2019).

Each topic starts from the conclusions of the analyses done for the metropolitan area in chapter 4 and poses a What-if question. Maps and images are used in this part to show the current situation on a large scale. Then, we will look at reference projects and finally propose a set of strategies for El Rodeo.

The goal of this framework is to plan from the local level to respond to large scale issues. As explained before, one of the main issues of the POT is the lack of local plans and concrete actions. Therefore, this research-by-design has a structure that includes different scales. As a result, the planning office of Cucuta could use this structure to integrate the POT with local plans for each of its districts. If this planning model is successful in El Rodeo, it is possible to replicate it in other parts of the city.

The diagram on the next page illustrates the structure of the following chapters.

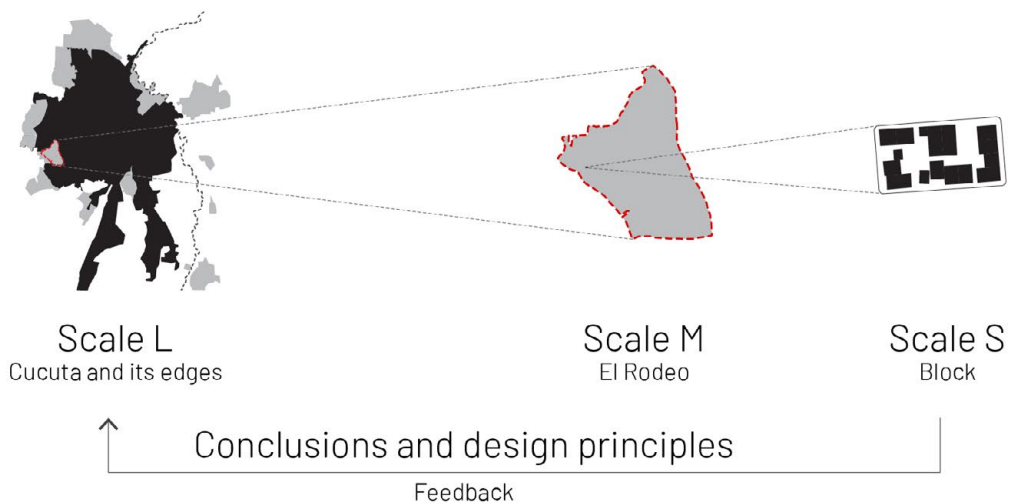
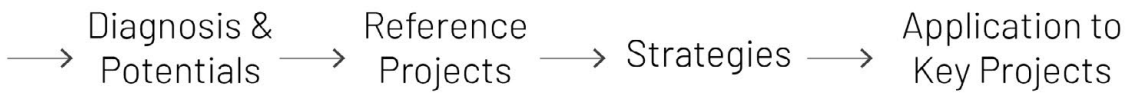
FIG. 7.1 (Previous page) Neighbourhood on the edges of Cucuta. Photo taken by the author.

## Scenario exploration

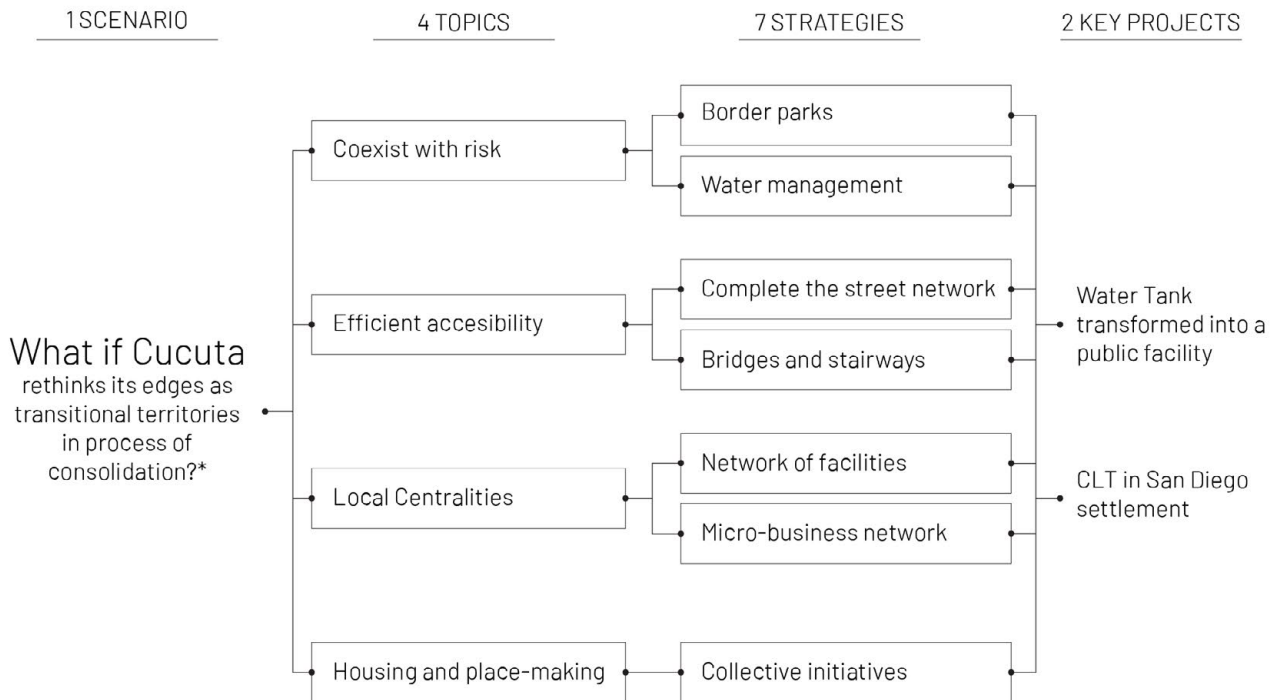
Previous analysis  
of the POT



What-if?  
Sub-questions  
by topic



This scenario exploration could inform the construction of a local planning framework for Cucuta and its edges.



\* Rethinking the fringe areas of the city as interstices of opportunity between urban and rural, where vulnerable communities find ways to coexist in susceptible landscapes.





# 7 – What if Cucuta manages to coexist with risk?

## 7.1 – Diagnosis and description of the scenario

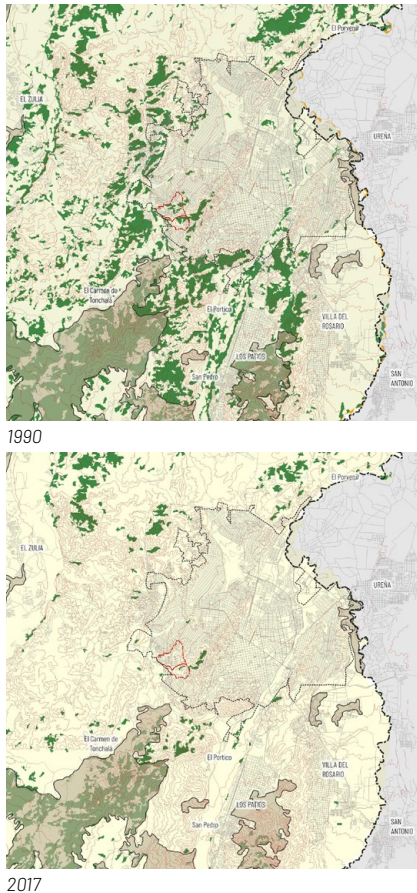


FIG. 7.2 (Above) Map of the forests (green) in the region of Cucuta during 1990 and 2017 (Bellow). In light ochre, the area is classified as a tropical dry forest, an indigenous biome at risk of devastation. In red, the area of El Rodeo. Source: IDEAM.

FIG. 7.3 (Previous page) Houses in El Rodeo affected by the flooding of November 2020. Source: CMD. Modified by the author.

After the Iota storm during November 2020, the environmental risk is the most dramatic and visible challenge in Cucuta today. Many families lost their homes, some others disappeared or even died because of the strong rainfalls that produced the flooding of rivers and creeks. This event put in evidence that both, formal and informal settlements are located in high-risk areas. Now the mayor and the national government are investing efforts in canalizing rivers and relocating the most affected families, which creates more dependency on infrastructure. Unfortunately, there are still no strategies designed to prevent people from building their homes in high-risk areas and the flooding incident will probably be forgotten over time.

But what if there is a second earthquake or another flooding?<sup>1</sup> Undoubtedly, the city is not prepared for neither of the two cases. Developing this scenario, will help us to understand the relationship between the occupation and landscape layers over time, create awareness to local actors about the current patterns of growth and imagine where should the city build or restore space for nature in the coming years.

The maps of forests between 1990 and 2017 show how the forest has been affected by agriculture, mining and all human processes that take place in the region of Norte de Santander. Occupation not only implies the construction of the urban fabric, but all the activities that modify the environment. If we do nothing the risks will increase and the possibility of ensuring ecosystem services for future generations will drop down.

This scenario envisions a city in which citizens can live in safe conditions without worrying of natural disasters. An environment where nature is conceived as an opportunity and not as a threat or the place where our waste goes. If it is impossible to avoid risk because of the location of the city, at least it can be possible to imagine strategies to reduce the pressure of the human processes on the landscape and understand the conditions of the territory to guide the city's development.

To make this happen, it is necessary to create the right arenas in a close dialogue with major stakeholders and community actors (Albrechts, 2001). The planning office of the AMC has to work hand in hand with the private sector, including the major industries of the region and other public institutions such as CORPONOR which is in charge of the environmental resources of the region. In the same way, it is important to engage citizens and create programs to inform but also to create awareness of strategic issues.

<sup>1</sup> The earthquake of 1875 almost destroyed the entire city. By that time Cucuta had barely 12,000 inhabitants.

## How to make this scenario possible?

As explained in chapter four, there is a correlation between high-risk areas and low-income communities. The first map of diagnosis and potentials (Fig. 7.4) shows how these settlements could be transformed into parks, improving the city's ecological connectivity. The POT already raised this idea: 'Implementation of strategic plans for the recovery and consolidation of linear parks and ecological parks on the city's edge' (POT, 2019: 3.1). However, this would mean an eviction project at an outrageous cost that Cucuta is unable to afford. In the same way, another much more viable possibility is recovering the landscape of the old mines in disuse.

What else can be done if the government cannot relocate everybody? If it is not possible to avoid every risk, we must find ways to coexist with it.

The second map also illustrates risk, but this time to a lower extent. In areas classified as medium and low risk, it is feasible to legalize the existing settlements and implement policies to avoid the densification of the remaining open spaces. Instead, the municipality could define these interstices as parks and temporary facilities to allocate low impact activities during dry seasons and areas for slow water infiltration during rainy seasons.

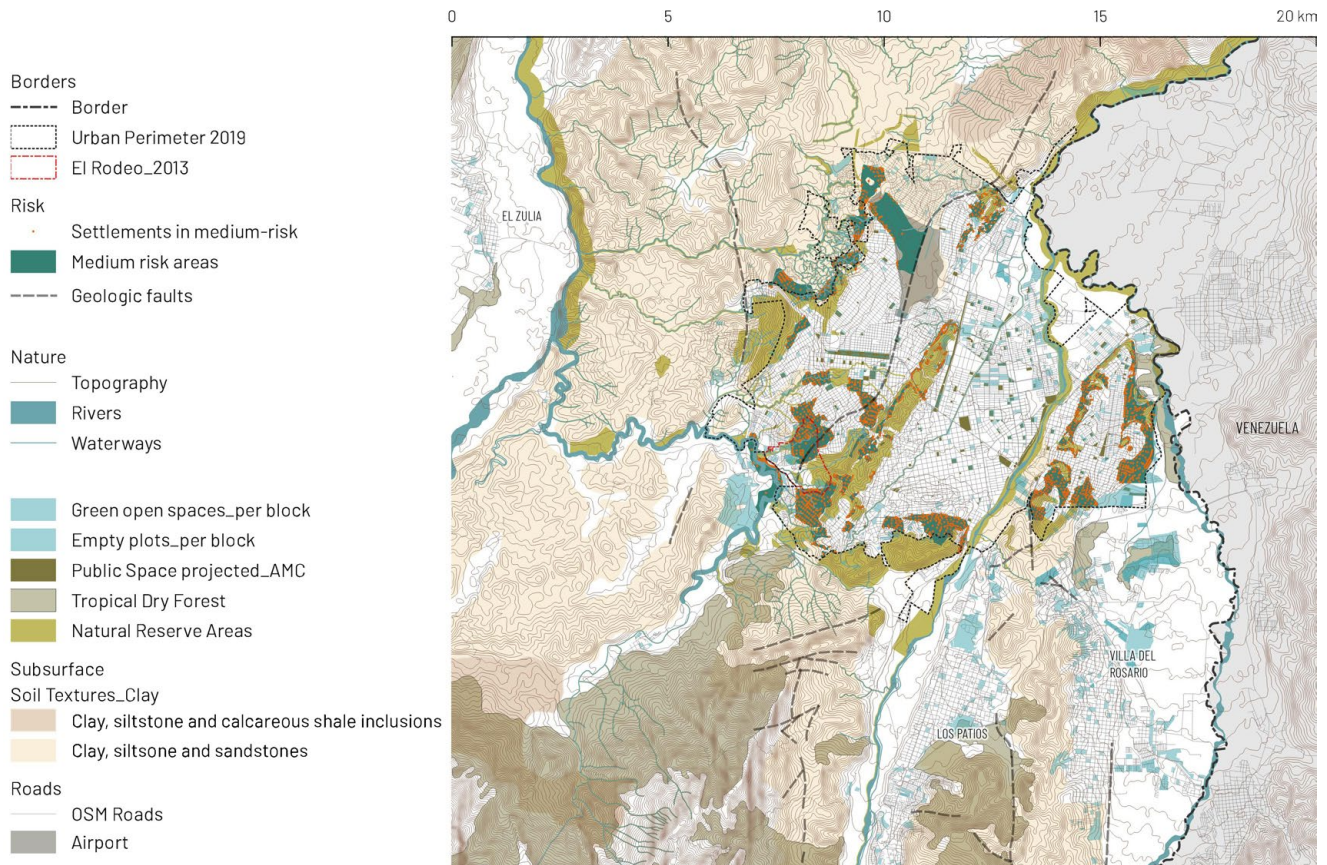
FIG. 7.4 Ecological restoration and connectivity. Map developed by the author. Source layers: POT Cucuta, IGAC, DANE, OSM.



In addition, the city could introduce different strategies to store water, such as upstream reservoirs and distributed supply systems that would benefit the water supply chain, especially during dry seasons. One week after the flooding of November 2020, there were unexpected water outages for several days. Currently, the aqueduct company is enlarging the tanks and pipelines, but there is still much to do. On a smaller scale, it is possible to collect rainwater that falls on buildings and store it close to the users, also known as distributed supply systems. This strategy is a cheap investment that can help to reduce the 'cost of centralized water storage and transportation' (Klemes et al., 2009) while diminishing water run-offs and overloads on the drainage system.

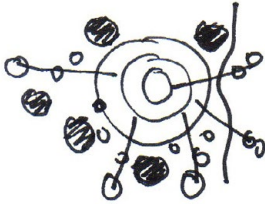
FIG. 7.5 Taking into consideration the hydrologic properties of the subsurface it is possible to implement SUDs in Cucuta. Doing an assessment of soil moisture and permeability conditions, would help to estimate the water runoff, flood and drought potential of green open spaces (Based on NRCS dataset in Zeng et al., 2017). Map developed by the author. Source layers: POT Cucuta, IGAC, DANE, OSM.

In terms of wastewater, most of the city is covered by the sewerage system. However, all sewage discharges go to rivers and creeks, as Cucuta does not have wastewater treatment plants, affecting the most vulnerable communities. The municipality expects to build four treatment plants to clean part of the wastewater discharges in the near future. For this reason, it is necessary to connect all the housing units to the system.

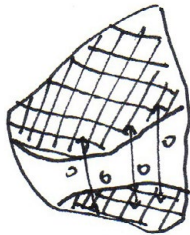


## Where to urbanize without risk? (Suitability analysis)

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Smart infill



Consolidate the existing and open space where necessary

Using interstices wisely is a proposal for the POT to guide the evolution of urban growth outside of dangerous areas. In terms of occupation, in a city where 73% of the population lives in individual houses (DANE CNPV 2018), little extra space is needed to expand the city. The development can focus on re-densification and infill occupation of existing urban areas. However, it is also a fact that most people who depend on the informal economy need different dynamics from the spatial conditions offered by condominiums or do not have the means to access 'priority housing'. As a result, they end up living on the edge of the city. Solving the housing issue goes beyond land regulations to prevent informal occupation. It needs a profound transformation in planning and social values.

Following the idea of the project for Grand Paris by the team of Bernardo Secchi and Paola Viganò (2011), we can adopt the classification criteria to determine which areas are suitable for new urbanization. This method is also inspired by Ian McHarg (1969) in 'Design with Nature', giving a scale factor to evaluate the potential of the territory to allocate a particular activity. Therefore, a suitability analysis is a qualitative method of organizing quantitative data. In this case, based on the inventory maps of Cucuta's POT, IGAC (Agustin Codazzi Geographic Institute) and the department of national statistics DANE. Nevertheless, this exercise is most useful to inform the planning on a larger scale. For the small scale, it is better to verify the information by doing an assessment of qualities and potentials, to understand which processes (activities) are compatible with the soil conditions.

This exercise has some limitations. First, most of the data correspond to the municipality of Cucuta, so the white areas (opportunities) might be inaccurate for the regions outside Cucuta's perimeter. Secondly, there is always the possibility of interpreting the values differently. For instance, the airport could be classified as an opportunity for new development if the municipality decides to relocate it out of the city. Moreover, empty plots could also be transformed into parks.

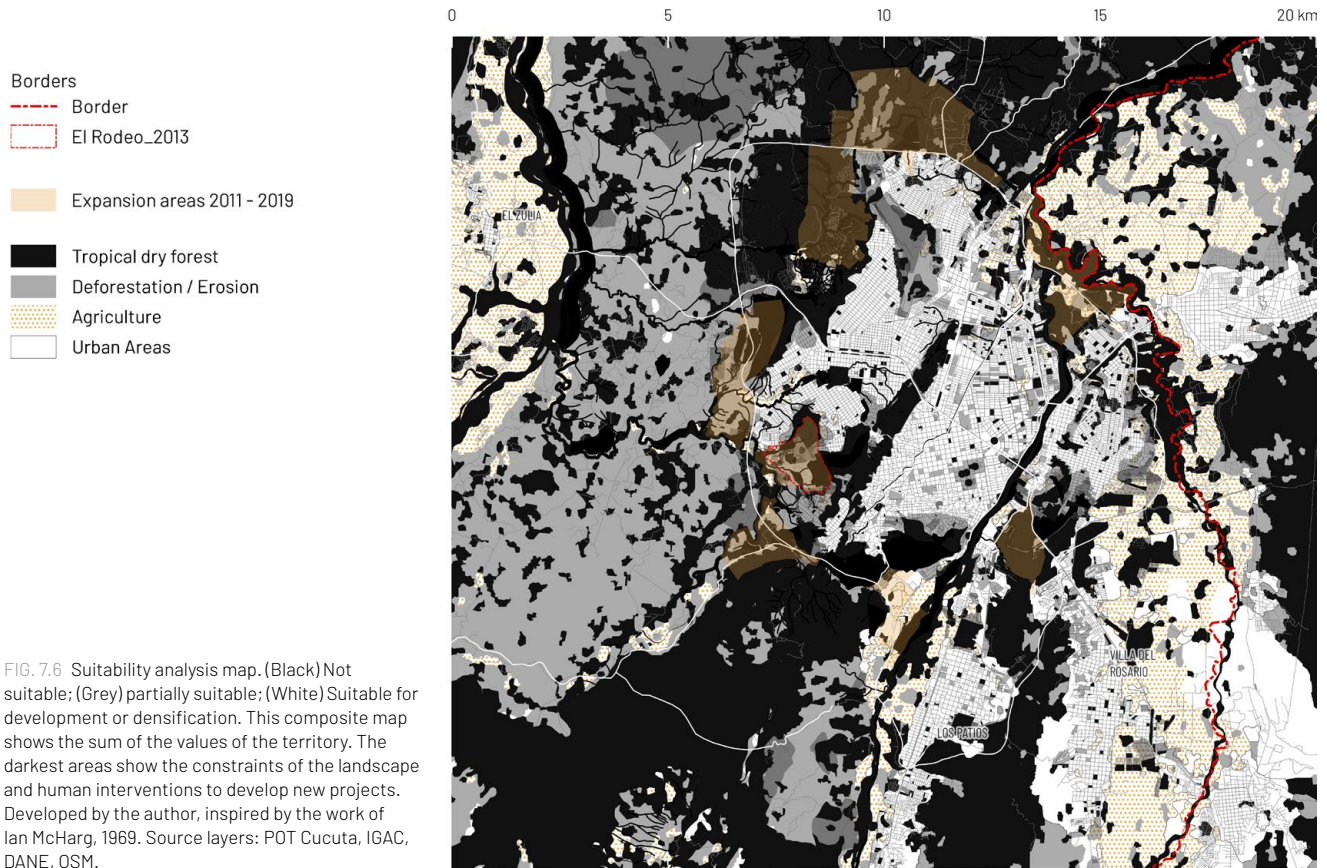


FIG. 7.6 Suitability analysis map. (Black) Not suitable; (Grey) partially suitable; (White) Suitable for development or densification. This composite map shows the sum of the values of the territory. The darkest areas show the constraints of the landscape and human interventions to develop new projects. Developed by the author, inspired by the work of Ian McHarg, 1969. Source layers: POT Cucuta, IGAC, DANE, OSM.

## 7.2 – Reference projects



FIG. 7.7 Room for the River Waal in Nijmegen, The Netherlands (2012-2016). Source: <https://climate-adapt.eea.europa.eu/>

Looking for reference projects related to risk management and biophysical connectivity, we can find countless examples that vary according to scale. There are interesting examples in the Netherlands on a large scale, such as the Room for the River Waal in Nijmegen. The city adapted the river's shores by digging a parallel channel that works as a buffer zone during high tides, creating a new park for recreational activities and giving more space to other species. However, the cost of this kind of project is much higher than the budget of the municipality of Cucuta and may not be adequate for the topographic conditions of the elevated areas of the city. Therefore, it is also necessary to look at other types of smaller-scale and lower-cost projects to reduce the amount of water that runs down the hills.

FIG. 7.8 (Below) Nærheden, Suburb Of The Future, Master Plan. Copenhagen, Denmark. Karres+Brands Architects (2016-2035).

FIG. 7.9 (Right) Image of the interior of the blocks at Nærheden. Source: <http://landezine.com/index.php/2016/12/naerheden-suburb-of-the-future/> (Retrieved the 28-04-2020)

The master plan for Nærheden in Copenhagen is also a large-scale intervention that combines land-scape urbanism with a new housing development. Even if the context is quite different from the one in El Rodeo, it is possible to learn some of the design principles used for this project. The water system of the master plan has a more robust hierarchy than the street network, connecting all the parks to the interior of the blocks with different stages for water infiltration. The public space has a dense network of bicycles and walking paths that contribute to the social integration of the community in close relationship to nature.

In El Rodeo and other expansion areas of the city where the limit between urban and rural is still blurred, the municipality could formulate local plans to transform vacant lots into green open spaces to improve the green-blue network. Larger plots can become border parks to reduce the informal occupation of high-risk areas. In comparison, smaller parcels can have the potential to become used as urban gardens and other communal activities. Identifying these areas from the local level can help achieve small projects with a high impact at a low cost. For this, it is essential to involve citizens in the transformation of their own environments.



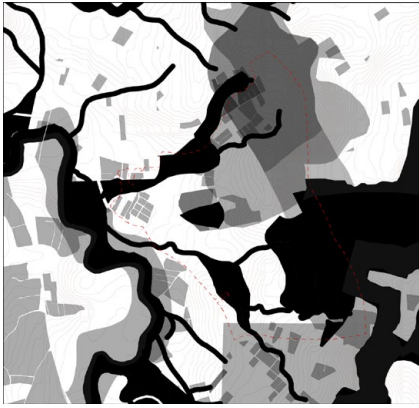
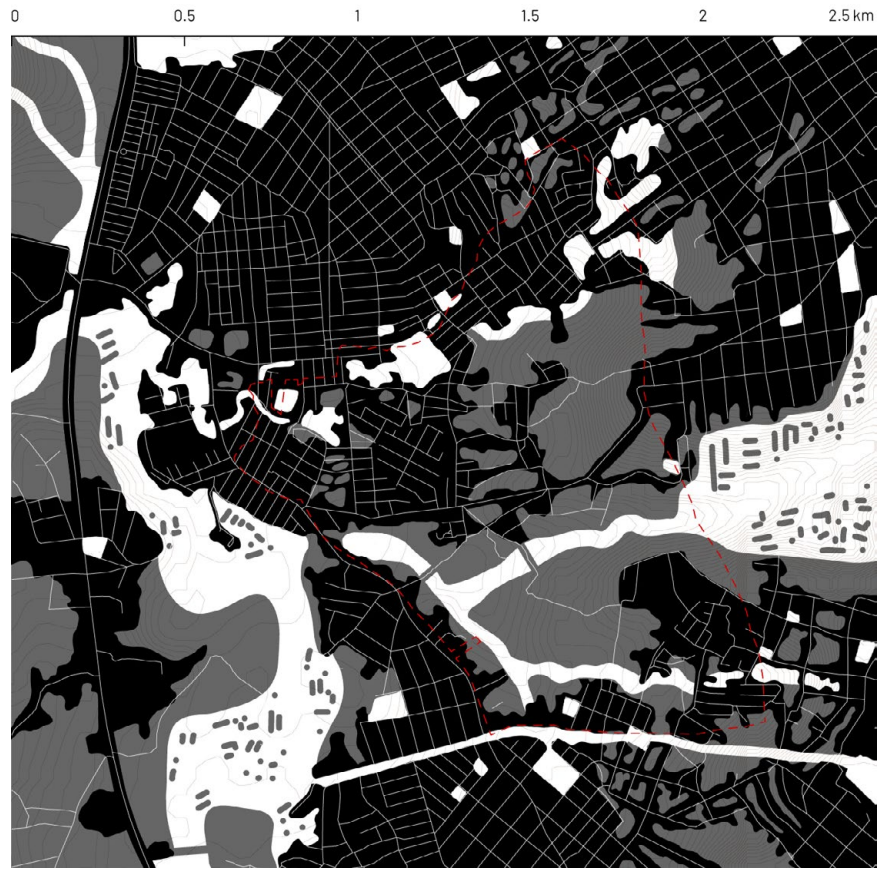


FIG. 7.10 Zoom in of the suitability analysis map to the area of El Rodeo. Developed by the author. Source layers: POT Cucuta, IGAC, DANE, OSM.

FIG. 7.11 Map showing the occupation of El Rodeo in 2020 (black). Developed by the author. Source layers: Google earth, OSM, DEM, USGS.

FIG. 7.12 (Right) SCENARIO CHAOS. What if we do nothing by 2030 in El Rodeo? In black the occupation by 2020 and in grey all the suitable areas for development, excluding water bodies, steep slopes, electric infrastructure and local parks / pitches. Developed by the author. Source layers: Google Earth, OSM, DEM, USGS.



### Scenario Chaos. What if we do nothing by 2030?

The suitability analysis done for Cucuta is a qualitative method used to organize quantitative data. It is primarily helpful to inform the planning at a large scale. Still, it can become inaccurate for the smaller scale (See map on the left), especially if the area of study is developed spontaneously by its inhabitants, as is the case of El Rodeo. Therefore, the scenario chaos is an extrapolation of the urban fabric in El Rodeo by 2030 if the city keeps growing as in 2020. This scenario helps illustrate the municipality's short capacity to mitigate the occupation of high-risk areas, plan from the local level, and work in cooperation with local communities.

### 7.3 - Landscape Strategies for El Rodeo

The next part explains two landscape strategies applied to El Rodeo. The first one involves creating border parks to improve ecological connectivity and reduce the informal occupation of high-risk areas. At the same time, the second strategy envisions a new governance based on watershed systems.



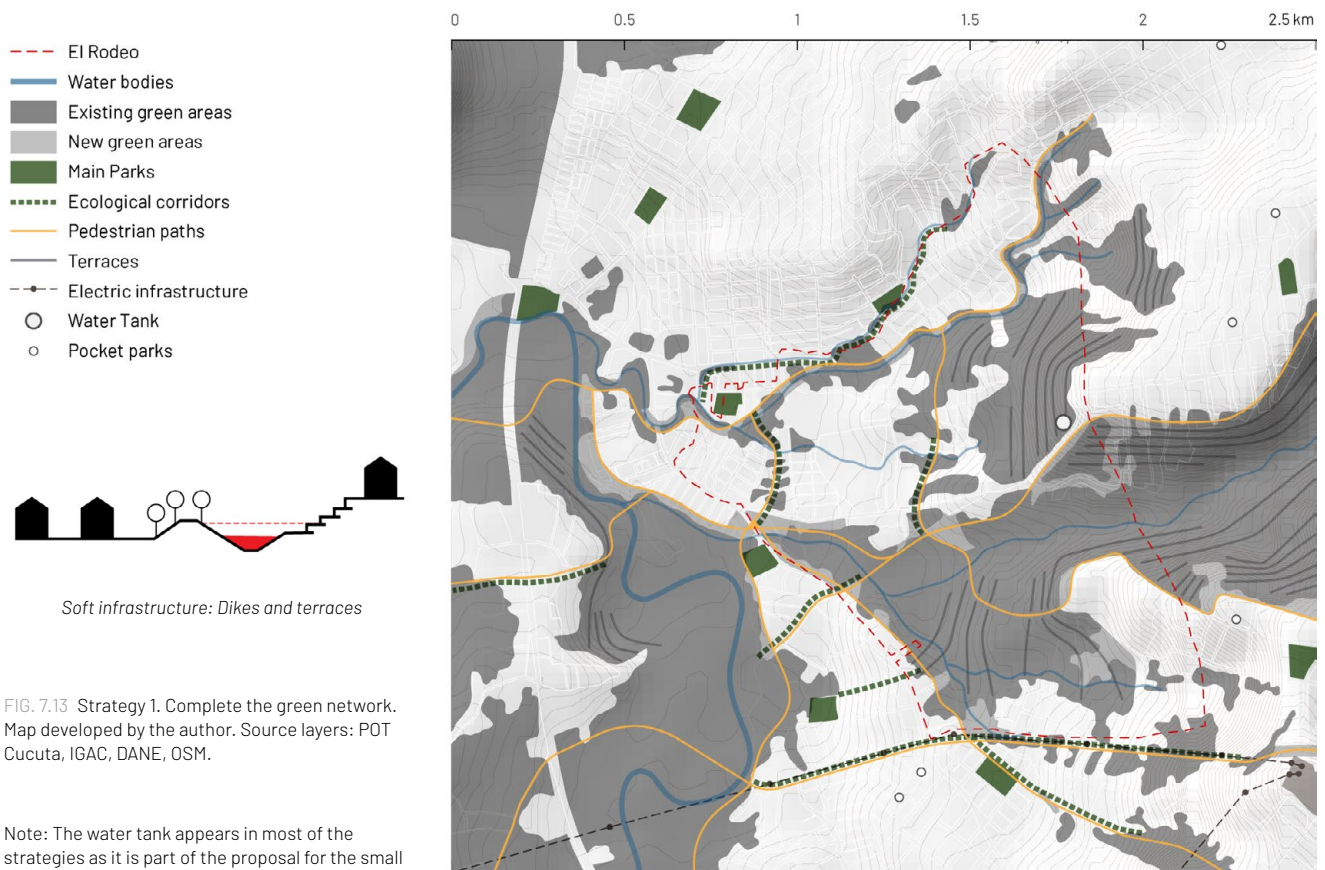


FIG. 7.13 Strategy 1. Complete the green network. Map developed by the author. Source layers: POT Cucuta, IGAC, DANE, OSM.

Note: The water tank appears in most of the strategies as it is part of the proposal for the small scale.

### Strategy 1. Green network

El Rodeo is located in the valley of *Las Brujas*, where the city grows towards the centre of the canyon in the shape of a bottleneck and ‘squeezing the creek’. As a result, the pressure of the urban fabric on the landscape becomes its own threat. On the same way, this green edge that divides the south of Cucuta, is the largest corridor that connects the city with the surrounding landscape. Unfortunately its ecological potential is hampered by the lack of planning and informal occupation. Transforming this edge into a border park would help to reduce urban sprawl over high-risk areas of landslides in the steeping slopes and flooding in the shallow slopes of the valley. At the same time, the park would benefit people from El Rodeo and the entire city as they could have access to green open spaces that were previously in disuse. This green backbone would also improve the biophysical connectivity of Cucuta and recover part of tropical dry forest, of which a small extension remains in this valley.

The second element of this strategy is connecting pocket parks with vacant lots through pedestrian paths to improve the local connectivity. These paths also play an important role as they become new limits to retain the occupation of natural reserve areas. The third element is manipulating the topography with terraces made of basket gabions where necessary. These elements can help to reduce erosion, create space for urban agriculture and safeguard existing constructions from flooding and landslides.

- - - El Rodeo
- Water bodies
- Dikes
- ▨ Flooding areas
- ▨ Retaining ponds
- ▨ Rodeo & Resumen watersheds
- Centre of the blocks

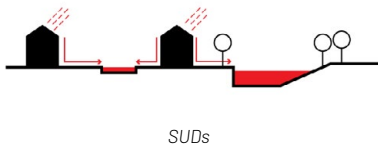
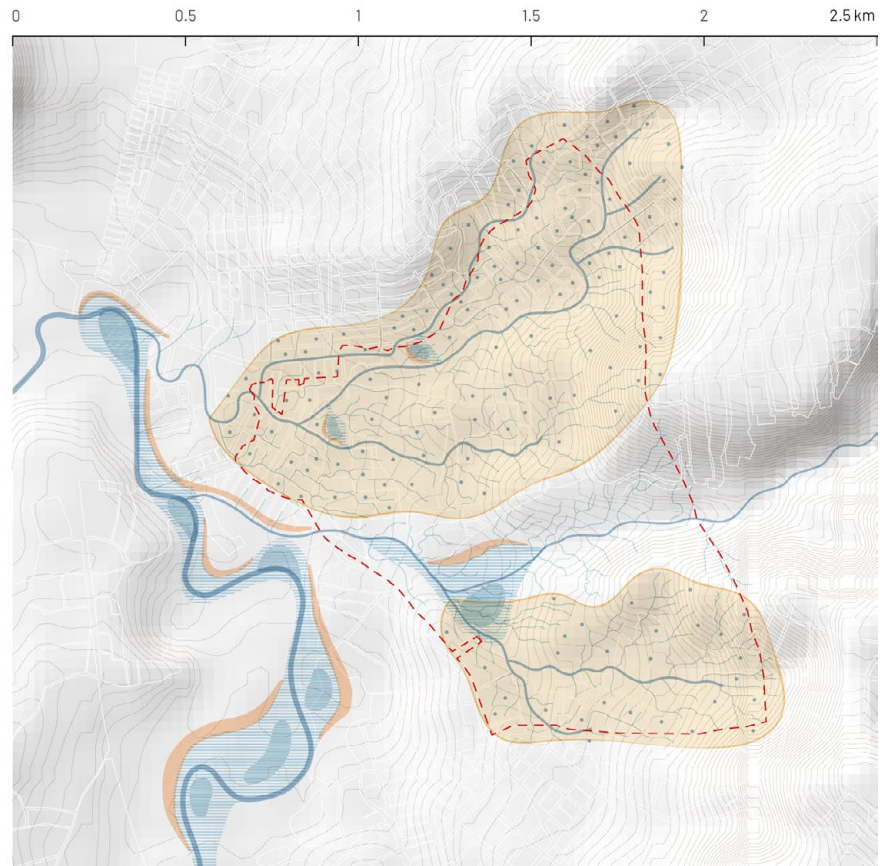


FIG. 7.14 Strategy 2. Water management.  
Map developed by the author. Source layers: POT Cucuta, IGAC, DANE, OSM.



From ownership-based governance



To watershed-based governance

## Strategy 2. Water Management

For years, Colombian society has neglected water bodies as the back of their cities. Creeks and rivers are still used as part of the sewage system, augmenting water pollution and becoming a threat to its inhabitants. It is time for a new water management paradigm, where communities are more resilient to flood risk. Instead of relying on hard infrastructure, it is possible to move towards soft infrastructure solutions and 'organize different landscapes by following local micro-conditions' (Secchi & Viganò, 2011).

Understanding green plots and open space at the centre of the blocks as SUDs for water infiltration can help to reduce runoffs downstream. Therefore, this strategy envisions a new model of governance based on the watershed structure instead of the current model based on land ownership. The best example of this is the waterboards established in the Netherlands in the XIII century. First, as an informal institution to pump water out of the territory and today as regional cooperation and strategic planning body. Applying this concept to El Rodeo can be a starting point for a bottom-up approach in local planning for Cucuta.

Based on the topographic conditions, the watershed is divided into *El Rodeo* to the north and *El Resumen* to the south of the Creek. These are the names of the old *Ejidos* or parcels before the informal occupation of these lands and can be used to call the new waterboards.



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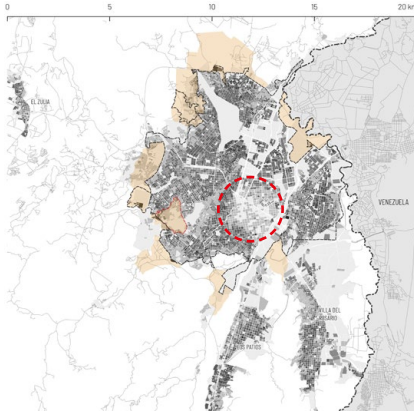


FIG. 8.1 (Above) Map of density showing the average of inhabitants per hectare in the AMC. The city centre of Cucuta is the business and commercial district and has one of the lowest density rates in the city. Source: DANE and OSM. Developed by the author.

FIG. 8.2 (Previous page) People walking on the ring road of Cucuta, where there is lack of public transport and sidewalks. Photo taken by the author.

FIG. 8.3 (Below) Stairway of Cristo Rey facility at the historic centre of Cucuta. Photo taken by the author.



## 8 – What if Cucuta has efficient accessibility at its edges?

### 8.1 – Diagnosis and description of the scenario

The historical maps of Cucuta show an evident break between the urban pattern of the city centre, based on the Spanish grid and the occupation after the 1970s in the upper part of the hills. Informal settlements took over the land on the city's edges, where topographical conditions deter good accessibility. Over time, this issue has increased in parallel to population growth and the fact that most of the business and commerce is located in the city centre. In addition, more and more people want to live out of the city. Suburbs and gated communities are the housing trend for high and medium-income families.

Bierman Suarez, an architect of the AMC, explained that this centralised pattern of urban growth and the inefficient coordination of public transport leads to long-distance commuting and traffic jams in Cucuta. Several private companies provide public transport around the city and are constantly fighting to control transportation routes. All of these routes pass through the city centre where there is a lack of bus stations, meaning users can request the driver to stop the bus at their most convenient spot. In the meantime, people have to wait for long times for buses to pass in areas like El Rodeo. For instance, workers from the CMD take 20 minutes by car and more than 40 minutes by bus to get from El Rodeo to the city centre, just eight kilometres away. Therefore, some of them prefer to take a taxi at a higher cost.

One of the few clear proposals in the POT is the plan for the transport network. This proposal comprises the towns of Villa del Rosario and Los Patios. It includes a BRT lane along Comuneros Avenue, which crosses the city from east to west; a set of inter-modal stations to connect the BRT with secondary bus routes; and bike lanes in some of the main roads of the city. Nevertheless, neither El Zulia nor the expansion areas of the city are included here. Moreover, the AMC is also working with consultants from Spain to get the knowledge to improve public transport under a single entity. This strategy would bring a modern system of payment based on cards instead of cash. Also, by enhancing coordination of traffic lights and the regularisation of bus stops. However, if these initiatives are not carried out shortly, the next administration might hinder its completion.

This scenario envisions Cucuta as an integrated city in terms of mobility and activities, where a strong network of public transport and bike lanes can connect every neighbourhood of the city. Thus introducing new modes of transportation, such as funicular trams and cable cars, will improve the connectivity in areas with complex topography. In this way, the city should be accessible to all its inhabitants, prioritising pedestrians and bicycles instead of cars. Although, this scenario could only work correctly by reducing the commute between work and home. We will explore the topic of centralities in the next chapter.

Global R. 25,000

Local R. 2,500

Angular Choice



Angular Integration



FIG. 8.4 Space Syntax analyses for Cucuta. Run with Depthmap, UCL. Maps developed by the author with the street network of OSN.

## Legend

### Borders

- Border
- Urban Perimeter 2019
- El Rodeo\_2013

### Roads

#### Transport Network (Projected)

- Stations
- BRT
- Transport SITM
- Road Network
- Projected Roads

#### Airport

#### OSM\_Main Roads

- trunk
- primary
- secondary

#### Occupation

- Expansion areas 2011 - 2019

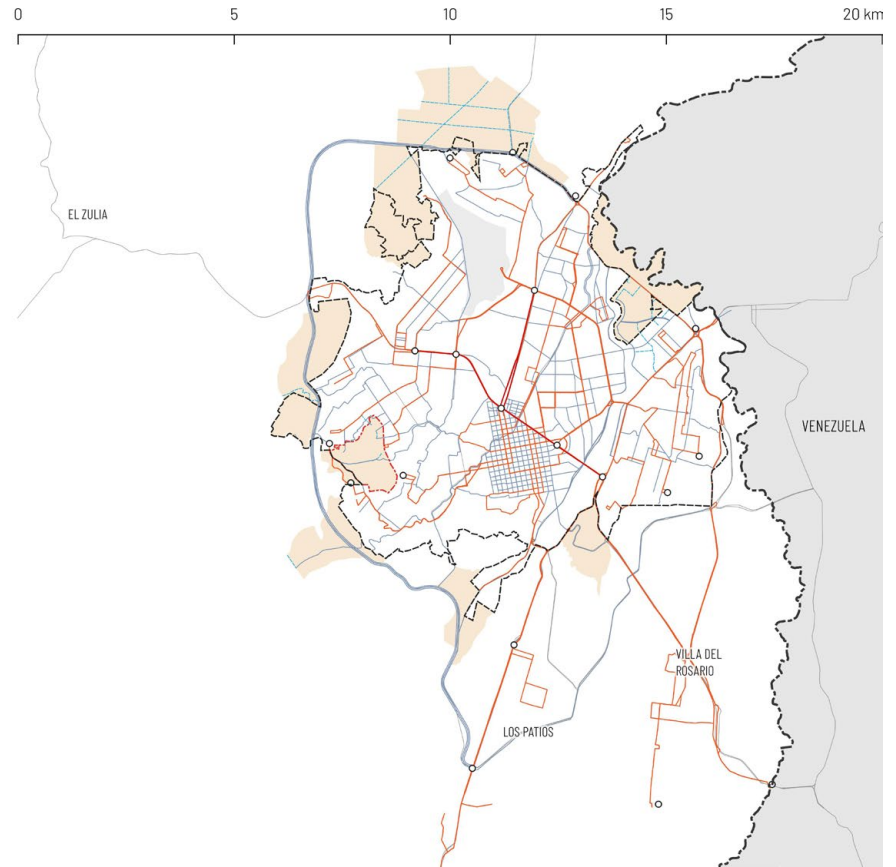


FIG. 8.5 Transport network plan. One of the few clear proposals from the POT. Source: AMC. Cucuta POT.

The space syntax analyses show the through movement and the to-movement of Cucuta at a global and local scale. On the one hand, the city has very few avenues that cross it from side to side. Instead, they all converge on the city centre, which has the best angular integration and thus, most of the jobs and other activities take place. On the other hand, the local level draws attention to how the city is grouped around five centralities with very poor connectivity between them. This fact is due to the topography, rivers and the airport that divide the city in terms of transport. These missing links also generate intense pressure on the few connections, as it happens on the main road that crosses the valley of Las Brujas at El Rodeo (See the area highlighted on angular choice map R.2500).

But how to make this scenario possible in centralised governance? As in many cities, everything related to transportation depends on top-down decisions, and the interest of citizens remains in the hands of the political will of their leaders. Unfortunately, many of the transportation projects never succeed in the transition between mayors. In conclusion, Cucuta needs to invest in infrastructure of all kinds and informal education to implement new strategies. Consider the case of the bike lanes. Due to the warm weather, the topographic conditions and the lack of infrastructure, people might not use the new bike lanes, as explained by one of the interviewees during fieldwork. Undoubtedly, this measure helps to reduce air pollution and should be on the foreground of discussion.

## 8.2 – Reference Projects



FIG. 8.6 (Above) Funicular railway in Lisbon. Source: <https://unsplash.com/s/photos/lisbon-tram>



FIG. 8.7 (Right) Cycleways in Bogota, by the Mayor's Office of Bogota. Source: [twitter.com](https://twitter.com)

## 8.3 – Reference Projects

The case of the cycleways in Bogota is a good example to introduce the topic in Cucuta. Something that started as a temporary activity became an important mode of transport, even before Covid-19. The first movement took place in 1974, a day in which citizens took over the streets to give space for bicycles and pedestrians, in the form of protest against air pollution caused by cars and the lack of spaces for recreation. Some years later, the transport secretary introduced the cycleways as exclusive roads for bicycles during Sundays. This strategy remains until today and connects a significant part of the city through sport and recreation. Nowadays, the city has 550 km of permanent bike lanes and over 80 kilometres more of temporal cycleways (IDRD, 2020).

Cucuta has already implemented a temporary cycleway, but it only works during Sundays at Libertadores Avenue (road along the Pamplonita River). If the city promotes a temporary network of cycleways all over the city, it could create awareness and motivate people to use more bicycles. In the beginning, some lanes can be used as exclusive cycleways by painting colourful signs on the road. On a second stage, the municipality can build bike lanes to improve short-distance commuting. This solution can help to reduce the use of motorcycles, taxis, cars and boost the industry of bicycles.

A second reference for steeper slopes is the funicular railway in Lisbon. The city has three funiculars or trams, which were built by the end of the XIX century. These lifts are still in use by locals and tourists, becoming part of the city's cultural heritage. This strategy could be implemented in Cucuta, underpinning the local integration with its edges.

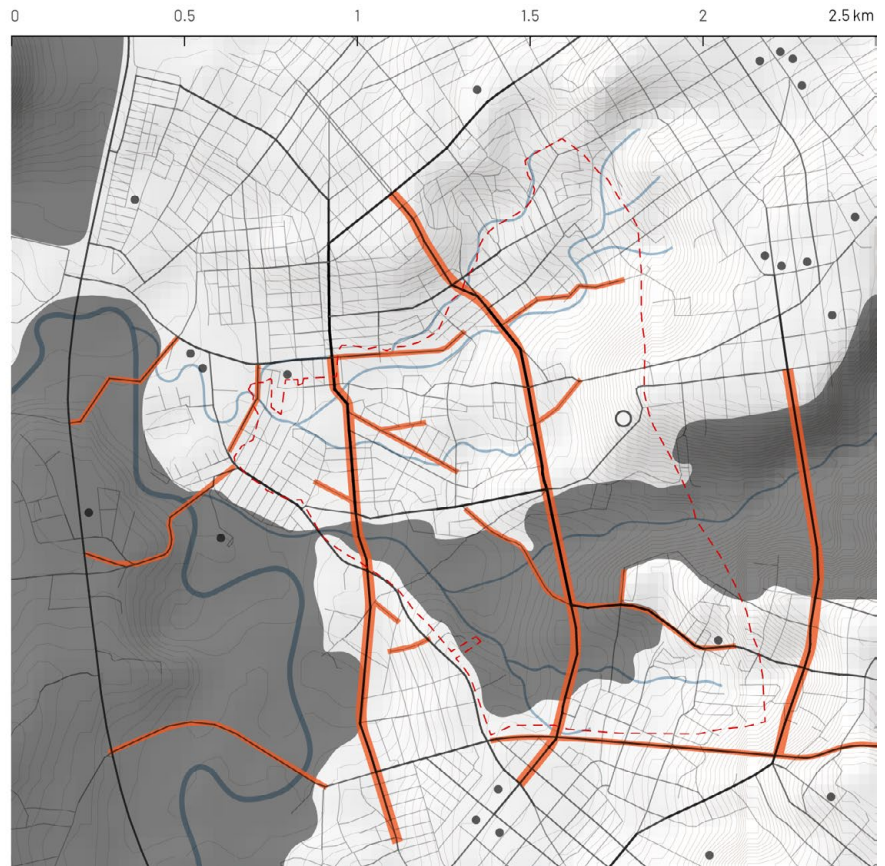
- Edge (the valley)
- El Rodeo
- Water bodies
- Main streets
- Secondary streets
- New streets proposal
- Facilities
- Water Tank



Better connectivity and integration

FIG. 8.8 (Right) Strategy 3. Complete the street network. Map developed using the angular choice analysis for the proposed street network R. 2500. Developed by the author. Source layers: OSM, USGS, POT Cucuta, Google Earth.

FIG. 8.9 (Below) Angular Choice analysis (R. 2,500) of the current situation in El Rodeo. Map developed by the author. Source layer: OSM, Depthmap, UCL.



## 8.4 – Accessibility strategies for El Rodeo

### Strategy 3. Complete the street network

Completing the street network would be possible to have better connectivity and provide better public transport. As a result, a better integration will occur at different scales to envision a more inclusive city. In El Rodeo, new businesses will spontaneously appear on the streets with higher integration, consolidating the structure of local centres. Therefore, replicating this strategy in other city areas can lead to a decentralization of activities from the city centre. But this idea is part of the fifth and sixth strategies.

This exercise extrapolates the current situation to show the development of a street network and its implications on the urban fabric. After doing the space syntax analyses for El Rodeo, it was possible to determine which streets had a high integration in the network. The first action of this strategy is to improve the number of connections across the valley, helping to reduce the pressure on the only link between districts eight and nine (north and south). The second action is to extend the dead ends of the street network under development, considering the topographic constraints. The third action is to identify the pedestrian paths using a satellite image to include them as part of the street network. Finally, running a second analysis with Depthmap to show the integration of the new links.





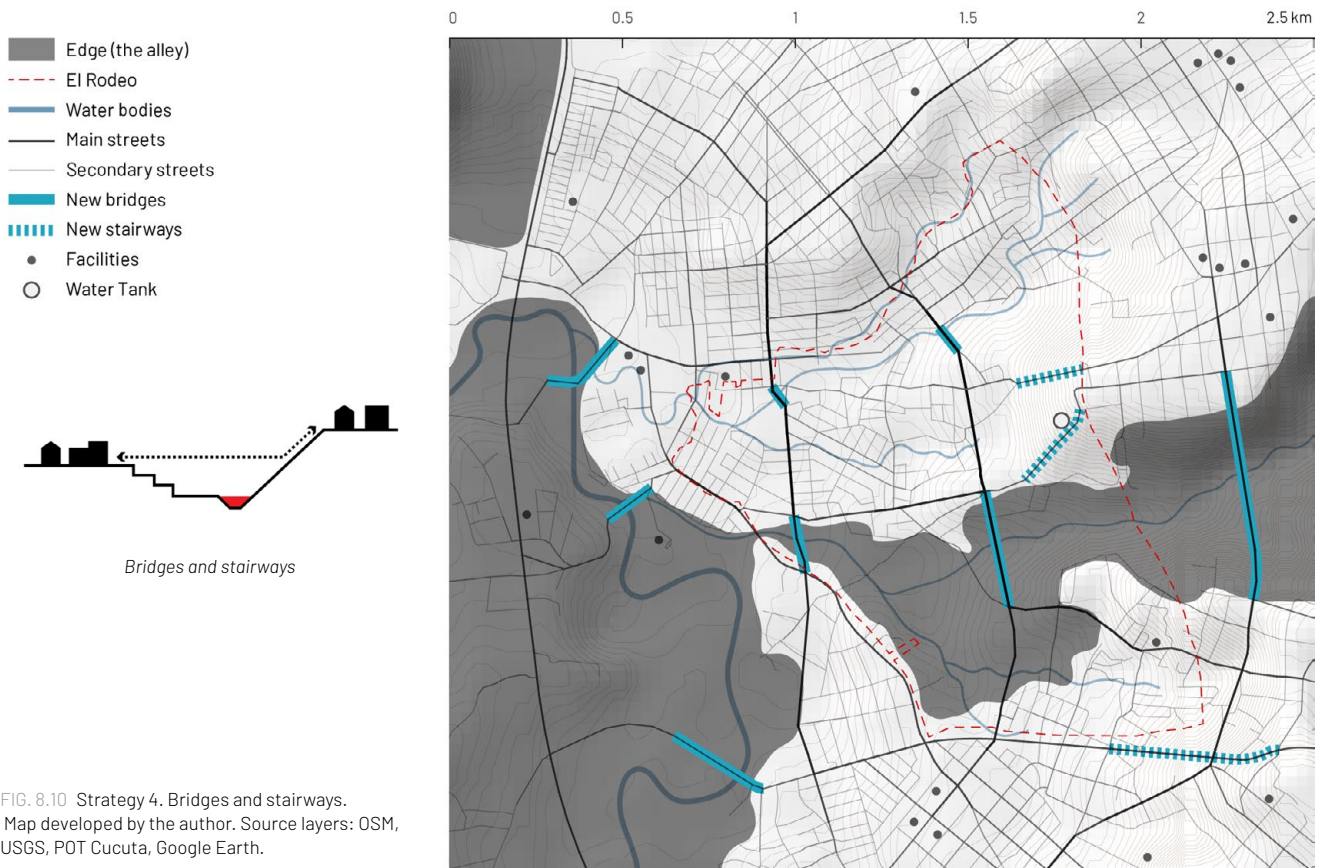


FIG. 8.10 Strategy 4. Bridges and stairways.  
Map developed by the author. Source layers: DSM, USGS, POT Cucuta, Google Earth.

#### Strategy 4. Bridges and stairways

As explained in strategy three, pedestrian paths are key elements to access steep slopes and cross creeks. Improving the paths created spontaneously by people is the first and most reasonable action regarding accessibility in El Rodeo. In Cucuta, as in other cities with low budgets for public works, paths can be underestimated, as they have little added value to the economy. However, they benefit the well-being of people by reducing distances. Following the idea of the local integration of the previous strategy, it is necessary to link some of these paths through bridges and stairways.

The three bridges that cross the Tonchala Creek (left on the map) create new links between El Rodeo and the new settlement that is consolidating next to the ring road. In the same order, these bridges help to shorten distances with the ring road, enabling a better connection with the rest of the city. On the other hand, the new stairways enhance the relationship with the eastern neighbourhoods at the valley's top. Two of them are related to the water tank that can become a public facility, while the third one is along a green corridor that grows below a transmission line. The last bridge on the right is a large-scale proposal that links both sides of the valley in its most prominent slope.



FIG. 8.11 Mega-school in Cucuta: Public schools that gather between 1,500 and 4,000 students of low-income communities. Most of them are overcrowded and some still have two school schedules, morning and afternoon. Photo taken by the author.



"QUE NADIE SE  
QUEDE SIN  
SERVIR."

"SI TENGO...  
Y A LOS PO...  
SERÉ FELI..."

"SABER DAR  
LA MANO Y  
SALIR ADEL...  
JUNTOS."

FIG. 8.12 Mural of Father Rafael García-Herreros at El Rodeo Development Centre (CMD). Photo taken by the author.

# 9 – What if Cucuta has a stronger network of local centralities?

## 9.1 – Diagnosis and description of the scenario

This scenario involves two main topics related to local centralities: facilities and micro-businesses. The first one is more related to the places where kids, youngsters and the elderly meet. The second refers to one of the primary sources of income for low-income families in Cucuta.

**Facilities.** In the previous strategy, the space syntax analyses showed how all the main roads pass through the city centre, centralising activities. In the same way, the analyses for the local scale showed there are four local centralities, but the reality is that they have few functions different from housing. Administration, business, commerce, and most cultural facilities focus on the centre, while the industry is located in the north of the city and surrounding municipalities. During the fieldwork, the centralisation of commerce was evident; nevertheless, it was hard to make a judgement about facilities.

To corroborate this theory about facilities, it was necessary to map, classify and run different network analyses for these facilities (see next page). The inventory map shows four clusters for the metropolitan area of Cucuta. The first cluster is along Comeneros Avenue on the west, the second is the extended city centre towards the north, the third is in San Luis to the east, and the fourth is in Villa del Rosario. This map gives an idea of the concentration of facilities but not about their size. The other network analyses help to visualise the lack of facilities in the edges of the city, where the younger population groups predominate (Figure 14.9 Appendix).

**Micro-businesses.** According to the DANE, in 2020, the manufacturing industries represented only 15% of the employment in Cucuta, while most of the people work in the third sector. In addition, the Metropolitan Area of Cucuta has the largest number of micro-businesses dedicated to commerce in Colombia, 40.2% (DANE, 2021). But what is most alarming is that 71% of these micro-businesses are not registered, evading taxes (DANE, EMICRON 2020). These facts show why the government has a new programme to reactivate the country's economy, investing funds to improve more than 2.000 micro-businesses around the country.

This scenario envisions Cucuta as a Metropolitan Area with a strong network of facilities, in which all citizens can access different types of facilities within a ten-minute walking distance. Kids and the elderly can use cultural, recreational, health and educational facilities of the local level without using public transport. Metropolitan facilities also complete this network of a more inclusive city. On the business level, the network of micro-businesses works in coordination with large industries, creating more job opportunities closer to the places where people live.

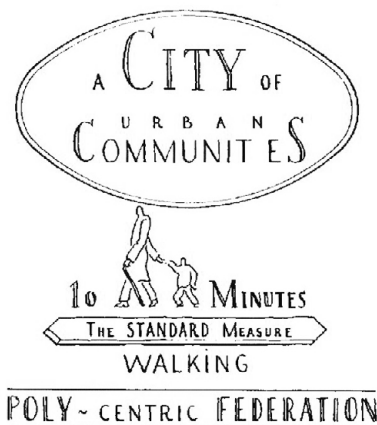


FIG. 9.1 Concept by Leon Krier, in *The Architecture of Community*, 2009.

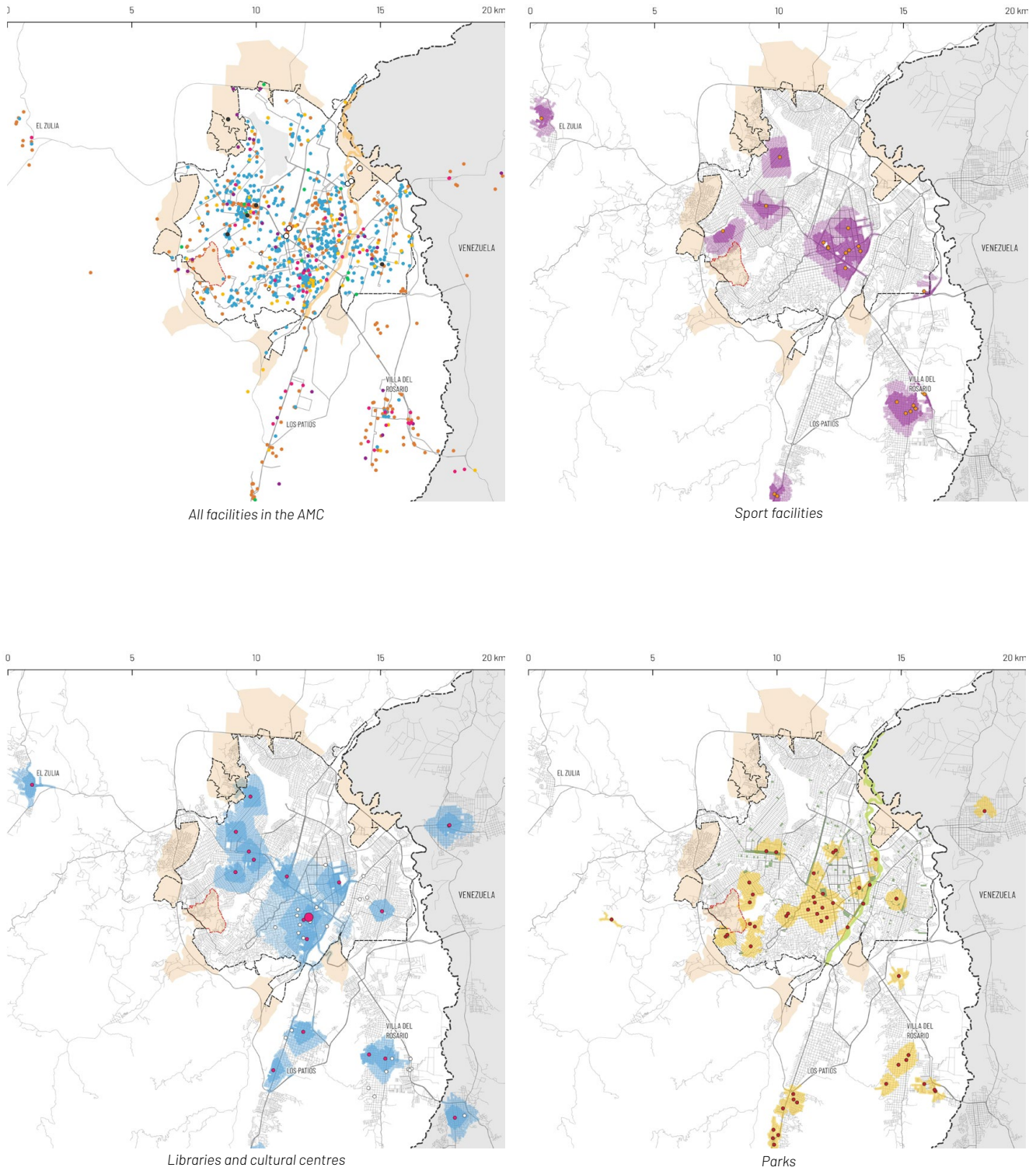


FIG. 9.2 Network analyses for different types of facilities. The darkest patches are in a radius distance of 500 metres walking , while the lighter ones are for 1000 metres. Developed in QGIS with the OSM street network. The layer of facilities was incomplete and therefore modified by the author using Google Maps.

## Legend

### Borders

- Border
- Urban Perimeter 2019
- El Rodeo\_2013

### Occupation

#### Network Analysis

- Service Area 500m\_Culture & Recreation
- Service Area 1000m\_Culture & Recreation
- Expansion areas 2011 - 2019

### Roads

#### OSM\_Main Roads

- trunk
- primary
- secondary
- tertiary
- OSM Roads

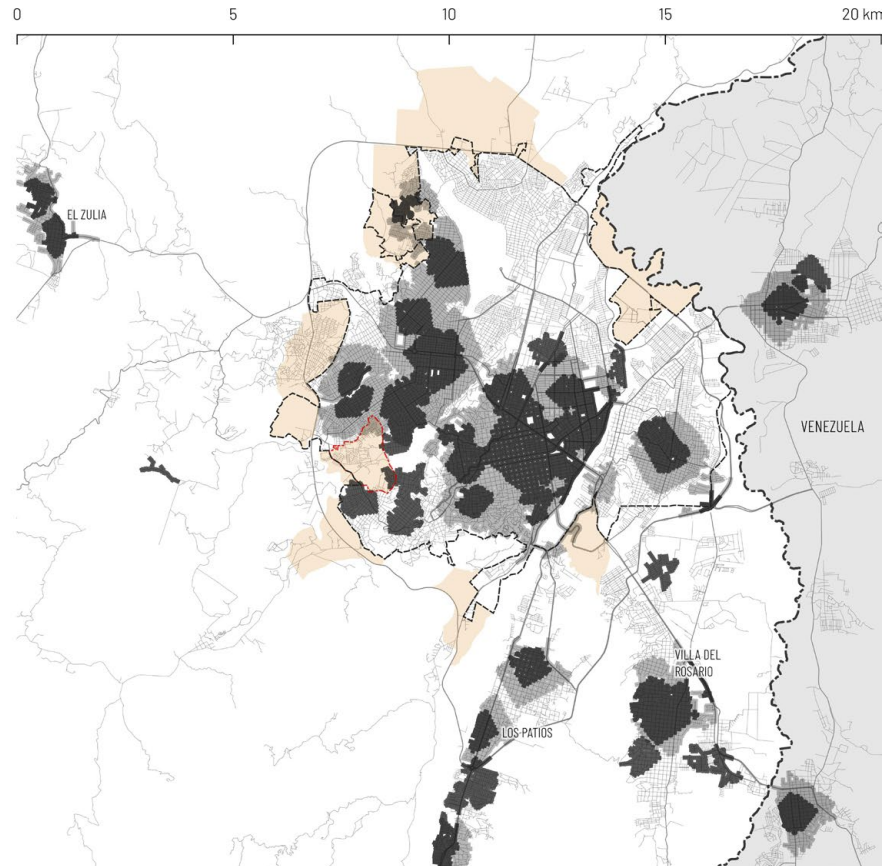
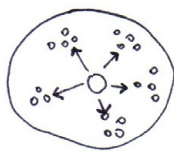


FIG. 9.3 Summary map of the network analyses for cultural and recreational facilities. Developed in QGIS with the OSM street network.

## How to make this scenario possible?



Decentralization of facilities

Regarding facilities, the municipality should consider the location of new local structures according to the needs of the population. Combining all the previous strategies can help visualize the different interventions, aligning topics of landscape, accessibility and centralities to do better projects. For instance, if the mayor decides to build a metropolitan facility in the expansion areas of the city, but there is no public transport, it will not contribute to spatial justice.

Micro-businesses are a subject that recently caught the attention of the public sector. Before, it was a topic addressed only from an academic perspective. Now, there are policies and national investment, which is a starting point to accept the reality and support entrepreneurship. This can also lead to a revolution in other topics related to informality, such as the legalisation of informal settlements. Being a new area of study means that there is little experience to foresee the final outcome. In that case, having the right stakeholders working on the same arenas is essential to achieve a good result.

The next reference project is a new proposal from the municipality of Cucuta and is aligned to this scenario.

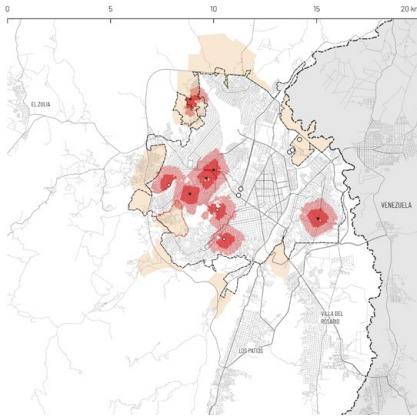


FIG. 9.4 Network analysis for the proposal of Corazon de Barrio in a distance of 500 metres and 1000 metres. Developed by the author with information from QGIS, the AMC of Cucuta and Google Maps.



## 9.2 – ‘Corazon de Barrio’

According to Miguel Peñaranda, Director of the Metropolitan Area of Cucuta (AMC), the Comprehensive Neighbourhood Improvement Plan and the Corazon de Barrio, seek to bring services and local facilities to the most remote areas of Cucuta.

The municipality of Cucuta is developing a strategy called ‘Corazon de Barrio’ (heart of neighbourhood), which intends to create trigger projects in the most deprived areas of the city (also on available land from the municipality). This strategy has also been implemented in Santiago de Chile based on projects in Medellin, Bilbao and Sao Paulo.

FIG. 9.5 (Below) Corazones de Barrio and Niza Sport Complex on the edges of Cucuta. Source: AMC.



Each of these projects aims to offer a variety of activities for the well-being of the surrounding neighbourhoods as well as an administration office to decentralize the headquarters of the municipality. Currently the AMC is in process of development of 5 ‘Corazones de barrio’: Ceci, La Libertad, Kennedy, Comuneros and Scalabrini, each of them in a different district. In addition, there is a set of interventions of public space in phase of design and the development of a sports complex in the northern expansion area of the city.

There is a high possibility that these ‘Corazones de Barrio’ would trigger new developments in the surrounding areas. However, these interventions not always end up improving the living conditions of the people living in the area of influence. Sometimes these projects become exemplary projects for architecture students but not necessarily cope with their initial purpose. But are facilities and public space the only possible intervention? What else can be done from the planning office and the municipality?

In the next section we will explore two reference projects. A water park in Bucaramanga, Colombia, and the lighthouses of knowledge in Curitiba, Brazil. The objective is to put in context the initiative of ‘Corazon de Barrio’ and analyse a possible impact if the municipality implements this strategy in El Rodeo and other edges of the city.

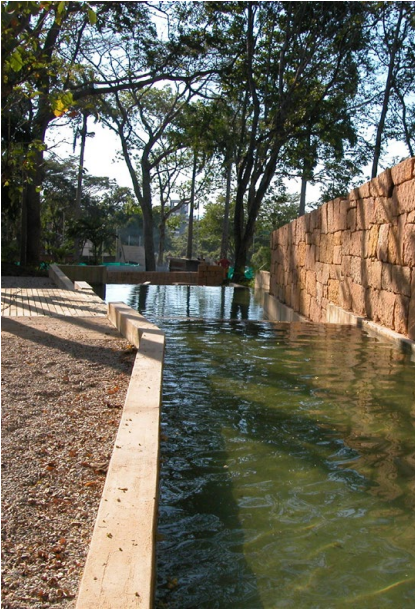


FIG. 9.6 (Above) Water ponds at 'Parque del Agua' in Bucaramanga. Photo: Lorenzo Castro.



FIG. 9.7 (Right) the 'Warriors Path'. Photo: Castro Arquitectos.

**Project team:** Master plan by Germán Samper, urban design by Lorenzo Castro and landscape design by Alfonso Leiva and Michele Cascas.

**Note:** Excerpt from the final assignment for the Landscape Architecture course at KU Leuven.

### 9.3 – Reference projects

#### Parque del Agua

Parque del Agua of Bucaramanga, which means 'water park', was commissioned in 2001 by the Metropolitan Aqueduct of Bucaramanga (MAB) to Lorenzo Castro. The project intends to transform one of the city's water treatment plants into a park by using the hydraulic engineering of existing elements and the steep slope topography. The concept behind the master plan of the project was to recycle existing infrastructures and enhance the ancient trees as part of the place's natural heritage.

It is important to mention that Parque del Agua is a private facility for public use. Therefore, the architect intended to leave an open park to achieve part of its function as a city's peripheral park. Despite the fences imposed by the client, the architect used water elements and sidewalks to distinguish the inside from the outside of the park.

The water park rapidly became a reference project in Colombia for other cities. Since then, 18 parks of the same nature have been built in Medellín. A strategy known as UVAs intends to create local facilities for recreation and informal education, helping to make citizens aware of water management and its correct use. But there are plenty of examples around the world of parks conceived with a double function, of recreation and water reservoir. One of the most distinguished cases is Central Park, designed by Frederick Law Olmsted and Calvert Vaux.

FIG. 9.8 (Below) UVA parks in Medellín. Source: Archdaily









FIG. 9.9 Lighthouses of knowledge in Curitiba, Brazil. Source: <https://www.curitiba.pr.gov.br/noticias/curitiba-agora-tem-33-faróis-do-saber-e-inovacao/56950>



FIG. 9.10 (Previous page) Water staircase at 'Parque del Agua'. Water Park, Bucaramanga, Colombia by Castro Architects. Photo: Lorenzo Castro.

### The Lighthouses of Knowledge in Curitiba, Brazil

The lighthouses of knowledge are an initiative from the municipality of Curitiba to promote reading and informal education for different ages. Curitiba now has 32 lighthouses at schools and nine more at squares. The latter are local facilities that serve the community, offering 'books for consultation and loan, free internet access, and digital inclusion workshops' (Curitiba, 2015). These libraries are located close to bus stops, which makes the network more evident to citizens and visitors. This example might be easier to implement than Corazones de Barrio in Cucuta. The structure is smaller and easier to locate in the expansion areas of the city.

- Edge (the valley)
- - - El Rodeo
- Water bodies
- Streets proposal
- Existing Facilities
- Temporary facilities
- Water Tank
- - \* - Pitches network

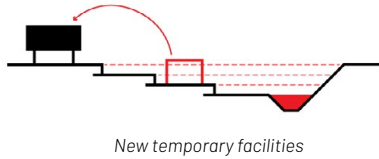
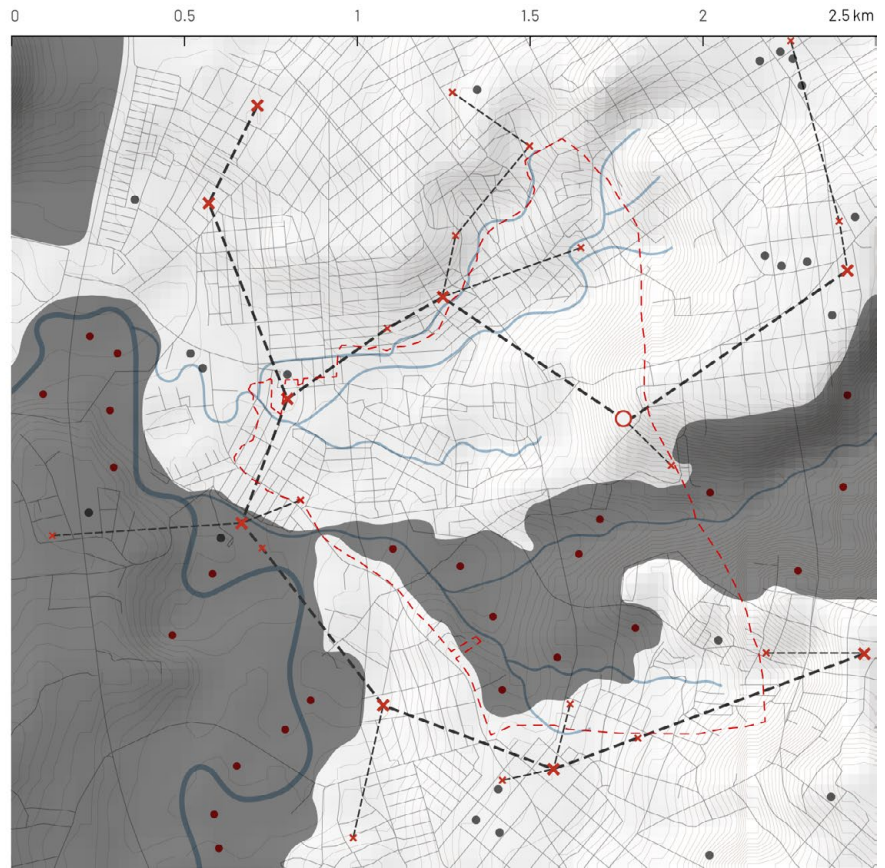
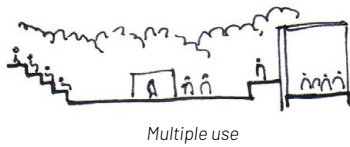


FIG. 9.11 Strategy 5. Retrofit existing facilities. Map developed by the author. Source layers: OSM, POT Cucuta, Google Earth.



## 9.4 – Strategies about local centralities for El Rodeo

### Strategy 5. Retrofit existing facilities

Most of the facilities in El Rodeo are related to well-being and education: public schools, meeting spaces for the elderly and 'salones comunales' for communal activities. There is a lack of spaces for recreation and culture. What it does have are football pitches. Some of them are part of schools and public parks, but the great majority are spaces created by the communities of these settlements. Retrofitting these spaces with bleachers and adjacent classrooms can help broaden the range of activities, such as outdoor cinema, theatre and music events.

In addition, taking advantage of the valley's slope, the CMD could implement an Ecopark on the valley, with activities for the community and attracting tourists. Temporary facilities can appear, such as zip lining in the upper hills or agroforestry in the creek's banks. The appropriation of the valley through temporary activities is essential to avoid informal occupation.

As the city keeps growing in this area, creating more and larger facilities is also necessary. Instead of occupying more open space, it is possible to reuse existing structures, such as the water tank between El Rodeo and the upper neighbourhoods of the valley. This tank is part of the key projects and is explored in chapter 11.



FIG. 9.12 Reference project of an Ecopark : Legends Tournai, Belgium. Source: en.visittournai.be

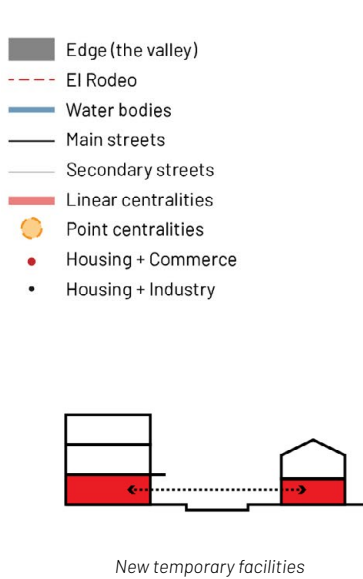
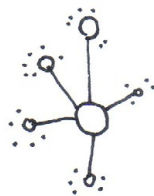


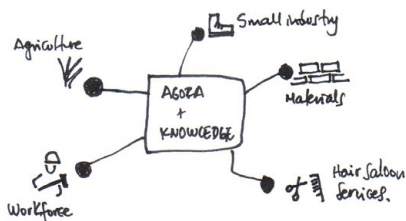
FIG. 9.13 Strategy 6. Underpin the network of micro-businesses. Map developed by the author. Source layers: OSM, POT Cucuta, Google Earth.

### Strategy 6. Underpin the network of micro-businesses



Local productivity network

Most Cucuta relies on the informal economy, and El Rodeo is not the exception to the rule. Many of these families have micro-businesses in their homes: grocery stores, hairdressers, bakeries, auto repair shops, printing and internet services. Other people work in the construction sector and similar jobs classified as low-skilled labour. During the Covid-19 lockdown, many lost their job, and many others stop receiving revenues. There is also a high percentage of Venezuelans living in this area who depend on transitory jobs.



Places of exchange and training

In alliance with the mayor's office and investment from the national government, El Minuto de Dios seeks to promote the micro-business network affected by the pandemic. They have a programme to provide non-formal education on entrepreneurship, savings management and technical knowledge. For this, it is essential to create meeting and training spaces close to where people live. Therefore, this strategy aims to consolidate local centres with new areas to exchange goods and knowledge. Institutions like El Minuto de Dios and SENA<sup>1</sup> can provide training in business management and other tools.

<sup>1</sup> SENA is the National Learning Service. They offer free training in technical programmes.



# 10 – What if Cucuta promotes alternative solutions to upgrade informal settlements?

## 10.1 – Description of the scenario

In the fourth chapter, the review of the POT showed that informal settlements are not considered in the city's plan. There are also no strategies to avoid the occupation of high-risk areas. Overall, the analysis demonstrates how the POT has an extensive diagnosis of the territory by layers, which lacks coordination in the moment of formulating solutions. Instead, the planning office is 'legalizing and regulating'<sup>1</sup> an existing reality so that the government can upgrade these neighbourhoods and recognize them as part of the city. This situation is better described by Lauren Andres et al.:

*'It is important to distinguish between planning as a formal process, which tends to ignore and reject informality, and the more informal processes of alternative-substitute place-making, which enable individuals and communities to shape their living environment.'* (Andres et al., 2021)

This scenario envisions Cucuta as a city that includes its citizens in the design and development of the city, putting above all the physical values of the territory and the well-being of its inhabitants. The city implements a special plan to consolidate and integrate its edges. These transitional territories follow special regulations for informal settlements and receive support from the government to develop collective projects. This inclusive scenario welcomes the entire population, regardless of their nationality, race or beliefs.

### Policies and theories in similar contexts

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Legalisation and regularization of informal settlements are also common in Peru, Mexico and Brazil, with particular variations. According to Edesio Fernandes, the legalisation of property is considered in Peru as a trigger to 'promote private investment in housing, facilitate access to official credit and markets, and alleviate poverty' (Fernandes, 2011). However, through his research, he concluded that formal tenure had little impact on these aspects. On the other hand, the property of values increased by almost 25%.

FIG. 10.1 (Previous page) Social Housing units for sale in the flooding areas of the Tonchalá Creek, Cucuta. Photo taken by the author in 2020.

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<sup>1</sup> Terms used by the legal department of El Minuto de Dios, referring to the legalisation process.

In the case of Brazil, there is a much broader approach to regularization. It 'combines legal qualification with the improvement of public services, job creation and structures for community support' (Fernandes, 2011), which is the current case of Colombian policy, known as (Mejoramiento Integral de Barrios) Comprehensive Neighbourhood Improvement Program. But it is also believed that these programs are the cause of the expansion of informal settlements, as they provide solutions to pathologies. Unfortunately, there is very little research about planning in spontaneous contexts, and informality is always addressed in terms of prevention and upgrading.

In the next part, we will look at two reference projects about collective initiatives in formal and informal situations.

## 10.2 – Reference Projects

Collaborative housing is an umbrella concept, according to Dr. Darinka Czischke from TU Delft. It is presented under different names such as co-housing, Community Land Trust (CLT), cooperative housing, which corresponds to variations of the model adapted to the conditions of each context. They are all self-managed projects and in some cases collaboratively self-built.

### CLT in Puerto Rico (Caño Martín Peña)

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FIG. 10.2 San Juan's Caño Martín Peña community before the Enlace project. Photo: Stephanie Maze. <https://www.theguardian.com/>

Caño Martín Peña is a Community Land Trust called established in 2004 in Puerto Rico. By 2002, almost half of the families living next to the Caño (channel) had no title deeds of the land where they lived. These informal settlements also had an issue of water pollution as the sewers discharged into the channel. The municipality of San Juan started a program to recover the estuary of the channel, and real estate speculators began persuading the families of selling their homes at a very cheap cost. To avoid gentrification and achieve security in land tenure, the Caño communities created a CLT.

Caño Martín Peña is composed of eight communities of more than 2,000 families, who are co-owners of 78.6 hectares of land (Algoed, Torrales & Ribeiro, 2020). The residents can sell and inherit their houses but not the surface where the house stands. This solution was possible after the constitution of the ENLACE project, a public corporation responsible for the coordination of dredging the channel, the construction of water infrastructure, the relocation of families and the land transfer to the CLT.

Community participation was paramount in creating the project, but support from the government was also essential in all process stages. The funds to recover the channel came from the US government, while the local administration designed the policies and the Special Development Plan. In addition, the model was an adaptation of a CLT in Boston into the informal context.



FIG. 10.3 'The land is ours'. Photo: Proyecto Enlace in Caño Martín Peña, Puerto Rico.

Are property rights more important than the right to housing?

### Definition of property rights



**Property rights.** "Subjective right that every person has over a corporeal or intangible thing, which empowers the owner to use, enjoy, exploit and dispose of it" (Source C. Const., sentencia de constitucionalidad C- 133 de 2009, C- 410 de 2015, reiterada por la sentencia SU- 454 de 2016.)

As expressed in the Constitution, the concept of property was initially conceived in Colombia from an individual perspective. But since the reform of the legislation in 1936, the public interest limits and prevails over individual rights, implying social and ecological obligations for the private domain. Even so, there is a big gap between these policies and the commodification of land and housing in Colombia.

One of the most remarkable examples of the collective domain in Colombia is indigenous reservations, which remains in some parts of the country. Despite receiving protection by law, the territory of the Mutilon-Bari tribe in the region of Catatumbo continues shrinking by extractive practices and guerrilla warfare. Hence, Community Land Trust is not a new concept in the Colombian context. Instead, it invites us to reflect on the way we conceive property rights.

FIG. 10.4 In May 2021, more than 1500 members of the Motilon-Bari tribe did demonstrations in Cucuta to protect the social rights of their ethnic group. The population demands the expansion of the indigenous reservation in the Catatumbo region, as dictated by the law T-052 de 2017 of the Constitutional Court. Source: El Tiempo journal and Caracol Radio.





FIG. 10.5 Housing Cooperative in Uruguay. Source: [www.world-habitat.org](http://www.world-habitat.org)



### Housing Cooperatives in Uruguay

The cooperative housing model was established in Uruguay in 1966. First through a pilot project and then enacted by law in 1968. Worker unions (Sindicatos) began promoting collective initiatives to meet the demand for housing of its workers. The Act gives supports cooperatives to access 'long-terms and low-interest loans' (Delz, Hehl, & Ventura, 2020) to build the projects. The first modality is through previous earnings, while the second and most common is called Mutual-Help. The latter is focused on low-income families that are involved in every stage of the construction, which reduces the production cost.

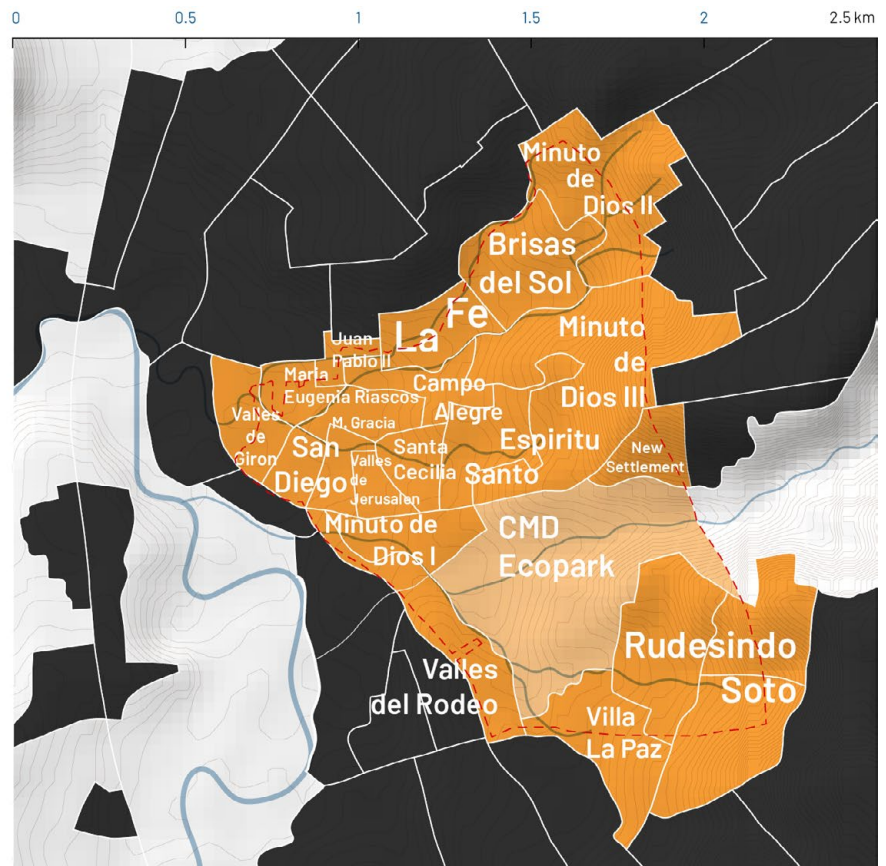
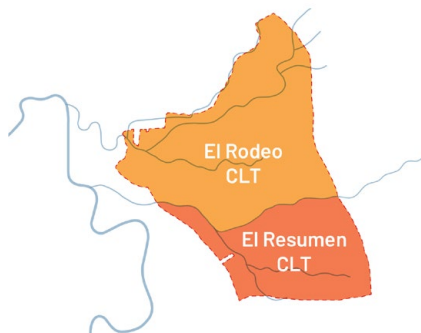
FUCVAM is the oldest association of cooperatives in Uruguay. In 2019 it had 627 cooperatives that benefit more than 12,000 families. Each project receives financial support from the government and technical assistance from private office of interdisciplinary teams. In 2012, FUCVAM received the World Habitat award as an inspiring example of policy transfer. This model has been successfully transferred to 15 countries around Latin America, from which Colombia is not included. There is a lack of legal frameworks to introduce the cooperative model in the country, but with the help of international cooperatives it could be possible to access to low-interest loans to fund a pilot project.

Another important strategy that has no implementation in Colombia is to allow different types of tenure. In the Netherlands, housing associations regulate the stock. There is private-owned, private-rent and social housing. In the UK, Iroko Housing Co-op by CSCB is an example of a project designed for mixed tenure. Part is affordable rental, and part is cooperative with private or shared ownership. To achieve this it is necessary to develop housing policies that prevent gentrification and incentive these kinds of projects.

- - - El Rodeo
- Water bodies
- Topography
- New CLTs by settlement
- CMD Ecopark
- Surrounding neighbourhoods

FIG. 10.6 (Right) Strategy 7. Collective strategies for El Rodeo. (Option 1). Map developed by the author. Source layers: OSM, POT Cucuta, CMD.

FIG. 10.7 (Below) Strategy 7. Collective strategies for El Rodeo. (Option 2). Map developed by the author. Source layers: OSM, POT Cucuta, CMD.



### 10.3 – Collective Strategies for El Rodeo

The two reference projects are examples of successful bottom-up approaches. The cooperative model in Uruguay applies for new housing, while the CLT in Puerto Rico works better for existing settlements. Both initiatives help to illustrate alternative solutions for the legalisation process in El Rodeo. This solution could be more effective than legalizing every settlement and giving title deeds to each family.

Then, which model is more suitable for El Rodeo? If the CMD, as landowner, tries to transform the whole parcel of El Rodeo into a Community Land Trust, then Puerto Rico’s model is the right option. Instead, if they wish to transfer the land independently to each settlement, it is possible to apply both models. However, that depends on different variables: occupation density, classification of high-risk areas, the interest of its residents, etc.

Therefore, this strategy comprises two options. The first option (left map) is to constitute two CLTs using the governance structure of the watershed (strategy 2): El Rodeo and El Resumen. Land transfer and legalisation become easier as there are fewer people involved in decision-making. The second option (right) is to transform each settlement into a CLT or a housing cooperative and group them as an association of collective initiatives. Indeed, this depends on the interest of each community.

0 0.5 1 1.5 2 2.5 km



- |                   |                        |                       |
|-------------------|------------------------|-----------------------|
| --- El Rodeo      | Green Areas            | — Pedestrian paths    |
| — Street network  | Dikes                  | — Bridges             |
| — Water bodies    | Parks                  | ..... Stairways       |
| — Flooding areas  | Green corridors        | — Linear centralities |
| — Retention ponds | Terraces               | ○ Point centralities  |
| Green Areas       |                        | ■ Key Projects        |
| Dikes             | ○ Facilities           |                       |
|                   | ● Temporary facilities |                       |
|                   | × Pitches              |                       |

FIG. 10.8 Strategic map for El Rodeo, showing the sum of strategies that could raise the question for a local planning in the edges of Cucuta. Developed by the author. Source layers: OSM, POT Cucuta, USGS, Google Earth, CMD.

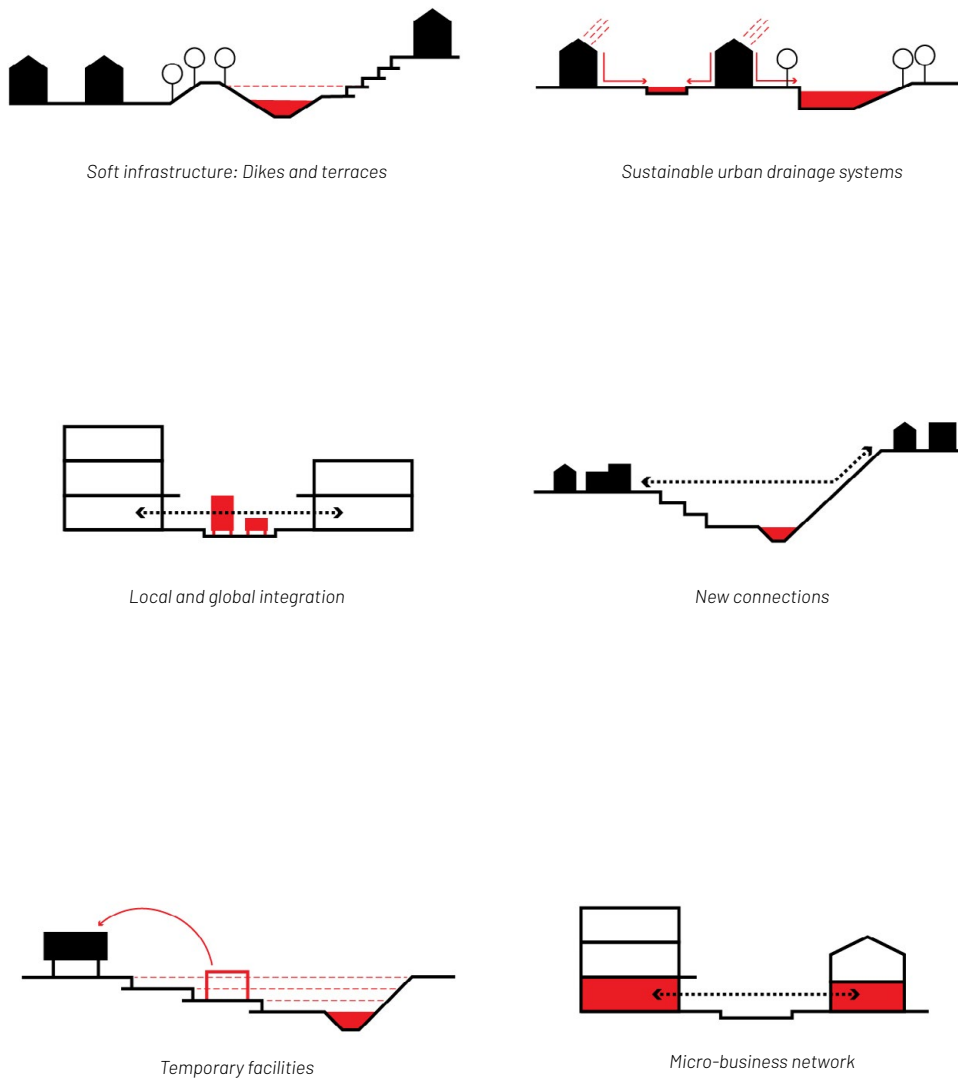


FIG. 10.9 Diagrams for the strategies. Developed by the author.

The strategic map on the left is the first idea of a local plan for El Rodeo. This research-by-design put in evidence the need for a local planning framework in Cucuta that responds to large scale issues from the lower scale. Suppose the planning office of Cucuta replicates this framework in other parts of the city (not only on the edges). In that case, it can be a starting point to translate the POT into strategies that adapt to the specific conditions of each district. This exploration will continue in the next chapter, applying the seven strategies in two key projects. In the conclusions chapter, we will discuss the feedback from the scenarios to the POT.

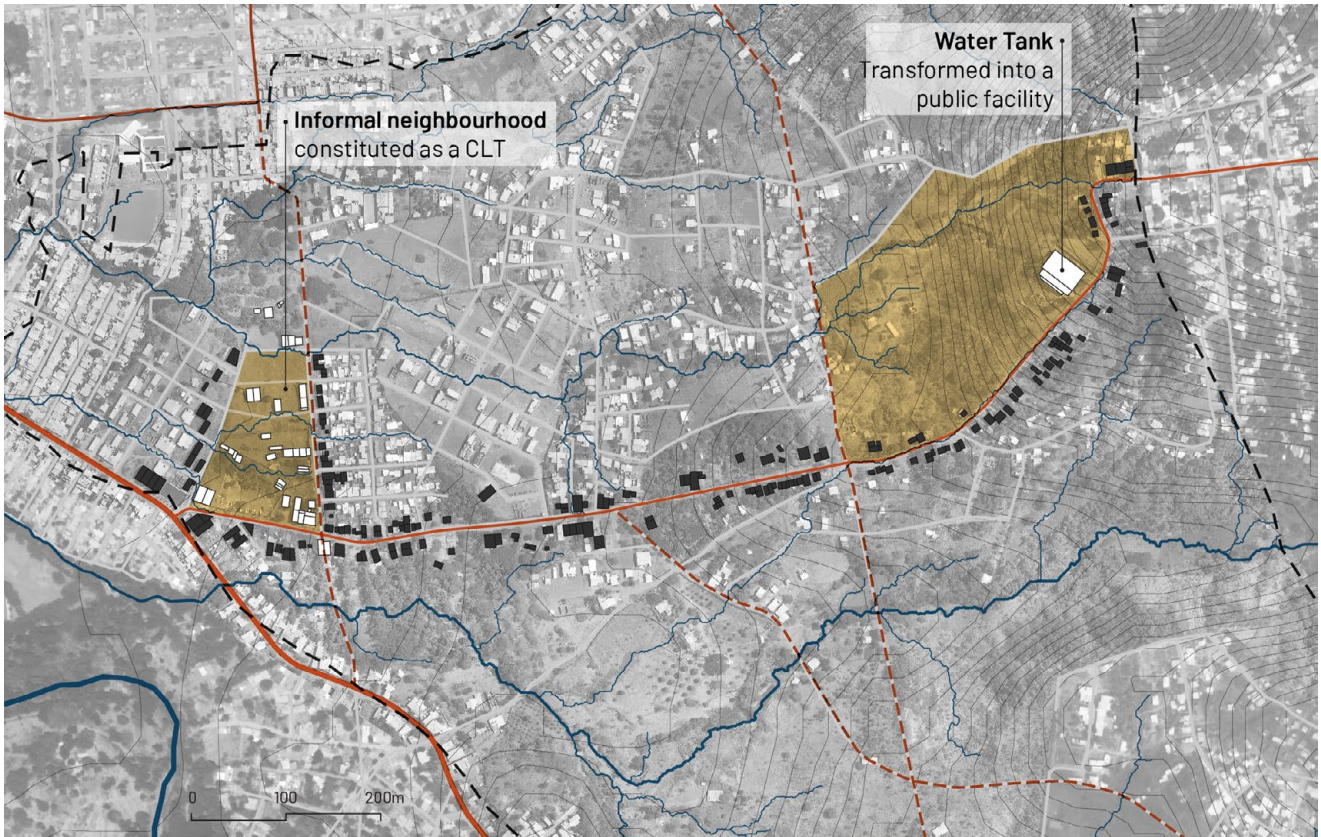
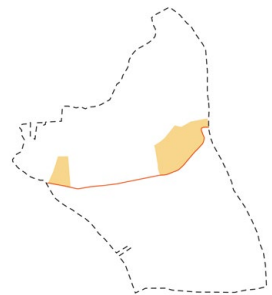


FIG. 10.10 Plan of key projects for El Rodeo.  
Developed by the author.



# 11 – Key Projects

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Application of the scenarios in two key locations of El Rodeo.

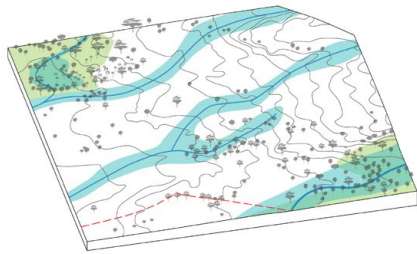
The seven strategies explored in the previous chapter are applied in 2 sites in El Rodeo. The selection of these sites responds to the integration of the key issues at the lower scale: the occupation of high-risk areas, accessibility and local centralities.

The first site is an informal settlement with both legalisation and flood risk difficulties. The idea is to explore collective initiatives as alternative solutions to security in land tenure and risk management in El Rodeo. Three models are tested: The model of Community Land Trust in 'Caño Martín Peña' Puerto Rico, the cooperative housing model in Uruguay and a mixed model between the previous two. Each model has advantages and disadvantages when applying them in El Rodeo regarding density, open space ratio, flexibility, integration in the urban fabric, and governance. The outcome of this exercise can also set a base to introduce collective initiatives in Colombia as ways to access decent and affordable housing. It is important to mention that none of these models has been implemented in Colombia. The most similar approach of cooperatives are organisations that provide low-interest loans for the financialisation of housing.

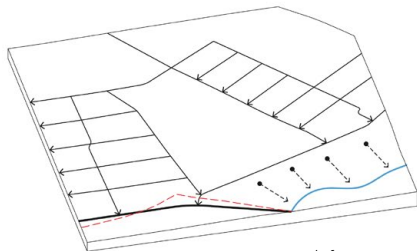
The second site is one of the main water tanks of the city. It is located in an area of rapid consolidation with poor accessibility and a lack of facilities. Due to the steep topography, the crossing of water pipes and power transmission lines, this area is not suitable to allocate housing and becomes a barrier to the consolidation of the urban fabric. This proposal aims to show the possibility of recycling existing infrastructures in Cucuta to provide local facilities on the edges of the city. Taking into consideration that there are 22 water tanks in Cucuta, and most of them are located on steep slopes and areas with poor accessibility. This idea follows the strategy of 'Corazon de Barrio' and the reference project of the water park in Bucaramanga.

## 11.1 – Proposal for a CLT in San Diego settlement

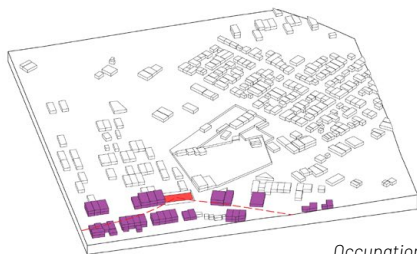
### Current Situation



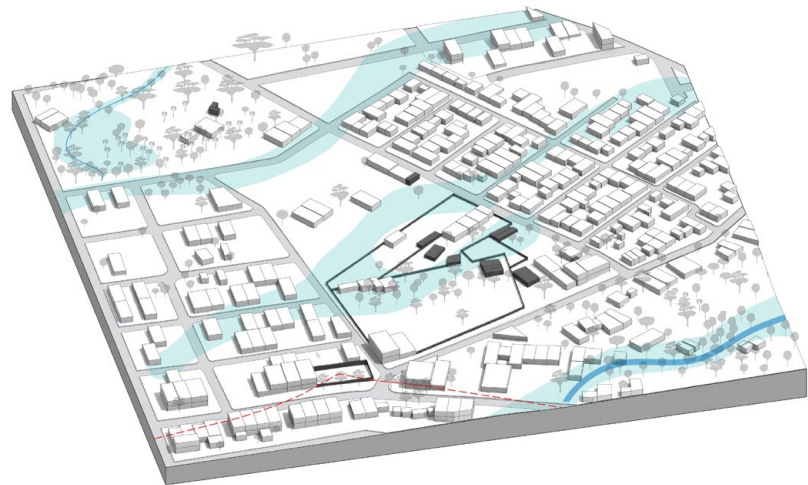
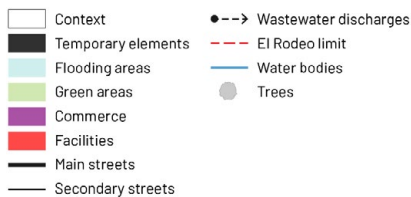
Landscape



Infrastructure



Occupation

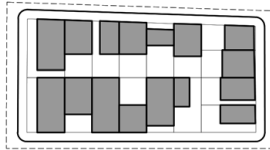


The settlement of San Diego has a strategic location in El Rodeo. On the one hand, it is close to the main road that connects district 8 (North) and district 9 (south) where most of the commerce takes place and the public transport of the south of Cucuta passes through. On the other hand, according to the first strategy for El Rodeo, this area has the potential to become a green corridor connecting the creeks that cross the valley from East to West.

San Diego is also one of the areas with the lowest density in El Rodeo and great part of the buildings are in phase 1 of development. This means that most of the constructions in the settlement are built with temporary materials (elements in black colour in the 3D), therefore it is possible to propose different types of intervention, from urban infill to a complete regeneration. One of the possible reasons for having such a low occupancy in comparison to the adjacent neighbourhoods is the topographical conditions. By looking into the 3D it is evident that the neighbourhoods to the east (uphill), have a larger density than the ones on the west (downhill), which get easily flooded during the rainy seasons. However, the largest storms happen every 10 to 15 years, while the majority of these houses have less than 5 years of construction and its residents have little knowledge about this issue.

In addition, like most informal settlements in the first phase of consolidation, San Diego lacks a sewerage network connected to the public collectors. The water from bathrooms and kitchens is discharged directly onto the creek, worsening the environmental conditions of the water bodies and threatening the health of the population. This problem increases exponentially as we move towards the lower part of El Rodeo.

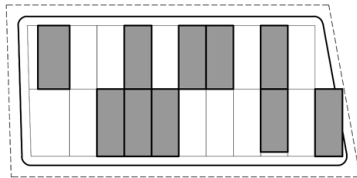
All drawings and map were developed by the author.



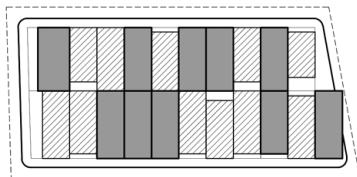
FSI: 0.58      Footprint: 702 m<sup>2</sup>  
 GSI: 0.58      GFA: 702 m<sup>2</sup>  
 L: 1              Plan Area (Island): 1,206 m<sup>2</sup>  
 OSR: 0.72

Scenario in 10 years if half of the houses of the block have 2 floors:

FSI: 0.87  
 GSI: 0.58  
 L: 1.5  
 OSR: 0.48  
**88.6 dw/Ha**



FSI: 0.45      Footprint: 871 m<sup>2</sup>  
 GSI: 0.45      GFA: 871 m<sup>2</sup>  
 L: 1              Plan Area (Island): 1,900 m<sup>2</sup>  
 OSR: 1.22



Scenario in 10 years if half of the houses of the block have 2 floors:

FSI: 1.36  
 GSI: 0.91  
 L: 1.5  
 OSR: 0.06  
**75.2 dw/Ha**

## Density Analysis

In order to foresee the housing capacity of the settlement of San Diego in the future, it is necessary to analyse the density of the surrounding blocks.

In El Rodeo, the majority of the blocks are composed by terraced houses of one floor and the average size of the plots variates between 6x12 and 6x14 metres. In this exercise we will use the concept of the 'island' (Berghauser & Haupt, 2009) to determine the Plan Area of each block and calculate the FSI and GSI of two typical blocks. These blocks are examples of the settlements located to the east and west of San Diego. As can be seen on the 3D, the settlement on the west, has bigger plots than the one on the east. Using the satellite image it is also relevant that the former has better materials than the latter. However the latter has also more built plots per hectare.

## Conclusions

In most of these blocks there are no clear limits of the sidewalks and the front of the plot is usually the facade of the house. When the plots are in phase 1 of development the limit between public and private is usually a fence that later becomes the facade or the porch of the house. It is also difficult to determine the density of these areas as it is in process of consolidation. However it is possible to do predictions of how these blocks will be constituted by looking into the oldest areas of El Rodeo.

- If the GSI is calculated with the area of the plots, then it is very dense as in most of the cases the plot is completely built.

- Blocks with a higher OSR have more chances for new interventions regarding collective spaces. However, in low density blocks, limits are not as clear as in constituted blocks. The smaller the block the network density is higher. Unless it is a superblock with internal networks of public space.

- Most of the plots have one household per plot. However this may variate through time and houses of two floors can appear to have two apartments instead of one household with business on the first floor.

Now the idea is to try out different typologies of housing according to the models of housing cooperatives in Uruguay and Puerto Rico, and determine the difference in density of dwellings and public space per hectare.

FIG. 11.1 Morphology and density per block in El Rodeo. Developed by the author.



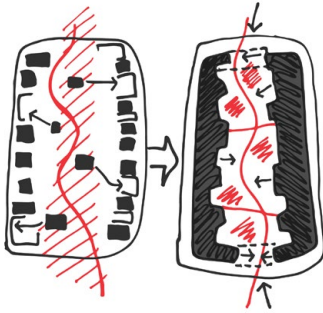


FIG. 11.2 (Above) Concept of densifying on the edges of the block and opening space at the centre of the block.

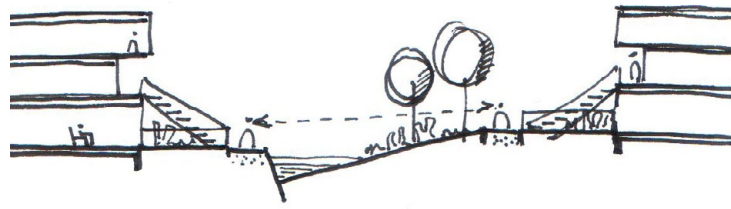


FIG. 11.3 (Right) Drawing of the linear park at the centre of the block. The back of the island transforms into a new front.

Following the set of strategies for El Rodeo, the settlement of San Diego plays a key role in the biophysical connectivity of the territory. Therefore, densifying on the edges of the island enables to configure the front of the surrounding streets and open space for nature at the centre of the block. This linear park can also support the water management strategy through a network of bioswales and retention ponds to reduce water run-offs downstream. -

FIG. 11.4 (Right) Drawing of the water management strategy.

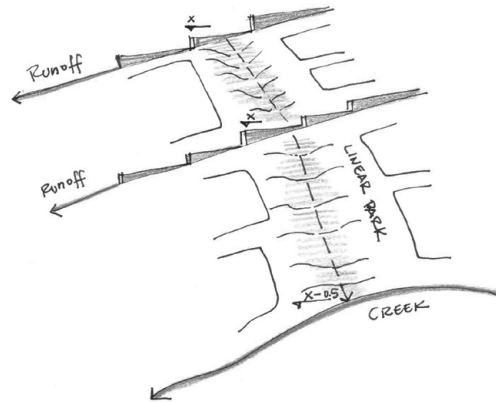
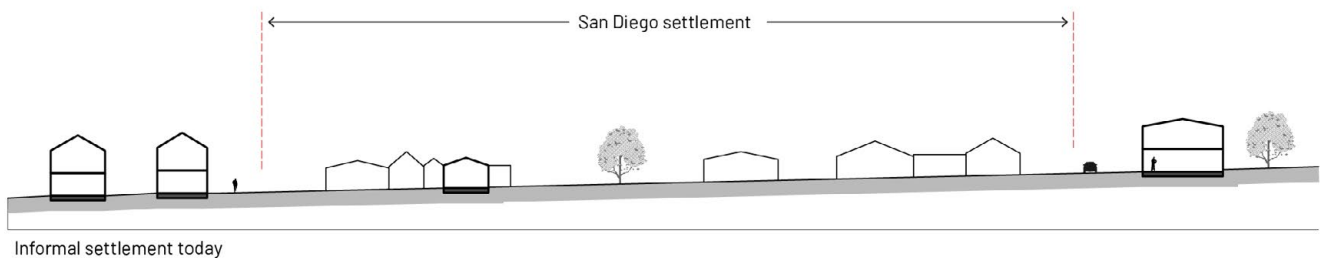
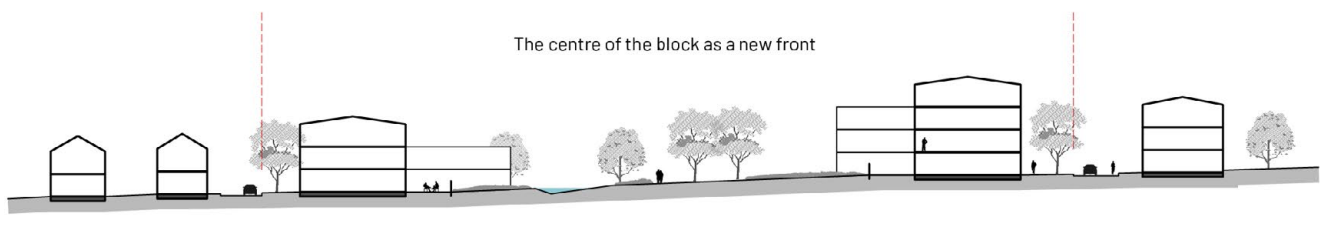


FIG. 11.5 (Below) Sections showing the existing and possible profile of San Diego settlement. All drawings and maps were developed by the author.



Informal settlement today



The settlement as a Community Land Trust in 2030



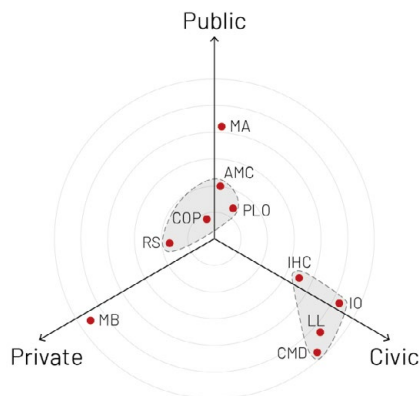
FIG. 11.6 Drawing of the linear park at the centre of the block looking towards the main road. Drawing by the author.



Density: **70 dwellings / Ha**  
 OSR: **1.28**  
 Active edges: **34%**

FIG. 11.7 (Above) 3D for San Diego following the CLT model of Puerto Rico.

FIG. 11.8 (Below) Governance diagram showing the interest of stakeholders involved in the process of development of the CLT.



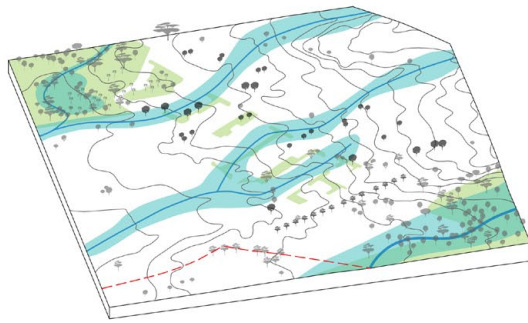
### CLT following the model in Puerto Rico (Caño Martin Peña)

#### Collective Land + Private Housing

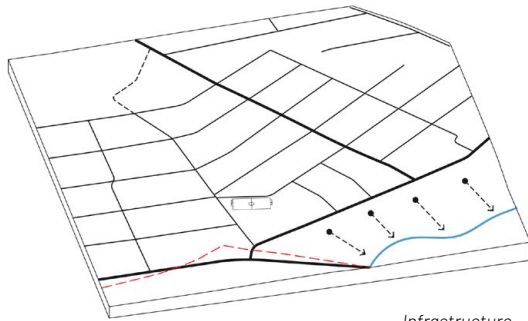
As discussed previously, the model of CLT in Puerto Rico is a reference to consolidate Community Land Trusts in informal settlements. As in a horizontal property scheme, dwellers own individual and collective portions of the property. In this case, the land of San Diego is shared by its inhabitants through a 'surface rights deed' while the houses are owned separately (Algoed, Torrales & Ribeiro, 2020). In other words, the houses can be sold individually but not the land where they are built.

The first and most relevant advantage of this model, is that it can be replied in existing settlements becoming an opportunity not only for El Rodeo but for all the city. Neighbourhoods that have been for more than 20 years without security in land tenure can be incorporated easily to the rest of the city. Reducing the gaps between Cucuta and its edges and enabling a rapid regularization of settlements.

The regularization of informal neighbourhoods and the legalisation of individual parcels usually affect the social ties of these communities as they stop sharing interests for a common good. Instead, the CLT requires participation in decision-making. The governance diagram shows that El Minuto de Dios and local leaders would be the most engaged in the creation of a pilot intervention in San Diego. The CMD could solve the legalisation process by transferring the land to a new



Landscape



Infrastructure



Occupation

- |                       |                |
|-----------------------|----------------|
| Context               | El Rodeo limit |
| Flooding areas        | Water bodies   |
| Green areas           | Existing trees |
| Commerce / production | New trees      |
| Facilities            |                |
| Leisure               |                |
| Main streets          |                |
| Secondary streets     |                |
| Pedestrian paths      |                |

entity e.g. ‘San Diego CLT’ managed by a committee of residents, while international institutions are also essential for funding and knowledge sharing. On the contrary, public institutions might show their interest but maybe not a strong commitment, as there is not a surplus of the land and the construction of urban infrastructure depends on the public realm. Additionally, the private sector has only participation of local residents in the micro-business sector, which are the most interested in securing land tenure.

In terms of landscape, unfortunately it is not possible to meet all the strategies mentioned in the previous chapter. As the occupation will probably take over most of the land, there is not enough space to create a green corridor through the settlement and water management would be reduced to underground drainage. At the beginning improvised sewers will keep discharging wastewater into the creeks until there is a public intervention to recover water bodies and reduce flooding risk. This forecast is based on the current situation of Caño Martín Peña in Puerto Rico, which is an example of a community-based intervention but with a strong dependency on the government support to improve the urban infrastructure.

In terms of occupation, the spontaneous development of the CLT will surely lead to a good integration with the existing urban fabric. This includes a high constitutedness of streets, typical of the informal settlements, with a strong network of micro-businesses along the local roads. In this way, the typology of individual housing is crucial for the location of new commerce according to the needs of its residents and the demand of customers.

However, the typical typology of terraced houses under a collective ownership of the land might also prevent of doing an urban regeneration as the market usually does. This is due to the fact that occupation is controlled by the committee of the CLT, avoiding real estate speculation. Instead, residents would have access to mortgage credits to improve their living conditions individually.

Another consequence of informal practices is the configuration of small blocks of row houses with individual backyards. This goes in the opposite direction to the collective concept of common grounds and the open space ratio is very low as there is a fragmentation between individual gardens and collective spaces. Unfortunately, this kinds of informal initiatives lack of technical assistance for a good practice in construction and coordination between dwellers. As a result people might enlarge their houses and miss the open space of the backyards.

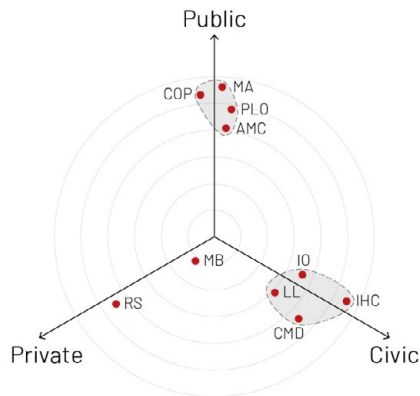
Acronyms for the governance diagram: AMC - Metropolitan Area of Cucuta / CMD - Minuto de Dios Corporation / COP - Copronor. Environmental Agency / IHC - International Housing Cooperatives / IO - International Organizations like GIZ and UNHCR / LL - Local Leaders / MA - Mayor of Cucuta / MB - Micro-businesses / PLO - Planning Office of Cucuta / RS - Retail Shops

FIG. 11.9 Systems of the CLT in San Diego according to the model in Puerto Rico.



FIG. 11.10 (Above) 3D for San Diego following the model of Housing Cooperatives in Uruguay.

FIG. 11.11 (Below) Governance diagram showing the interest of stakeholders involved in the development of the housing cooperative.

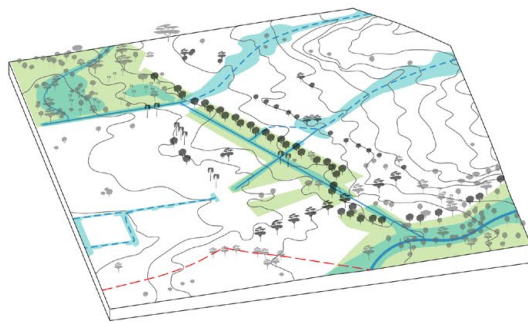


### Housing Cooperative following the model in Uruguay (FUCVAM)

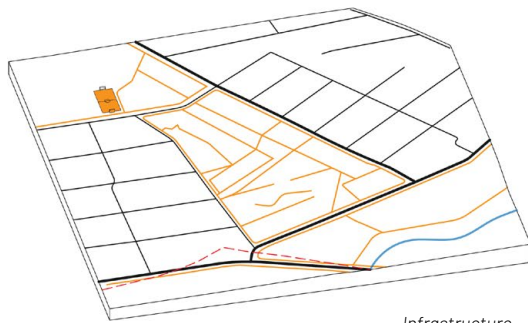
#### Collective Land + Collective Housing

As the cooperative housing model has never been implemented in Colombia, it is necessary to build a pilot project using the knowledge of international institutions. FUCVAM in Uruguay, has done a successful transfer of this model in different parts of Latin America by adapting the design principles to the legal framework of other countries. This proposal envisions a housing cooperative in the settlement of San Diego (VIS). Not far from El Rodeo there are already 3 of these gated communities for low-income families, living in small apartments and paying for long-term mortgages in order to live in private-owned housing. As a result, the cooperative model implies a change in this cultural paradigm of Colombia.

So far, the model has only been implemented in vacant lots for new housing projects. As San Diego is a settlement with a very low occupation, it is possible to think of a complete urban transformation. This scenario envisions a linear park as proposed in the first and second strategy for El Rodeo, to strengthen the biophysical connectivity of the territory and alleviate the flooding risk. Hence the importance of a higher densification with multiple typologies of housing and extra space for retail shops.



Landscape



Infrastructure



Occupation



FIG. 11.12 Systems of the CLT in San Diego according to the model in Uruguay.

To make this happen, it is important to bring together the appropriate stakeholders to a new arena (Albrechts, 2001). From the public sector, all entities can show a great interest as this is a 'formal' project, in other words that follows the rules of construction. Copronor, the environmental agency in Cucuta and the region would also have a strong vow promoting green oriented initiatives while the AMC would coordinate the intervention of public space produced by the cooperative. Regarding the private sector, cooperative projects are out of the market. However they still have a strong projection for the development of the city as they accommodate new housing units to a low cost, thanks to the participation of its inhabitants in the building process. Furthermore, the cooperative can rent part of the ground floors to retail shops and invest the money in the maintenance of buildings and other collective spaces.

On the civic sector, the CMD can participate in different ways. First, they can combine its social skills in community development, which is of paramount importance in the consolidation of the cooperative, especially in areas like El Rodeo with a high concentration of migrants from Catatumbo and Venezuela. Second, as the landowner of El Rodeo, El Minuto de Dios is highly interested in the legalisation of these neighbourhoods and the cooperative is a good way to involve the residents in the process. Third, they can bring together other civic institutions for fund raising and knowledge sharing, such as UNHCR, GIZ, and We Effect. The latter has the technical know-how to transfer cooperative models from Uruguay into other contexts.

In terms of landscape, during rainy seasons, the linear park would become into a buffer zone for water retention and temporal activities to complement the network of local facilities. The Park would also include a set of ditches and bioswales, however they can only work properly if they have continuity upstream and downstream.

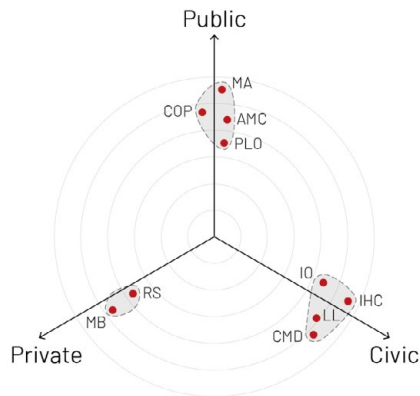
One of the best practices of housing cooperatives is the technical assistance by private companies to train residents for the construction of their own dwellings. This guarantees the stability of the buildings and the coordination of the project, including landscaping and subsurface infrastructure.

In terms of occupation, this model enables to allocate more housing than in the surrounding context. It also has more open spaces and a gradual transition between private, shared and public spaces. Another advantage is the different typologies, from apartments to terraced houses, which can allocate multiple sizes of families. Commercial activities and businesses can take place on the front roads while local facilities may happen towards the interior of the superblock, close to the more pleasant and quiet areas. This includes low impact activities such as playrooms, creches, 'salones comunales', pitches or even cafés. The income obtained from renting shops can also be reinvested in the management of common areas.



FIG. 11.13 (Above) 3D for San Diego following a mixed model between Puerto Rico and Uruguay.

FIG. 11.14 (Below) Governance diagram showing the interest of stakeholders involved in the process of development of the CLT.

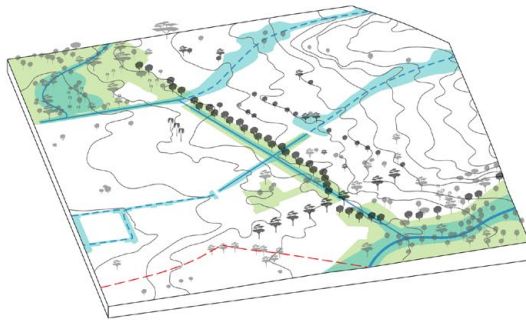


### CLT - Mixed model

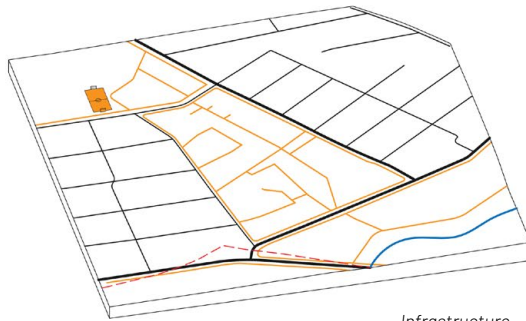
#### Collective Land + Mixed tenure of housing

Is it possible to think about a new model for El Rodeo? The interesting part of collective initiatives is that there is not a unique way of doing things. The models of Puerto Rico and Uruguay are quite different as they belong to opposite contexts, and both have things to contribute to El Rodeo. The first one is easier to apply to an informal settlement in phase of legalisation, while the second is better to envision the territory in the future. Therefore, a mixed model can be more open to the existing conditions and a broader picture of housing tenure according to the needs of its residents. The CLT would have a collective ownership of the land, with space for private and cooperative housing.

In this scheme, private, public and civic sectors could show more interest and therefore build an easier consensus, from major stakeholders to local community actors. The private sector involves the formal and informal economy, from micro-businesses in private houses to retail shops on the front roads. The construction of dwellings would depend on the housing cooperative and individual residents but never by private developers. The public sector would be active as in the previous model, in particular the planning office as they need to approve the legalisation of the CLT grounds, the title deeds for the individual housing units and all the building permits. El Minuto de Dios would keep an important role in the coordination of stakeholders and technical support from designers and related disciplines.



Landscape



Infrastructure



Occupation

- |                       |                |
|-----------------------|----------------|
| Context               | El Rodeo limit |
| Flooding areas        | Water bodies   |
| Green areas           | Existing trees |
| Commerce / production | New trees      |
| Facilities            |                |
| Leisure               |                |
| Main streets          |                |
| Secondary streets     |                |
| Pedestrian paths      |                |

FIG. 11.15 Systems of the CLT in San Diego according to the mixed model.

As this model involves a project plan, it would also be able to meet the landscape strategies, being the linear park the backbone of the CLT.

Moreover, the sewage system built for the housing cooperatives can also receive the water discharges from the existing housing. The network of public space would be enriched by the overlapping of pedestrian paths and elevated terraces between different levels of intimacy.

Eight islands or groups of buildings would configure the morphology of the superblock, defining front and back, exterior and interior. However, one of the limitations could be the low integration between individual and collective housing, especially on the same island. But it is important to bear in mind that these typologies are not strictly related to the housing tenure. There can be private apartments or collective housing with individual gardens, all mixed in the same CLT.

### Some conclusions

As explored in the previous models, the CLT can appear in different ways. There are no bad or good models, just multiple solutions. Creating a pilot project of a Community Land Trust in San Diego, can become a trigger to solve the legal and environmental problems of informal settlements in El Rodeo and the rest of the city.

CLTs in informal settlements can avoid eviction, reduce real estate speculation and the commodification of housing. Unfortunately the housing framework in Colombia only considers private ownership and private rent, in both formal and informal dwellings. It might be difficult but not impossible to change this paradigm in housing tenure.

For this reason it is necessary to implement new policies to support cooperatives and do-it-yourself initiatives. For instance, to access low-interest rates from the government to buy land or build up new housing cooperatives as it happens in Uruguay (Delz, Hehl, & Ventura, 2020). The case of El Rodeo is unique, as the CMD is the landowner and they wish to help people to improve their living conditions, but in other context the community needs to pay high cost for the acquisition of land for development.

CLTs promote active participation of its residents, which means they are involved in everyday decision-making. These communities usually have strong social ties that is transmitted between generations.

A CLT can have private spaces, semiprivate and collective spaces. For instance, individual gardens are for private use but collectively owned. One thing is ownership and another is appropriation of space.

One of the main differences between the two models is the possibility to modify the buildings and open spaces. In the Uruguayan model it is





FIG. 11.16 Perspective of the linear park at San Diego's CLT (Mixed model). On the right a girl crossing the path over the shallow bioswale. This system helps to infiltrate water into the soil during rainy seasons and modifies the landscape of the linear park creating a different atmosphere. Developed by the author. Furthermore, the mixed typologies of housing enable to transform the interior of the block into a new front that facilitates social and ecological processes.

The image of the place can help the community to envision El Rodeo in the future.

FIG. 11.17 (Next page). Matrix for the three models of CLT, showing their relationship to the strategies for El Rodeo, diagram of stakeholders, poldering and the necessary institutional transformation to achieve them. Developed by the author.

difficult to transform the houses as decisions are taken collectively. Instead, the model of Puerto Rico is based on an informal economy which has direct implications on the built environment.

Another limitation of the Uruguayan model is that it is always implemented in vacant lots where it is easier to plan and build the project. Consequently, if the project is not implemented promptly in San Diego, people will take over the land as in other areas of El Rodeo. Unfortunately, some of these vacant lots are under risk of flooding or are located in steep slopes, thus can only be used as urban orchards.

On the other hand, the model of Puerto Rico might be more flexible than the one in Uruguay, but decision-making involves large quantity of actors, making the process slower. As a consequence, short-term planning prevails over long-term projections for the territory.

### Steps to establish a CLT in El Rodeo

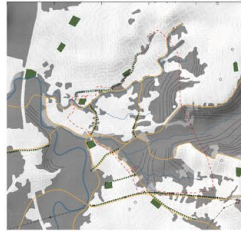
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1. Receive training from international cooperatives and CLTs. The CMD is the landowner and has a legal department that can establish a new cooperative between neighbours. They also have contact with different stakeholders that can help to fund the project. Nevertheless, they have little knowledge about collective initiatives.
2. The CMD also needs to engage the population in the project by showing them the benefits in the long term. This is not about informing the community; participation is essential in every step of the process.
3. Once the community decides to implement the CLT, they need legal advice to constitute themselves as a legal entity. In the case of El Rodeo, the CMD is very interested in cooperation.
4. The CMD transfers the land to the new CLT in title deeds. They can arrange if it is a donation or leasing. This leasing or 'concession of use' is usually considered for a 99-year term with a possibility of extension. However, the current strategy from the CMD is of purchase and sale, as residents have to pay a low cost for the land.
5. Up to this point, the CLT is constituted in the same way as in Puerto Rico. The community has the right to use the land in a legal form. Then, the CLT needs to settle the limits between public and collective. This action facilitates the construction of public works on the areas established as public. This step involves an urban designer that coordinates the plans with the planning office of Cucuta.
6. The community has now two options: follow the model of Puerto Rico or the model of Uruguay. The first one means doing a separation between land and housing ownership. The land remains part of the CLT, while its residents individually own the buildings. The second path is most likely in areas for new development, where both land and buildings are part of the cooperative. 'It should be noted that every community is different and, therefore, every CLT will also be different' (Algoed, Torrales & Ribeiro, 2020).

STRATEGIES

MODELS

Green Network



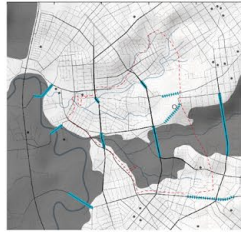
Water Management



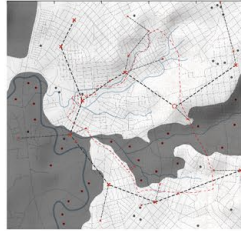
Street Network



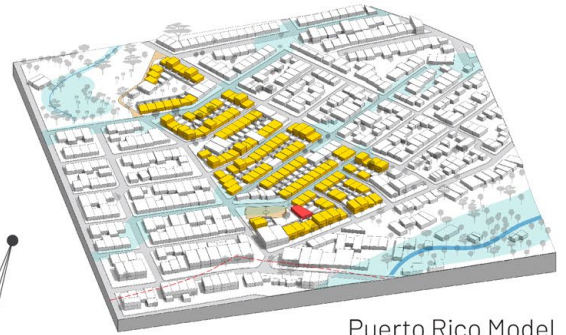
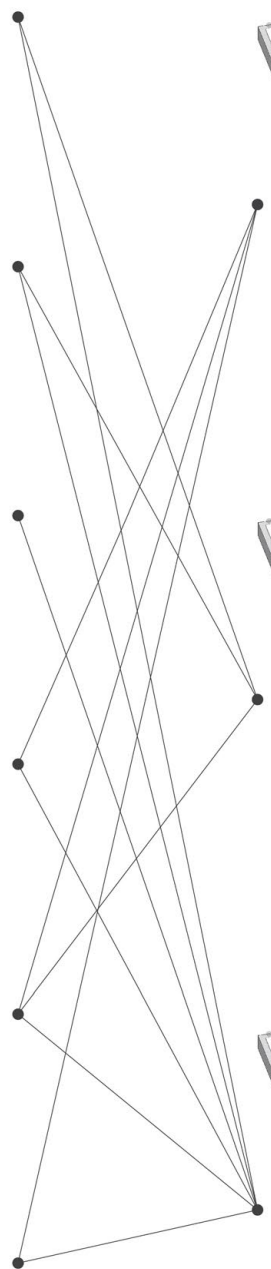
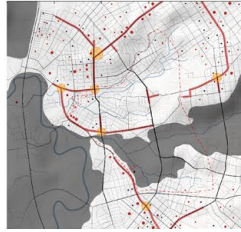
Bridges & Stairways



Facilities



Micro-businesses



Puerto Rico Model

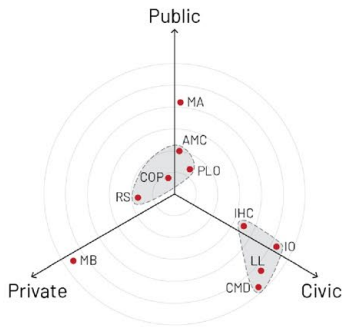


Uruguay Model



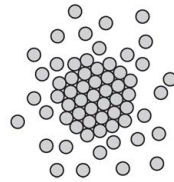
Mixed Model

## STAKEHOLDERS



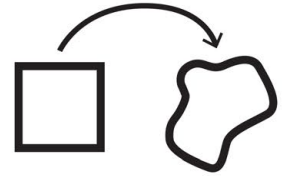
Civic intervention  
Public dependency

## POLDERING

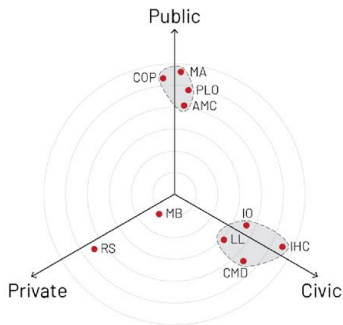


Large quantity of actors  
slow speed process

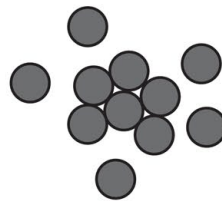
## INSTITUTIONAL TRANSFORMATION



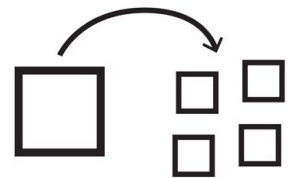
Adapt to informal thinking



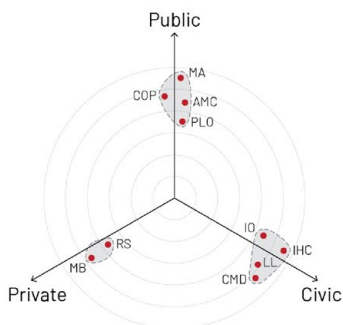
Public-civic intervention



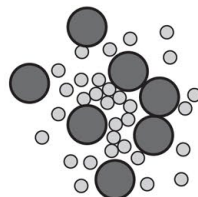
Small quantity of actors  
fast speed process



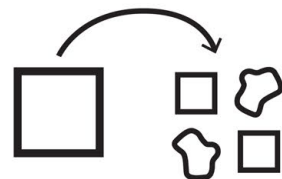
Decentralize and  
empower citizens



Public - Private - Civic Intervention



Medium quantity of actors  
medium speed process



Multiple Solutions



FIG. 11.18 Network of local facilities in El Rodeo and accessibility proposal. This drawing shows the most representative elements of the street network proposed for El Rodeo. It is an extrapolation of reality at different scales, trying to show the impact these elements on integrating the city's edge with the surrounding landscape. Developed by the author.

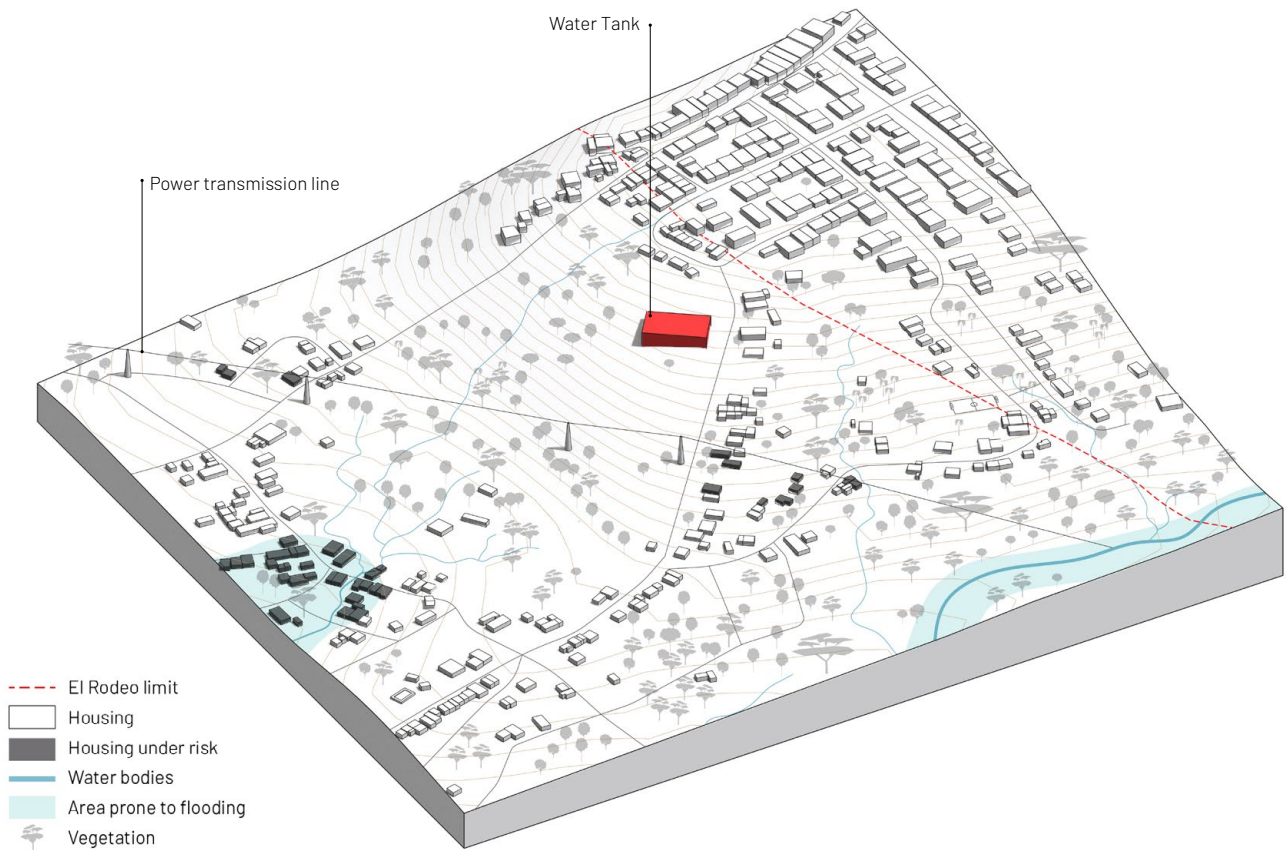


FIG. 11.19 3D showing the current situation of the water tank and its context.

The water tank of El Rodeo is an old structure that provides potable water to the west part of Cucuta. Initially, the tank was built in a rural area and now is part of district nine. Due to its strategic location, it would be possible to transform the tank into a water park with additional functions for the surrounding communities and attract visitors. This project can be part of the network of Corazones de Barrio, providing a space for education and recreation for different ages. The new facility would become a trigger of new projects in El Rodeo and boost the economy of micro-businesses in the area.

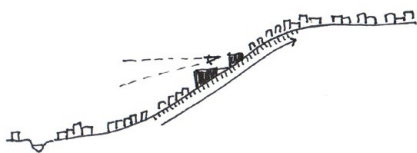


FIG. 11.20 Drawing section of the water tank and its relationship with the context.

As the urban fabric consolidates, the old paths also become part of the street network. The way that connects the tank with El Rodeo (lower part) and with 'Barrio Doña Nidia' in the upper part of the valley has become relevant for the local integration. The slope is between 16 and 32 per cent, which means it is not suitable for vehicles. So, alternative solutions like the funicular tramway in Lisbon can happen next to the construction of a stairway to develop this new front.

According to the POT risk map, this area is not classified as high-risk of landslides. However, flooding is a permanent threat in the lower part of the valley. In addition, an electric power transmission line becomes another problem as an informal occupation appears below. In the hypothetical case that a collective housing project establishes in the surrounding plots, it would be possible to relocate the affected families and incorporate these areas into the park.

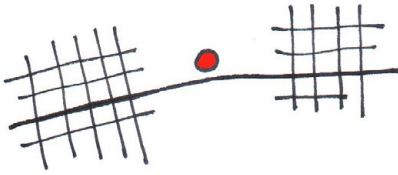


FIG. 11.21 Sketch of the urban fabric next to the water tank in 2020.

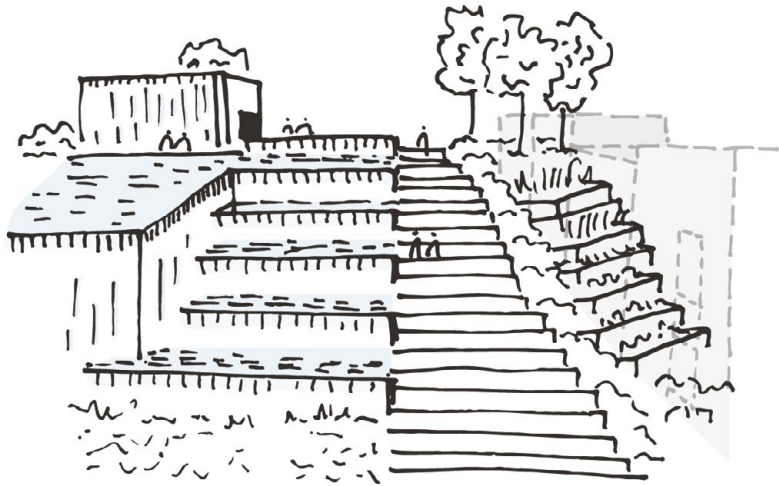


FIG. 11.25 Concept of the water stairway at the new facility.

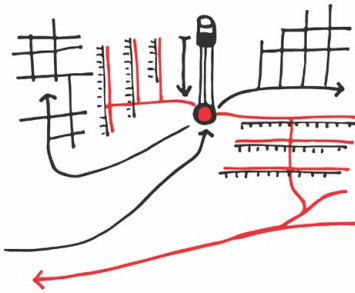


FIG. 11.22 Sketch of water flows: Water supply (black) and rainwater management (red). The topography could be used to build terraces for urban agriculture and irrigation systems.

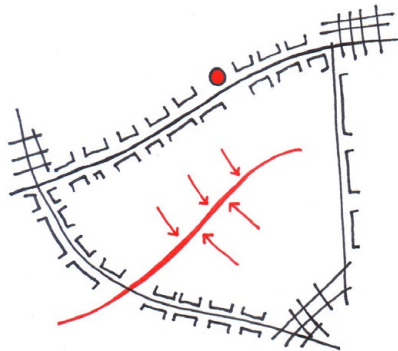


FIG. 11.23 Sketch of the Back and Front concept applied on the block next to the water tank.

All drawings were developed by the author.



⋯ Wild Vegetation

xx Agriculture

FIG. 11.24 Drawing of the water tank and the surrounding landscape proposed. Fast flows like the funicular tramway, happen on the front road, while the slow flows appear in the back.

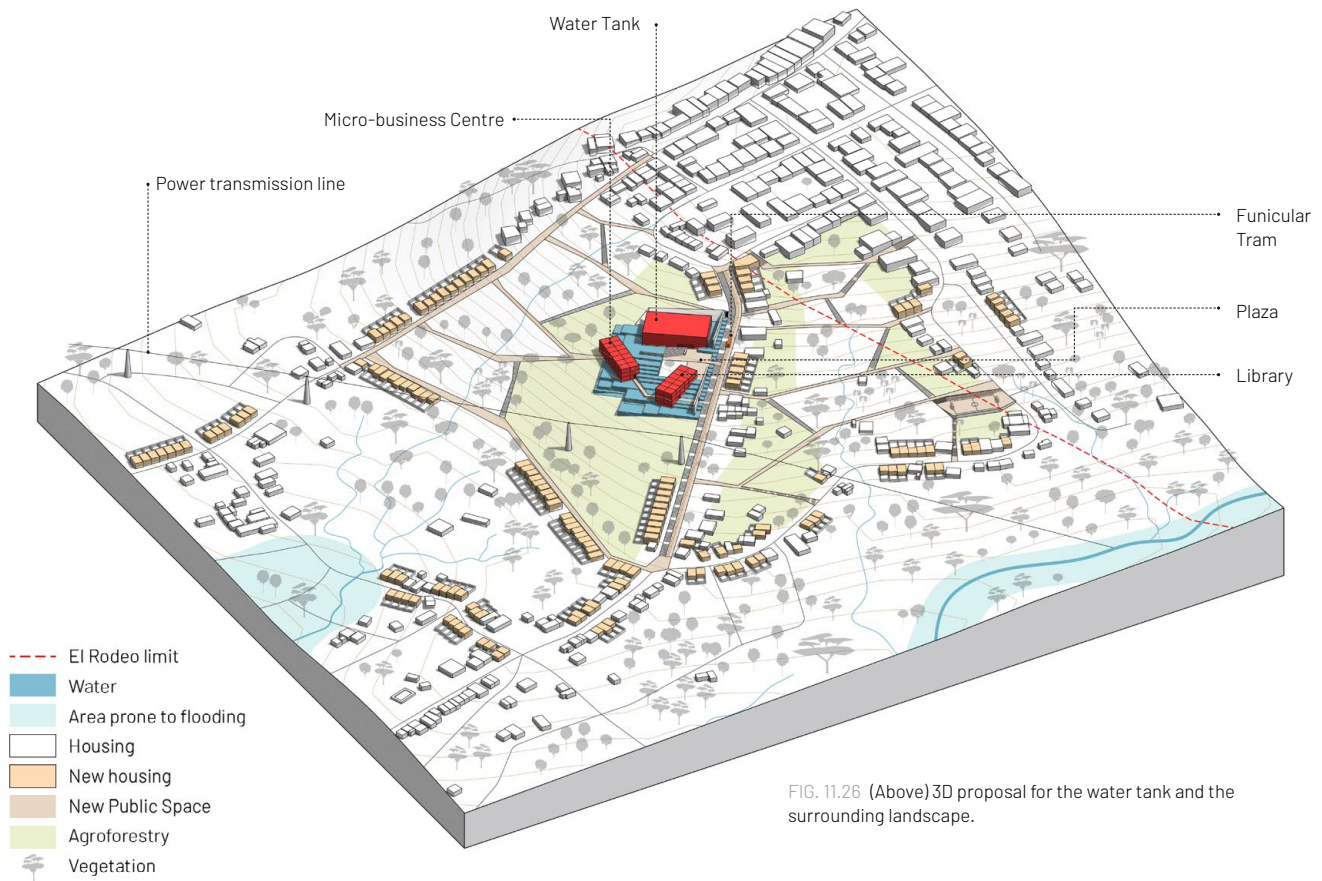
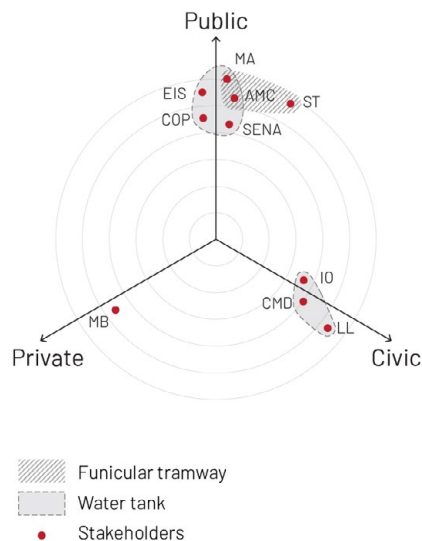


FIG. 11.26 (Above) 3D proposal for the water tank and the surrounding landscape.

FIG. 11.27 (Below) Governance diagram showing the interest of stakeholders involved in the process of development of the water tank facility.

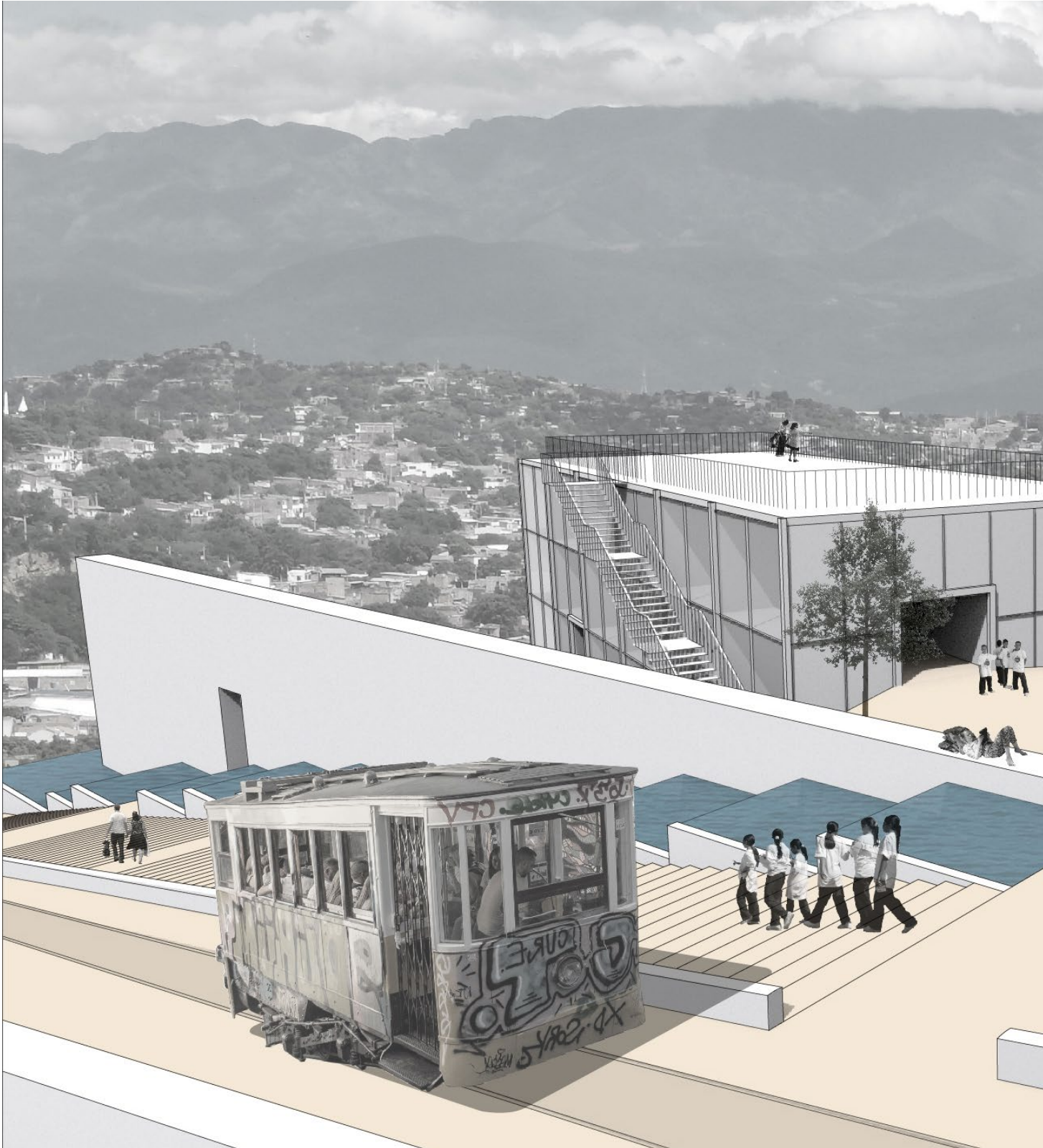


The proposal for the new facility has three buildings. The first one is the renovation of the tank; the second is a public library with workshops to promote reading and digital tools; the third one is a centre for the micro-business sector. The latter is a building with classrooms and workshops for training entrepreneurs in technical skills and management tools.

The idea is to integrate the buildings into the surrounding landscape through public space and water terraces. The water stairway and a wall embedded in the topography set the border between in and out, enabling the park to be open. This transition between back and front configures the urban depth of the new blocks. The front road is where human activities and public life occur, with commerce, transport and housing. The back is quieter, domestic and is related to the water runoffs, 'facilitating ecosystem service flows' (Egerer et al. 2020). The construction of terraces in the back helps to contain the terrain, creates space for agroforestry, generates jobs and avoids informal growth on green corridors. Residents may also extend agricultural practices out of their backyards, having more space for breeding goats and chickens.

Acronyms for the governance diagram: AMC - Metropolitan Area of Cucuta / CMD - Minuto de Dios Corporation / COP - Copronor. Environmental Agency / EIS - Cucuta's Water Supply Company / IO - International Organizations like USAID / LL - Local Leaders / MA - Mayor of Cucuta / MB - Micro-businesses / SENA - National Learning Service / ST - Secretary of Transport







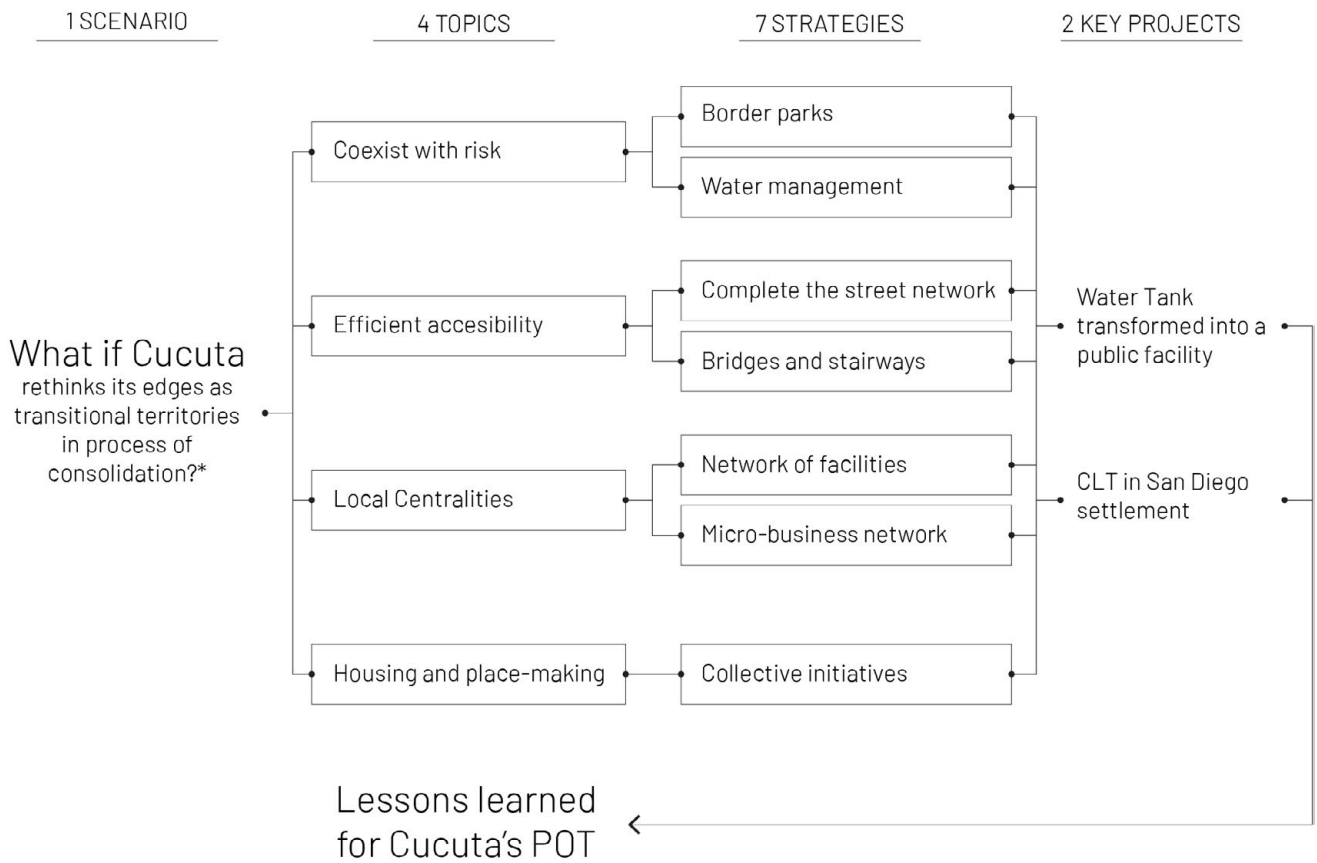


FIG. 11.28 Now the research-by-design approach gives feedback to the larger scale and recommendations for Cucuta's POT.

FIG. 11.29 (Previous page) Perspective of the new facility proposed for the water tank in El Rodeo. Developed by the author.

# 12 – Conclusions and Recommendations

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This chapter responds to some of the research sub-questions (RSQ) of this paper. Some others were inquiry tools to guide this research, which means they are not included in these conclusions to avoid repetitive information.

The first part is related to the RSQ-3, trying to give feedback from the scenarios to the POT. The second part comprises a set of recommendations for the municipality of Cucuta to create a local planning framework (RSQ-7). The third part reflects on the border and the lessons learned from other border cities (RSQ-1 and RSQ-5).

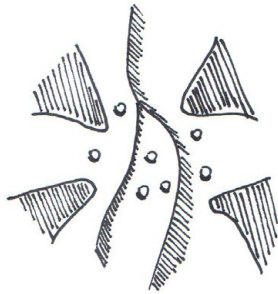
## 12.1 – Feedback from the scenarios to the larger scale

This section is related to the research sub-question (3).

In chapter four, we discussed the POT strategies to consolidate the edges of the city. Now it is time to give feedback to the POT from the scenario exploration by topics.

### Coexist with risk

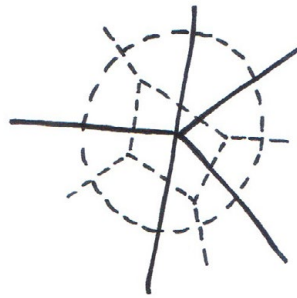
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*Border parks and water reservoirs*

The Metropolitan Area of Cucuta has enough land suitable to allocate new housing at a low cost. Unfortunately, the policies to consolidate neighbourhoods on the city's edges are focused on land regularisation and the completion of urban networks. Instead, the municipality could anticipate the occupation of high-risk areas by promoting 'do it yourself' initiatives in areas free of risk. At the same time, high-risk areas could be transformed into border parks, not as natural reserve areas prone to illegal occupation but as metropolitan facilities that facilitate ecological connectivity and spaces for recreation.

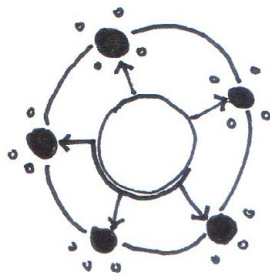
Creating water reservoirs is another landscape strategy to mitigate flood risk and water shortages. Likewise, the implementation of Water parks on a lower scale can improve water retention and prevent the occupation of high-risk areas. Therefore it is necessary to 'redefine the wet and dry interface' (Rojas, De Meulder & Shannon, 2015), understanding the permeability of the surface and 'manipulating the topography to achieve different levels of protection'.



Infrastructural links

## Accessibility

The current administration already has a plan to improve mobility in Cucuta, but it can always improve. First, the proposal for public transport has a star-shaped pattern in which all the routes pass through the city centre. Despite having a ring road that could connect all the edges through a loop, it is not included in the proposal. Second, the cycleways network is considered a recreational asset and not an alternative solution<sup>1</sup> to reduce traffic jams. Introducing bicycle parkings close to BRT stations is another option that has never been implemented in Colombia and could underpin the transportation project. Third, the municipality could use space syntax to foresee the consolidation of the urban tissue and complete the missing links in the street network. The example of the funicular tramway in Lisbon can influence similar projects in streets with a steep slope and a high connectivity potential.

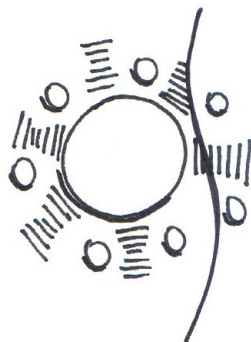


Retrofit local centralities

## Local centralities

The national government is investing resources in promoting the micro-business network to reactivate the economy. Improving productivity chains at the micro-scale level is a key action to decentralise the dependency on the city centre and ensure livelihood for the most vulnerable groups. This action should work in parallel to the consolidation of local facilities, which represent the places of encounter for children and the elderly. In this way, the network of local centralities is paramount to transform the Metropolitan Area of Cucuta into a polycentric region.

Considering the poor coordination between administration periods, the AMC is trying to design and build as many projects as possible to improve living conditions in the city's edges. However, these projects can be counterproductive if there is no cooperation with local communities and civic society for the daily use and maintenance of these spaces.



Transitional territories for place-making

## Housing and place-making

In a region where informality prevails, it becomes utopian to work with policies that only embrace formality and stigmatise people who have lived on the edge of society for decades. As mentioned before, these transitional territories between rural and urban should follow special regulations and receive technical assistance to improve their living conditions.

Collective initiatives also engage community planning with an empiric knowledge of the territory, which planning institutions usually lack. The implementation of CLTs in informal settlements can avoid eviction, real estate speculation and keep the values of the community. In a city like Cúcuta, where some Venezuelan migrants yearn to

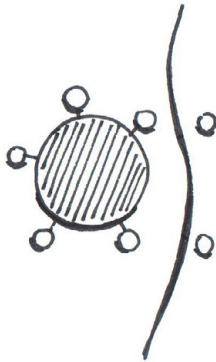
FIG. 12.1 Design principles for Cucuta. Drawings by the author.

<sup>1</sup> Due to topographic conditions and the warm weather, people in Cucuta are not motivated to ride a bicycle. However, short-distance commuting is still possible in a great part of the city.

return to their country one day, place-making becomes essential to create more permanence and identity.

However, it is challenging to transform CLTs over time. On the one hand, it relies on public intervention for the construction of infrastructure. On the other hand, the land is out of the market, which constraints the participation of the private sector and future re-densification.

The proposal for a CLT in El Rodeo could also apply to big parcels owned by the municipality to ensure the occupation of areas suitable for development, and at the same time, reduce the commodification of housing. Nevertheless, it is important to remember that the city centre has a very low density of dwellings and a high concentration of activities. This means that there is still enough space to densify Cucuta before thinking of urban expansion. To exemplify, FUCVAM has already built housing cooperatives in areas of urban regeneration in Uruguay.



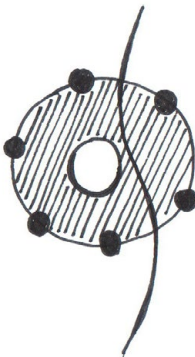
*From city planning*

Furthermore, it is necessary to change the negative connotation of informality. One option is by using other concepts like spontaneous. An advantage of the spontaneous city is that residents transform it every day, creating a solid sense of place-making and adapting to the social dynamics of the border. Undoubtedly there are issues and consequences of a short planning and a little understanding of the conditions of the territory, but there are still positive outcomes when the city is developed by the people.

#### **Other conclusions for the POT:**

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If the city continues with the same pattern of urban growth, it will be more centralised, fragmented and with two different types of edges. On the one side, the marginal population has no means to live in the city, and on the other, medium and high-class families who want to live in the suburbs. However, this is not a forecast; it is a reality that already exists and sharpens over time. The advantage of second-tier cities like Cucuta is that they have a more malleable scale and less bureaucracy than megacities to rethink spatial planning and put plans into action.



*Into Transboundary Planning*

Cucuta is also the largest border city in Colombia, and there is no transboundary planning. The POT includes in the analysis of the territory the social and economic aspects related to the border. Nonetheless, the environmental conditions are barely mentioned or mapped in the Plan. When they propose strategies for water management or the tropical dry forest, they only consider the land in Colombia, which makes it difficult to make decisions regarding common elements of the landscape.

However, this sounds utopic in the current relationship between Colombia and Venezuela. Furthermore, the POT needs to re-evaluate the challenges that guide their Plan, considering the migration from Venezuela and its implications in the urban growth of the city and its edges. In areas like El Rodeo, some residents are Venezuelan migrants who expect to return to their country one day, augmenting the sense of temporary urbanism already latent in informal contexts.

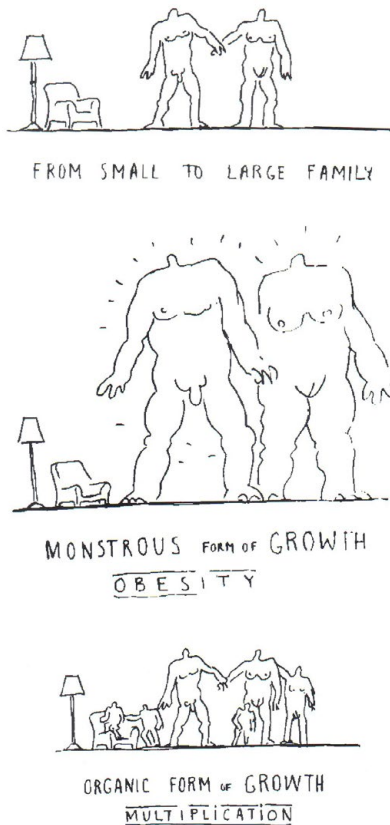


FIG. 12.2 'Just like a family of individuals, a city can grow only by reproduction and multiplication, that is by becoming polycentric and polynuclear' (Leon Krier, 2009) in *The Architecture of Community*.

## 12.2 – Recommendations for a New Framework

This section is related to the research sub-question (7).

Is it possible to plan from the local level to respond to large scale issues? Is it possible to create an instrument of planning from the lower scale in informal contexts?

The city needs to implement a Special Plan to consolidate and integrate its edges, with special regulations for informal settlements different from those that apply to the formal city. In this way, it would be possible to achieve an inclusive urban development in the edges of Cucuta with strategies and actions that respond to specific locations. To make this happen, a new planning framework is imperative, articulating the POT with local plans. These are some recommendations:

- The new framework involves a transformation of the public institutions. The Planning Office needs to do more than just approving spatial projects; it needs to be more proactive. Working hand in hand with the AMC and the Urban-Think Tank (Centro de Pensamiento Urbano), they create local plans for each of Cucuta's districts. The same should happen with the planning offices of the five surrounding municipalities. Also, academic institutions and private offices with interdisciplinary teams could help transform the POT into a more decentralised planning instrument.

- But this local planning needs more than high-skilled professionals and designers, it also requires a sense of place-making. To do so, the Mayor's Office should involve civic organisations like El Minuto de Dios, which has no experience in spatial planning but has a strong network of stakeholders to work in community development programmes. This alliance can put the Planning Office in direct contact with residents of each district and create arenas for a participatory process.

- The POT needs urgent coordination between technical analyses and design. The current Plan is divided into diagnosis and formulation. However, there is a lack of integration between the two parts. The first one is an extensive inventory of the social and physical conditions of Cucuta and the region. For instance, there is a strong subsoil analysis, but it is not considered in the formulation part. The city's development model is mostly based on economic issues.

- The policies to upgrade informal settlements should not be the only way of improving the edges of Cucuta. They provide strategies to fix an existing problem to a high cost. Instead, the formulation of new policies should promote 'Do-it-yourself' initiatives. For this purpose, the municipality needs to reduce bureaucratic processes and expenses to engage people.

- Make the Plan readable. The POT is a set of documents with information that repeats from one to another. It is necessary to avoid overlaps and use visual tools to make it clear. Spatial planning is not only about designing policies for private developers to come and take decisions on the city. The municipality should explore maps and images as powerful design and representation tools, becoming a challenge to set clear actions for the short and long term.

However, there is a related case in Cucuta that caused misunderstandings. Some years ago, Cucuta's Chamber of Commerce commissioned a group of architects to envision the Metropolitan Area with long-term and ambitious projects. The strategy was called Cucuta 2050, and despite the fact of receiving strong critics, it also set a base to rethink the future of Cucuta. In 2020 Jairo Yañez, the Mayor of Cucuta, used the same name as the slogan for his campaign, creating confusion and false expectations. Overall, positively using visual resources can help to inform citizens and engage future administrations to continue with the projects.

- Even if the current POT is outdated, local plans could respond to specific issues at a lower scale. For the moment, the only instrument approved by the municipality is the 'Partial Plan'. These are key projects designed by architects following regulations of land use, density, minimum distances to water bodies and other principles that have no consideration for landscape conditions. Instead, local plans have the potential to adapt visions and strategies into key projects for the lower scale.

### **What is missing to achieve a comprehensive plan for El Rodeo?**

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At the beginning of this graduation project, the aim was to create a strategic plan with a local vision for El Rodeo. But during the analysis and design process it became clear that to create a vision for an area that has been developing spontaneously for more than 30 years, it would be inadequate and have no contribution for El Rodeo. Instead, a local plan needs to be constructed through a process of participation that includes local leaders, as representatives from the more than 12 communities or settlements that compose El Rodeo.

As the municipality has no means to deal with such a long process that happens all around the city, it needs to work hand in hand with civic organizations and include other public institutions in the formulation of local plans and the review of the Structural Plan of the city.

This research-by-design only includes spatial strategies for El Rodeo. However, to develop a local plan it is also necessary to do a detailed analysis of the social aspects and design policies to improve the well-being of communities in other matters. For instance, socio-ethnic segregation is one of the main issues in El Rodeo, promoted by public officials and community leaders.

Flooding might be the most latent issue in the area but building retention walls and canalising creeks for water defence are only short-term actions that involve a high cost for the municipality. The scenario exploration helped to visualize a variety of solutions to deal with this and other key issues. The same happened with security in land tenure. It is not sufficient to legalize settlements and provide title deeds to people. The municipality needs to design policies to promote collective initiatives and place-making, which enable individuals and communities to shape their living environment.' (Andres et al., 2021)



### 12.3 – About border cities

This section is related the research sub-questions (1 and 5).

#### **What does it mean to live on the border? What can Cucuta learn from other border cities?**

We have analysed limits at multiple scales, from the national border to the city's edges, where urban and rural meet. In both cases, we found visible and invisible barriers, physical and social ones. In the case of Cucuta, the physical limits are marked by irregular topography, water bodies, eroded land, unpaved roads, the lack of drainage systems. At the same time, inequality of opportunities is the most latent border for both citizens and migrants.

Like other border cities, Cucuta is highly dependent on transboundary commerce. In the case of Ciudad del Este, the economy relies on the exportation of agriculture while Ciudad Juarez has already developed a solid industry promoted by American companies. Instead, Cucuta and Norte de Santander's region are rooted in the extraction of natural resources and drug trafficking, hindering their development.

Is it possible to transform the condition of Cucuta from a transitory city into a hub of opportunities?

Cucuta needs an urgent shift in the economic driver of the region. As explained in the case of Ciudad Juarez, the industry would allow the city to be more self-sufficient and adapt to the border fluctuations. This would also help to reduce informality on a larger scale. Investing in infrastructure can also be an opportunity to create new jobs and attract industries to the region. However, it is necessary to use the potential of existing micro-businesses and small industries, like the well-known shoe manufacturing of Santander. Empowering entrepreneurship goes against traditional monopolies and adapts better to the informal conditions of low-income families in Cucuta.

The Temporary Statute for the Protection of Migrants (ETPM) and the strategy to support the micro-business network are two crucial steps to face the country's current situation. However, in the case of Venezuelans, they need more than regularisation of their status. The same happens with the inhabitants of informal settlements, who need more than legalisation and regularisation of their properties. As exposed in the strategies for El Rodeo, collective initiatives are one of the possible solutions to achieve an inclusive urban development in the edges of Cucuta. All these actions imply the design of new policies in different matters.

Finally, Cucuta's planning framework should move towards a decentralisation of the POT into local plans and scale up into transboundary planning. In a hypothetical scenario in which the Venezuelan crisis is over, or at least some agreements are reached between countries, the AMC should include the towns of San Antonio and Ureña in the planning strategies for the Metropolitan Area.

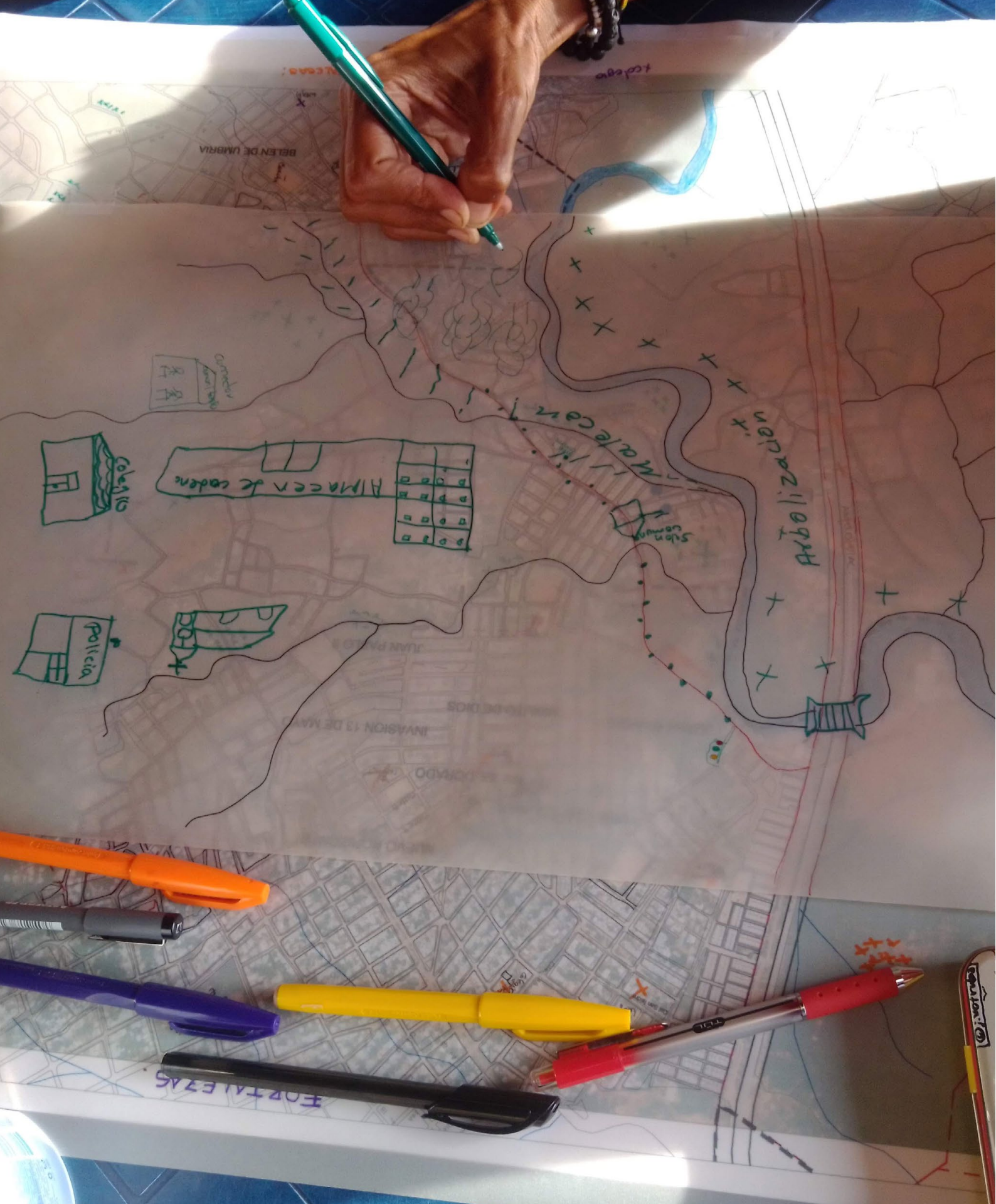
PART 4

## Closing

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Reflection and appendices

**'While self-organized initiatives have a strong capacity to create social ties, municipalities have the experience and power necessary to implement spatial changes. It could be mutually beneficial to promote more cooperation between the public authorities and self-organized initiatives.'** *Igor Pessoa (2021)*



BELEN DE UBRIVA

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Almacén de cadenas

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## 13 – Reflection

As explained at the beginning of this paper, the initial framework of this research was based on previous courses of the EMU programme. However, during the process between the analysis and design, it became difficult to follow this structure. Probably the reason is in the informal nature of Cucuta, really different from the reality of the contexts explored during the course. But this is not a shortcoming of the master, where teachers are constantly encouraging students to create their own method of research according to their personal concerns and the conditions of the area of study. Also, this is not the case for all architectural faculties, where students must follow a particular method imposed by teachers or transferring successful models from different places.

In every context, we have traditional ways of doing things that become part of our culture and that sometimes are not the best option. In particular, referring to the way we design and build our cities in the 'Global South', most of the time taking European and American planning for granted and usually based on laws and regulations. The case of El Rodeo represents the gap between how its inhabitants build the spontaneous city while the formal city is developed by private investors and local governments, denying the needs and economic capacity of a representative amount of the population.

The initial outcome of this research was to produce a strategic plan for El Rodeo, creating a vision of the future for an informal context. This could have been achieved, but through the research, it became evident it was not the best product for this particular context, where the landscape is modified every day by its users. As Felipe Vera argued in an interview held by Dostercios in 2017, 'we are always trying to solve things and classify them, but sometimes that is not possible' (Vera, 2017), especially in a context of constant fluctuation as Cucuta and its edges. Instead, a set of recommendations and the image of the place are still an open possibility for further interpretations.

Even if the topic on informal settlements is not part of the research fields of the European Post-master in Urbanism, border cities and physical barriers were studied as forms of social segregation in cities. At the beginning of the graduation project, the research was not intended to be focused on these virtual boundaries, but in the end, it took an important role in the analysis and how to blur these limits through design. Moreover, the multi-scalar approach used in the master was an excellent resource to analyse how global challenges affect local populations, and, in some way, it was possible to grasp the inter-disciplinarity of urbanism by working in collaboration with El Minuto de Dios. Nevertheless, it would be better to have the possibility to do projects among students from different faculties to put into practice this method. This would help students to focus on their research field instead of trying to synthesise the complexity of a city, which is usually done by a group of professionals of different fields.

The methodology used to develop the scenarios was based on the IUAV approach, which is different from the traditional method of two axes. Each scenario intends to address a particular challenge of the territory by exploring possible responses

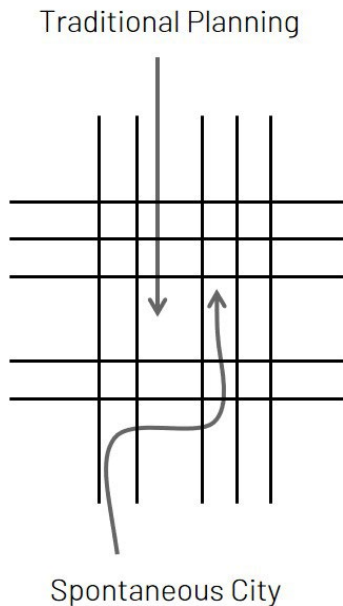


FIG. 13.1 Diagram of Traditional Planning vs. Spontaneous City in Colombia. Drawing by the author.

FIG. 13.2 (Previous page) Workshop with local leaders and neighbours. The participants were reflecting about their living environment and proposing strategies against flooding. Photo: Catalina Rodriguez

through What if questions. This enabled to design strategies according to the conditions of El Rodeo and respond to the problems that affect the urban growth of Cucuta and its Metropolitan Area. This means that there are no extreme choices leading to hypothetical scenarios, which can fall into misinterpretations. The reality that people live in El Rodeo is already extreme to make it worst. In this way, there are no radical decisions to be made, just an exploration of possible futures open to everyday variations.

In the same way, the investigation about collective initiatives and their application in El Rodeo showed that none of the models is better than the other. It depends on the needs of a specific community that wants to engage with this kind of project.

The scenarios were also a good tool to make the research more scientific in a context with a lack of data and deficient planning strategies. Scientific research in spatial planning is usually related to data-driven analyses and very little to qualitative methods, and even more now that we spend most of our time sitting behind screens. Unfortunately, due to covid-19 conditions, the fieldwork was short and with social distancing restrictions but was still useful to complete part of the information. Semi-structured interviews were also a crucial input for this work. However, it would have been more 'scientific' if more interviews and surveys had been conducted with the local population.

Another tool that is not mentioned in the report is the dialogue between mentors and student. The weekly discussions helped to give clarity and structure to the methodology of this investigation. Usually, these conversations ended up in more questions that opened the scope of the project and helped me get on track in other cases. Unfortunately, due to time limitations, it was not possible to follow all the suggestions. But the learning remains.

I strongly believe that the outcome of this research could help both El Minuto de Dios and the municipality of Cucuta to rethink the way of planning the unplanned or fixing what is already done. In Colombia, the word innovation is constantly used in public speeches but rarely applied to reality. It is not about creating something new and out of context. On the contrary, it is about re-framing our way of planning from the local scale and moving towards medium and long-term actions.

As in any project that involves design, the transferability of the project results is more related to the method than the spatial outcome. The strategies proposed for El Rodeo could be transferred into other areas of Cucuta, especially in expansion areas of the city that share similar conditions, as long as these are implemented as part of a local plan and a previous analysis of the local scale is performed. Nevertheless, these kinds of initiatives depend on the design of new policies with a better adaptability to the local conditions of informal contexts. This would enable a more flexible planning between the municipality, key stakeholders and local actors. In the same way, alternative planning methods are missing in other cities of Colombia and the Global South, as evidenced in the analysis of the case studies, where local planning is in the process of consolidation.

Both topics, border cities and alternative planning methods in informal contexts, have few examples in literature and could be explored in the future.

Finally, one of the greatest limitations of this graduation project is that the complexity of the territory needs innovative solutions that go beyond architecture and urbanism. Despite this, there is a profound reflection that needs to be addressed from the way of planning and the commodification of housing.

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Ciudad Juarez: The Architecture of Failure <https://www.smartcitiesdive.com/ex/sustainablecitiescollective/ciudad-ju-rez-between-resiliency-and-engage-ment/23014/?fbclid=IwAR2IVrWfkKeyEvxEDaxy6gVsNTwDnucnGnTvBHBj7jr18dTXn5KY2ATX5-0>

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Photos Cucuta: [https://www.cucutanuestra.com/temas/fotos\\_cucuta/1800/cucuta\\_1800.htm](https://www.cucutanuestra.com/temas/fotos_cucuta/1800/cucuta_1800.htm) (fotos historicas)

# 14 – Appendix

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## 14.1 – Meetings with stakeholders

Semi-structured interviews that aim to understand the main challenges on the regional scale and the main urgencies and opportunities of the local scale in El Rodeo. Furthermore, understanding the interests of the stakeholders and their commitment to the project of El Rodeo. These questions are a base to open discussions, also known in the literature as ‘semi-structured interviews’ (Hernandez-Garcia & Yunda, 2018).

### **Note: Confidentiality Statement**

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Start every survey, workshop, and meeting with an opening statement by explaining to the participants the purpose of the research and their time during the activity. Their participation is voluntary, which means they are in their right to omit any question or withdraw from the activity at any time. State that the answers in this study will remain confidential and for research purposes only. In case of recording, ask the participants about your intentions before doing so.

All Interviews use name abbreviations, for example F: Federico Bernal.

### **Base questions to Miguel Peñaranda (director of the AMC)**

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- What do you think are the main challenges of Cucuta today? Was it different ten years ago?
- From your point of view, which are the main urgencies and opportunities of El Rodeo?
- Are you from Cucuta? How was the area of El Rodeo some decades ago?
- How do you imagine the area of El Rodeo in the future?
- After legalizing the plots, what are the next steps for El Rodeo?
- Apart from the project with El Minuto de Dios, which other strategies are you planning for this area of the city?
- Which plans do you have in other peripheral areas of the city?
- Has the AMC or the mayor worked together with other institutions on similar projects?
- Do you consider the ring road an important element for the development of peripheral areas of the city?
- In past projects, how do you engage the communities in your projects?

## Base questions to the team of El Minuto de Dios

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- What do you think are the main challenges of Cucuta today? Was it different ten years ago?
- From your point of view, which are the main urgencies and opportunities of El Rodeo?
- Are you from Cucuta? How was the area of El Rodeo some decades ago?
- Who are the main stakeholders involved in El Rodeo?
- How do you imagine El Rodeo in the future?
- Which are the main stakeholders of El Rodeo project?
- After legalizing the plots, what are the next steps for El Rodeo?
- Which programmes of the university are involved with the community? Is it possible to contact the people in charge of them?
- Which initiatives have El Minuto de Dios in other areas of the city?

### 14.1.1 – Fabiola Garcia-Herreros (CMD)

#### **F: What do you think are the main challenges of Cucuta today? Was it different ten years ago?**

FGH: In my view, they are 4 challenges which are corruption, education, the sense of belonging and an innovative proposal for the new reality. Cucuta grew by looking at Venezuela; it didn't need Colombia. Indeed, Cucuta has always been above Colombia. They had the first railway and the business with Europe and Venezuela. It was the first agro-industrial department of Colombia with coffee and cocoa. Before Chavez, there was a real commercial exchange. Colombians went shopping in Venezuela because it was much cheaper (everything was subsidized). People didn't seek to study because there was a growing commercial business, a lot of abundances that prevented the Cucuteños from focusing on education. All Cucuteños have relatives in Venezuela, the border is "imaginary." In 2010, people did not study. They would prefer working as 'Pimpineros'. It was the last business option with Venezuela.

Today, the reality is that people lack education, there is no wealth anymore, there are no Venezuelans to buy the products sold in Cucuta. In addition, uneducated and corrupt people began to rule. They have never thought in big terms, there is no industrialization. I also think that what is lacking is a sense of belonging. There is no growth perspective versus what exists in Antioquia, for example. It is time to change our vision and stop looking towards Venezuela. The government fears that the young people who studied abroad will not return.

#### **F: What can you tell about UNIMINUTO (CMD University) and its presence in Cucuta?**

FGH: Initially, UNIMINUTO received no help from the municipality or the department. They started ten years ago. To open the school, they did not need authorization from the department, only from the minister of education. They started in a little house with 30 students, and now, they have trained 5,000 people (3,000 students, 2,000

graduates). UNIMINUTO succeeded in giving a different atmosphere to Cucuta, focusing on education.

**F: How was the area of El Rodeo some decades ago?**

FGH: In the 1990s, the issue of paramilitarism began in the Rodeo with one or two dead persons. The CMD left El Rodeo for fear of violence. With the departure of the CMD, the invasion grew. Around the year 2000, the mayor was promoting the invasion of private lots. Then, in 2010, the CMD school was re-opened, but with the creation of mega schools, it stopped working because people had no means to pay the tuition. In 2019, I suggested making an alliance with the mayor and thanks to Father Camilo, the legalisation process of the informal settlements began.

In my view, the next step for the Rodeo after the legalisation of the properties will be to integrate more the CMD and look for other allies.

**14.1.2 – Cristina Santos. Head of legalisation process (CMD)**

**F: What are the instruments that the Mayor's Office has to legalize and incorporate informal settlements into the city? Do you think they are efficient?**

CS: The instruments are the law. There is a decree that allows the legalisation of urban settlements. Another decree defines that territorial entities must do this for free for people who have been in invasion areas for more than 10 years. Those instruments are not sufficient or efficient, but it is not because the instruments are bad; it is because the municipality has a great limitation of resources and operational capacity. The municipality does not have official employees to do fieldwork. Without those resources, the instruments are left unframed. Let me explain to you a bit more about the different phases.

**Phase 1:** Legalisation of the 'human settlement'. The law establishes that it should be done by the municipality, but several entities are cooperating with this like the CMD, UNHCR and the German Agency GIZ. There are three main points for this phase:

**Social:** They must inform the community and do a characterisation of the families and their living conditions. A minimum of 51% of the families should be informed. The CMD asks the planning office for a subdivision licence of El Rodeo into 12 settlements (In El Rodeo, there are 12 settlements or 'neighbourhoods' and in El Resumen, 2 more).

**Technical:** Topographical, geological, and hydrological studies must be done (assessing limits and risks, if there is a risk, then the settlement is not legalised).

**Legal.** The planning office issues a decree to incorporate the settlement into the city. They also make an urban proposal: private and public limits, land use, green spaces, streets, facilities, density.

**Phase 2:** Title deeds of each house. The CMD gives title deeds to each family involved in the process. They have to pay 20,000 pesos /m<sup>2</sup> (4.6 euros) to pay taxes. The problem is that the families have no money for this.

The trend in Cucuta is the invasion of properties and the sale of homes for business. The inhabitants and landowners become victims of this lack of action by the State to protect private property. Then the legal tools emerge to legalise them, which is nothing more than trying to make the burden less harmful for people who were deceived by third parties. It is a solution to land tenure, especially for those affected, but it does not solve the underlying problem because the people who did the damage aren't charged. There is a very complex criminal scam issue. Legal instruments end up being a solution for an already latent reality: the invasion. This is basically due to the absence of coercive control of the State, which would have prevented this to happen.

**F: In your view, what can be done for El Rodeo?**

CS: El Rodeo was a farm in a rural area outside the urban perimeter. Decree 020 of 2013 incorporated El Rodeo within the city limits for its development. It seems interesting to me to establish means of income generation. The area of El Rodeo is quite devoid of production units: manufactures, crops or something that generates income. The social issue is complicated by the lack of resources and opportunities. It would be interesting to think of solutions that can generate access for industry, business and commerce to the area ... They do not have spaces that allow them to generate income. The CMD has tried to train people in skills such as shoe manufacturing... The question is, who will buy their products?

We must think of an interrelation between industries and micro-businesses. However, it is not easy to propose a leather factory, for instance, because there are no spaces. My question is, how to achieve production chains with the spaces that already exist? It does not imply a large investment in infrastructure. The same happens with the absence of spaces for children.

### 14.1.3 – Legalisation process Team (CMD)

Alfredo Carvajal, Alejandra Bermon, Catalina Rodriguez

**F: How is the legalisation process going?**

AC: None of the settlements has been legalised. The only settlement where the process has been continuously moving is in the Juan Pablo II neighbourhood, but the mayor's office has no intentions to approve the legalisation because one of the blocks is in a risk zone, and the geological studies have not been delivered yet. The CMD is in the process of identifying empty lots that are fenced and have an alleged owner. Valles del Giron is a neighbourhood that floods every time it rains. The local leader does not want to proceed with the legalisation of the neighbourhood because the residents are afraid that once the neighbourhood is legalised, the government will not help them to solve the flooding issue. Given this response, the legalisation

team of the CMD has tried to explain to the community that legalisation can even help to effectively solve this problem, but the people refuse to support this.

AB: To complement Alfredo's argument, there is a lack of architects in the planning office to make things real. Architect Yalila left, and the new architect is not doing fieldwork. On the other hand, the German Cooperation Agency GIZ has a part-time architect working on this, but the responsibility lies directly in the planning office.

**F: What will happen when people get their legalisation? Are they going to sell and invade other plots?**

AB: We don't believe that it will be the case. People want to stay and solve their flooding issue.

Regarding data collection for the legalisation, a possible solution would be to implement digital forms where the information remains automatically in the system at once. The problem is that in most of these places, there is no internet signal. The same happens with access to transport. One of the main requirements of the Mayor's Office for the legalisation of these neighbourhoods is that the roads should be accessible. However, it doesn't make sense to ask people to build their roads when they have no means to live. The government should be responsible for this.

#### 14.1.4 – **Giovani Bolanos. Project Leader CMD Cucuta**

**F: What do you think are the advantages of the Temporary Statute for Migrant Protection (ETPM)?**

GB: The regularization allows access to credit, to work, to firm a contract. After five years, Venezuelans can have access to a formal working visa. During the next ten years, they can go to the visa regime and opt for a foreigner ID. With this process, according to Juan Francisco Espinoza (Director of Colombia's department of migration), 'the entire population involved enters the social security system, and their service fee is low.' They move from a subsidized regime into a contributory regime. They start paying taxes.

**F: How do you think this benefits the informality rates? The economy and the human settlements?**

GB: The ETPM is a key tool to enforce the rights and duties of Venezuelan migrants. But if they are not subject to rights... less to duties. In this way, regularization puts into practice the theory of welcoming Venezuelans as a brother country and including them in the economic reactivation of the country. Likewise, Venezuelans can access a more solid health system and are no longer a burden to the State.



## **F: What do you think are the main challenges of El Rodeo?**

GB: Organizing ourselves.

There is 'Micro-political populism'. Community leaders have individual interests that undermine the flow of information between residents and the agents involved in the legalisation process. For example, in the Valles del Giron neighbourhood, flooding issues are hindering legalisation. Community leaders want to stop the legalisation process so that the Mayor's Office can solve the flood issues, but what they don't know is that by legalising the neighbourhood, they can have more guarantees from the municipality to mitigate risk. On the other hand, in other settlements where at least one block has geological problems, the neighbourhood cannot be legalised. This is the case in Juan Pablo II, where 90% of the process was completed, but the Mayor's Office will not allow legalisation. In some of these neighbourhoods, confidence in the CMD rose, in others it didn't. Some people take the issue personally and do not think about it collectively.

## **F: Who do you think could be the main allies of El Rodeo after the Regional Agenda? How could the government be more involved?**

GB: I think that we all lack more synergy, both between cooperation entities and within institutions. We are all called to propose, not just to protest. It is possible to make visible the work that is done in the academy in practice, but it requires political will and organization. In other words, we cannot stay just with a speech.

GB: Even if people have the intention of organizing themselves, there is not enough common identity to think of themselves as a community from the territory and not individually. There are initiatives from the UNHCR, ACIDI-VOCA, Norwegian Council (interested in urban planning issues). The NGOs main aid is humanitarian aid. Empowering people through technology is important. For instance, we received funds to give 'tablets' to some of the active neighbours.

### **14.1.5 – Miguel Peñaranda. Director of the AMC**

There were two meetings held with the architect Miguel Peñaranda, Director of the Metropolitan Area of Cucuta (AMC). First, a virtual meeting to present the topic of the thesis work, and the second was an interview in his office.

#### **Virtual meeting summary**

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Juan Fernando Pacheco (CMD), the moderator of the meeting, spoke of the interest that the CMD and the AMC have in making a link with European universities on cooperation and knowledge exchange issues, collaborating especially in depressed sectors of the city.

Peñaranda says that all Cucuteños who study architecture in Bogota have the goodwill of doing their thesis to transform Cucuta, but their work is kept in the

library. He created the Cipark precisely to make this link of research projects in architecture when he was dean of the Francisco de Paula Santander University.

Today, from the Venezuelan migration, it is expected that from the reopening of the border, 200,000 more Venezuelans will enter. The mayor's office is preparing for that with new infrastructure to welcome migrants in an organized way at the border.

The Comprehensive Neighborhood Improvement Plan and the Corazon de Barrio program seek to bring the services of the Mayor's Office to the most remote areas in Cucuta: libraries, training workshops, multiple classrooms, nurseries, rooms for the elderly, gyms, digital rooms for children to do their homework. Peñaranda also mentioned the importance of creating semi-covered squares "because the sun in Cucuta is terrifying." In other words, spaces for permanent and temporary activities such as cinema in the park and theatre. For people with limited resources, these spaces become like 'Clubs'.

### **Personal interview with Miguel Peñaranda**

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#### **F: How to articulate the urban Agenda for El Rodeo with the long-term vision of Cucuta?**

MP: The biggest challenge in Cucuta is planning. There is a POT without a comprehensive nor a structured vision of the city that allows to say: this is the way! This is the future that we dream of. They have never imagined the city in the future ... Here, they set standards just to set them. They copy them from other places, they bring them, and they don't know where they come from. The AMC is the articulator of everything. It is the heart of the Metropolitan area. Unfortunately, it had been misused by previous governments. The AMC is a supra-municipal body that is above the municipalities. In the same way that the PEMOT is the ordinance of the metropolitan area, it is above the municipal POT. The PEMOT must provide environmental, structural, mobility, and public connectivity guidelines. There is the old PEMOT, but we must structure the new one which projects the city of the future, the conurbation. Today, Cucuta, Villa del Rosario and Los Patios are part of this conurbation.

#### **F: What do you mean by conurbation?**

MP: That the municipalities join. They merge from an urban point of view. You don't know where one ends, and the other begins. Nowadays, people say that they live in Cucuta, and it turns out that they live in Los Patios. There are three adjacent municipalities, and they are still not merged.

#### **F: Now the question is, how to make a conurbation but preserving those urban-scale conditions that can no longer be handled, for example in Bogota?**

MP: I think the challenge is in making the environmental rules continue unifying the territory while maintaining scale. For example, El Zulia is a small town, but they want to become a city, while those of us who are in the city want to be part of the smaller.

## 14.1.6 – Bierman Suarez. Project Manager AMC

### **F: What is the role of the AMC?**

BS: The AMC is a decentralized organization of the other secretariats of the municipality. It responds to the six municipalities of the Metropolitan Area and is the authority in charge of mobility and public transport, managing public space projects, infrastructure, and other metropolitan projects. It seeks to integrate the entire region so that urban networks remain connected. It also seeks to integrate economic efforts to minimize the cost of small municipalities. The new mayor's office intends to form a group of professionals through the Urban Thought Centre (headed by the architect Miguel Peñaranda). It is an interdisciplinary group of architects, engineers, geographic information systems aiming to work on projects which respond to communities in all aspects. They seek to "land the projects" in the place where they are located so that they benefit from the affluence area, not just from each municipality.

### **F: What is the relationship between the AMC and the Planning Office?**

BS: There is a fluid dialogue, but they are totally independent. The board of the AMC is composed of the mayors of the municipalities. They appoint the director of the Metropolitan Area. The actors involved are Municipal Mayors (making decisions), the Planning Secretariats, and the Council of Cucuta, which approves plans, programs, and projects. The AMC manages projects for the common good of the metropolitan area.

In 2015, Camacol created a proposal called Cucuta 2050 of Camacol in response to an initiative of private investors and the Mayor's office to project the city in the long term. Unfortunately, people confused it with Cucuta's Development Plan, which has the same name.

### **F: What about the infrastructure of the Metropolitan Area?**

BS: The region is short in infrastructure, and there is also a lack of public transport regulations. The AMC is controlling the public transport routes to design a new system for the metropolitan area. We are looking for a strategic system of non-massive transportation because the infrastructure is not prepared for this. It also seeks to eradicate the 'penny war', where different companies that provide public transport services want to control all routes. Everyone wants to pass their routes around the same corner. It is necessary to regulate the signage, locate bus stations according to the points of greatest demand. They also want to design smart whereabouts that can be controlled with phone apps. Centralize the bus collection system, using vehicles of good capacity, if possible electric, etc. They have as references the models of Barcelona and Madrid. It sounds utopian, but at some point, the process has to start. Someone has to imagine and write the future so that work can begin later. A positive point is that Cucuta is a small city, with one million inhabitants in the entire metropolitan area. We can still anticipate things that cities like Bogota could no longer plan because it is already oversized. We can still learn from other's mistakes. For example, Barranquilla has failed in the transportation

system. They must change the entire physical structure and then change the transportation system.

Bierman also mentioned the Corazon de barrio initiative. He says that it works as 'urban acupuncture'. They aim to 'decentralize the city so that people commute less, do not come to the centre so much and have all the services in the commune where they live'. Bierman also talked about the dry-tropical forest. A fragile ecosystem in the region that is threatened by the indiscriminate growth of invasions. People cut down trees to build spontaneously.

#### 14.1.7 – Mayor of Cucuta Jairo Yañez

According to the mayor, the AMC is an independent body that promotes the strategic development of the six municipalities around the city. It has an urban think-tank where they seek to develop the projects which are part of the development plan in an integral way.

M: How can a Mayor's Office that does not have an office to structure projects, design them, share them with the community, do a strategic development through dialogue? We need to dignify the life of neighbourhoods with sports spaces, community halls, entrepreneurship and training centres, libraries, computer centres and urban furniture. How to stimulate the entrepreneurship of schoolboys? Integrate work with ethics, aesthetics, and logic in the hearts of the neighbourhood, so that they become true urban development initiatives.

### 14.2 – Community Interviews

Questions to understand the history of the community and the current conditions of El Rodeo. Create with the participants a brief history of the development of these neighbourhoods by drawing their narratives. This first individual approach is also intended to get closer to the participants before the workshop.

#### Base questions

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- How long have you been living here?
- How was this neighbourhood when you first arrived here?
- Why did you decide to move to this specific area?
- How many people do you live with? Are they part of your family?
- Do you have close relatives living in the neighbourhood?
- Where do you work? How do you get there?
- Do you consider the neighbourhood a safe place?
- What do you think about the legalisation process of El Rodeo?
- What do you think are the main urgencies of El Rodeo?

#### 14.2.1 – **Martha. Team coordinator CMD El Rodeo.**

Martha was a nun from a Canadian religious congregation. She decided to leave the community and dedicated herself to the educational ministry of the CMD school in El Rodeo. Currently, she lives in the area.

In 2010 there was nothing more than the CMD school at El Rodeo parcel, which was also an issue for the children. It was a technical school where children received training in bakery or electricity, among other disciplines. In 2015 the school stopped receiving scholarships while the municipality started building mega schools to provide free education in low-income neighbourhoods. The school finally closed, which was detrimental to the education of people in Comuna 8. Since 2016, the building works as a Development Centre of the CMD. It has become part of the identity of the surrounding communities, especially for the people who studied there.

When the school was closed, Martha became the coordinator of Cristo del Camino parish. She tried to develop activities in the school's fields to prevent the invasion of the lot. Today, the CMD Development Centre welcomes over 300 children for homework counselling and sports school. Children who go to school in the morning go to the centre during the afternoon and vice versa.

The last time the school was flooded was in 2005. In other words, the area is flooded every fifteen years.

Talking about the children, she said that 'they have a lot of skills, but luck is not in their favour. Their parents are primarily informal workers. There is a high crime rate and drug trafficking in these neighbourhoods. But you cannot say anything because they tell you to shut up. All the merchandise arrives in luxury vans for further distribution.' Martha received threats from a person she was trying to convince about the legalisation process. But apparently, he was involved in crimes. 'They killed him last year.'

Referring to the family composition, she said that most families are composed of single mothers, usually with many children. 'Girls are already looking for boyfriends since they are 12 years old, so when they are 15, they are already pregnant. There is a lack of dreams. We have poverty in our minds, I tell the girls. I think children are demotivated when they see that all their siblings are from different fathers.' The typical dish of the neighbourhood is rice, egg, plantains and sometimes lentils. In her view, the main opportunity is to empower young people and train them. 'Encourage them to make a difference at home, to dream of a university. But many times, they don't because they don't even have a snack'. She believes there is a waste of talent in El Rodeo.

The main issue for kids is the micro-trafficking of drugs: they give them 50 bags of personal doses; they pay them 80,000 pesos to sell them at 500 pesos in the schools. The first three samples are for free, and as it is very addictive, children would buy the fourth one. Once, they found a girl at school with a half-pound of marijuana; she was approximately 12 years old. When the dealers found out that she

had been discovered, she had to disappear from the neighbourhood. Children mix the marijuana with peppermint or lemon-grass to make it smell good.

Another issue is the elderly who are totally abandoned. There is a lack of spaces for recreation and exercising. When they opened the Development Centre and asked people what they would like to have there, they said a technology centre. Martha believes that channelling the pipes and reducing the pollution will eradicate the problem of flooding. Many people believe the same. All waste is thrown down the drain, and many still receive drinking water through hoses.

#### 14.2.2 – ‘Elizabeth’ (JAC Leader)

‘We took this land on June 23, 2012, at 7:45 pm, that was a Saturday’. Both Elizabeth and other inhabitants of the sector know exactly when they arrived at their new home, built with their own hands. Before that, they lived in the CMD urbanisation (also part of El Rodeo), where they paid a rent of 180,000 pesos in 2012. The following Tuesday to their possession, the property owner arrived at 7 am with the police and the title deeds in hand to evict them. They could not evict people because the SMAT was in Catatumbo at that time. They returned to evict them a few days later, but the residents got a lawyer to defend them.

While we are in the interview, her husband and her 32-year-old son wait in the back of the house, listening carefully. Outside you can hear the children playing in the street and one of the neighbours hammering next door.

In 2015 the police came back, but the neighbours had already set the limits of their plots. The planning office was helping the community in the regularisation of the land without considering the owner, for which a lawsuit was imposed on the municipality. Elizabeth spoke with people from the UN human rights who supported them in their cause to reach a possible negotiation. Meanwhile, they paid an architect to make the plan of the neighbourhood. ‘He set 12 meters of cession for the creek. He did not modify the court, the park, nor the communal hall. However, other people invaded those areas’.

While we were doing the interview, an urban cleaning man entered the house to request a signature from Ms Elizabeth, president of the JAC in her neighbourhood. He told us that he helped a Venezuelan family by giving them food and later stole his cell phone. Elizabeth’s husband responded with an anecdote about another Venezuelan family who robbed a person trying to help them.

Later, a lady came to visit. Elizabeth gave her an update of the meeting with the planning office regarding the legalisation process. ‘They told us that there could not be Venezuelans in the neighbourhood because that was detrimental to the process of legalisation’. She also said it was not the first time she received this advice from public officers. Most of those Venezuelans live illegally in the area and have no residence permit (PEP). The government is concerned about the amount of Venezuelans renting illegal properties in the peripheries of Cucuta.

Referring to the creek, she mentioned that the government ordered to leave a 15-meter cession instead of 12. They have to build a road and a sewer to collect the excrement that runs into the creek.

Elizabeth lives with her husband and her youngest son. She has three more daughters, but two of them live in Bucaramanga and Bogota. The third one lives in Valles de Giron, a few meters from her place. They are from Bucaramanga, but they emigrated to Cucuta because it is cheaper. Her husband works in construction, and her son is a carpenter, but none of them has a job.

With the flood, the water rose to the level of the beds, and they lost the mattresses. Now they receive help from their relatives and siblings.

She considers the Los Canarios neighbourhood to be quiet and calm. In fact, there was a "pot house" (where they sell drugs) and the community and the police managed to get them out quickly. However, they are aware that in El Rodeo, there are two more pots.

Since 2016 she has been the local leader of her neighbourhood. Before that, each block had its own leader.

The previous Mayor's Office installed the sewers, public lighting, and electricity to charge the public services, and constitutionally that is not possible. According to Elizabeth, the new government cannot keep improving the settlements if they are not constituted as legal neighbourhoods.

In some way, the government's intention is to accelerate the legalisation process and prevent the spread of informal settlements. Unfortunately, the Mayor's Office does not have the resources to promote this.

The first thing people do when invading a lot is to define the limits of their settlement and raise tents or 'cambuches'. The roads are also established by the community. Later, they get an architect to draw up the neighbourhood's plan with a topographic study and formalise measurements. The new settlements are designed so that water runoff flows directly into the creeks. In Elizabeth's block, all the plots are 6 x 12m. They agreed with the architect that the tracks would have 4 meters for cars and one meter of sidewalks on each side. 'We take care of open spaces to prevent other invaders from coming'. They removed the trees in the middle of the streets and planted new ones at the entrance of their houses.

The light was initially taken from the lamppost at the school entrance. 'Honestly, that was stealing the light', says Elizabeth between laughs and embarrassment. Some years later, they received gas and electricity. However, they still receive water by hoses.

### 14.2.3 – ‘Rafael’ (JAC Leader)

Rafael has been living in El Rodeo since February 13, 2010. He was displaced by violence from Sardinata, a municipality in the Catatumbo region. He arrived in Cucuta in 2007 after being threatened and witnessed the death of his brother-in-law.

He lives with his family in a self-built house, and one of his sisters lives next door. He works in construction, while his daughter is a hairdresser and has a hair salon on the house's first floor. One of his sons works in a mine, and the other is studying a course in technology. When I asked him about his perception of Venezuelan migrants, he said of being affected by their cheap labour. A house that he used to sell for 9 million pesos was made by a Venezuelan for 6 or 7 million. He argues that robbery and crime also increased during the last years.

According to Rafael, the immediate emergency in the neighbourhood is water management to prevent floods and collect wastewater. ‘The community is willing to collaborate in whatever way, but since the projects are developed at the national level, nothing happens’. If the municipality provides materials and incentives, the community could help in the construction of public works. Rafael said that after the last political campaign, he managed to get the money to pave two streets, one of the common methods used by politicians to gain votes. As for the rest, he says that the government never appears in El Rodeo, except when there are serious problems such as flooding.

About the legalisation, he stated that the community was interested in the subject a long time ago. But it was uncertain who were the landowners as there were many scammers in the area. When they finally managed to speak with the CMD in Bogota, they made a very high proposal that the community could not afford. However, the inhabitants are interested in having deeds of their houses. He believes that the CMD is more interested in fixing “papers” of the land than in the inhabitants themselves.

### 14.2.4 – ‘Luz’ – Inhabitant of ‘23 de Enero’ neighbourhood, El Rodeo

She lives with four people. She has relatives in Valles del Giron and Los Canarios neighbourhoods, also in El Rodeo. Some of them bought their houses, and others took over the land. She has ties to the area since her relatives live nearby. She mentioned that pirate developers build ranches and rent them to poor people. However, there is high housing demand. In her neighbourhood, the subdivision of lots is 5.5 x 13 metres.

She has no job, and she is the breadwinner in her family. She has worked for several years as a security guard. She considers her neighbourhood to be safe, even though there are young people using drugs.

Also, she mentioned that the Mayor's Office is helping the families affected by the last flooding. ‘People who lost their homes are entitled to 3 months of rent (250,000 pesos), which is very little given the circumstances.



## 14.3 – Workshops

### Workshop with local leaders from El Rodeo

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Time: 3 hours with 15 minutes break.

#### Objectives:

- Identify what are the main urgencies and opportunities of El Rodeo.
- Understand the needs and desires of the inhabitants of El Rodeo.
- How do participants envision El Rodeo in the future?

#### Methods:

Divide the group in teams between 3 and 4 members (there was a person from the CMD helping to guide the activity). Usually, small groups can make the activity more productive as individuals have more chance to talk (in the end there were 8 participants).

- Ice breaker activity.
- Using a map of El Rodeo (1 map per team), identify the main landmarks, local centres, places of meeting and unsafe places with the help of the participants.
- Fill a matrix of needs and desires that inhabitants have in El Rodeo (some of the elements were the same as in the previous activity, but some others were difficult to locate in space).
- How do participants envision El Rodeo? Which elements and structures do they consider important for the community?

### Workshop with children from the El Rodeo

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Time: 2 hours with 15 minutes break.

#### Objectives:

- What are the likes and dislikes children have of their neighbourhood?
- Understand the needs and desires of the children of El Rodeo. What is missing?

#### Methods:

- Ice breaker activity
- Using small colour cards (2 per participant), ask the children to draw which are the things they like (blue card) and dislike (red card) from their neighbourhoods.
- Create a matrix of needs and desires for El Rodeo using post-its.

## 14.4 – Cucuta: a Border City

Historic maps

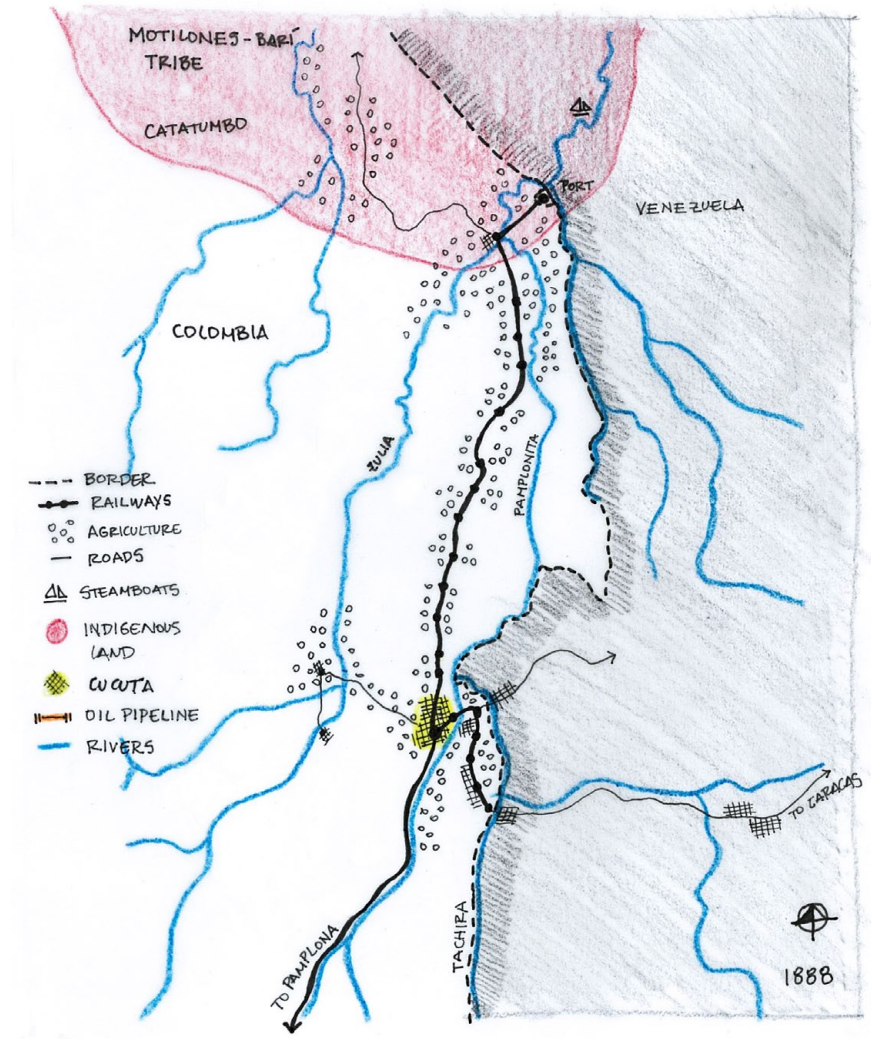


FIG. 14.1 Map of Cucuta and the region in 1888. Interpretation developed by the author, based on historical information from multiple sources.

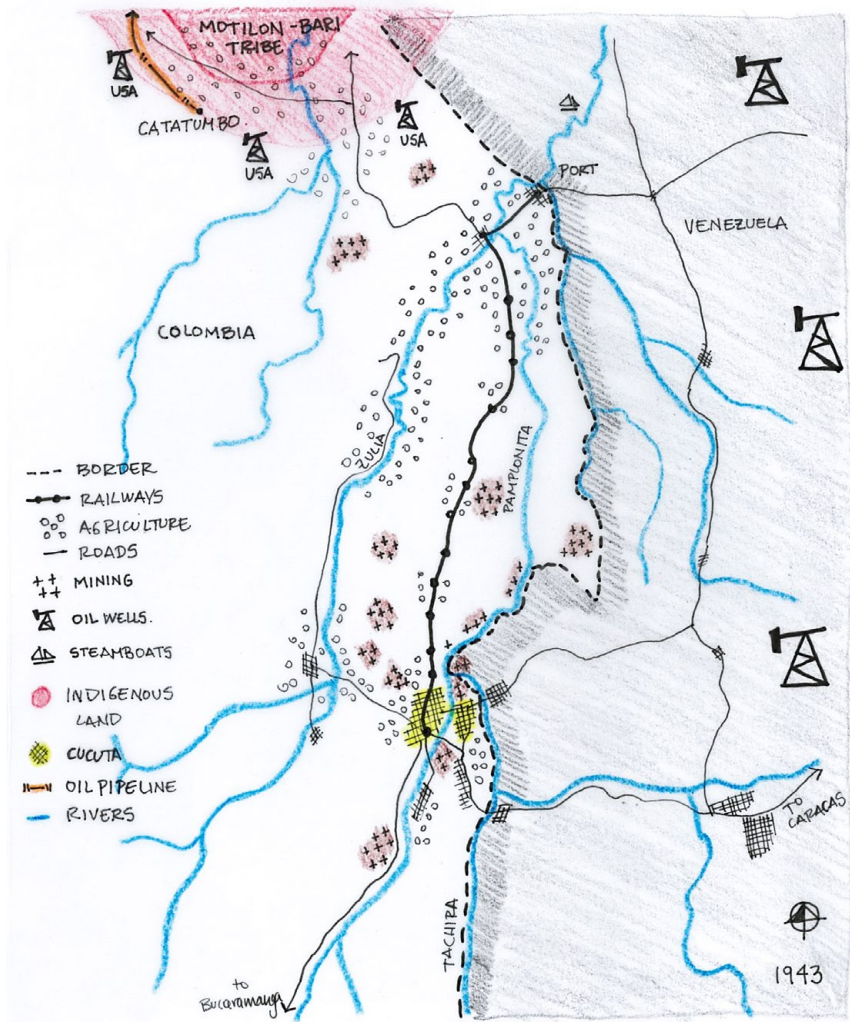


FIG. 14.2 Map of Cucuta and the region in 1943. Interpretation developed by the author, based on historical information from multiple sources.

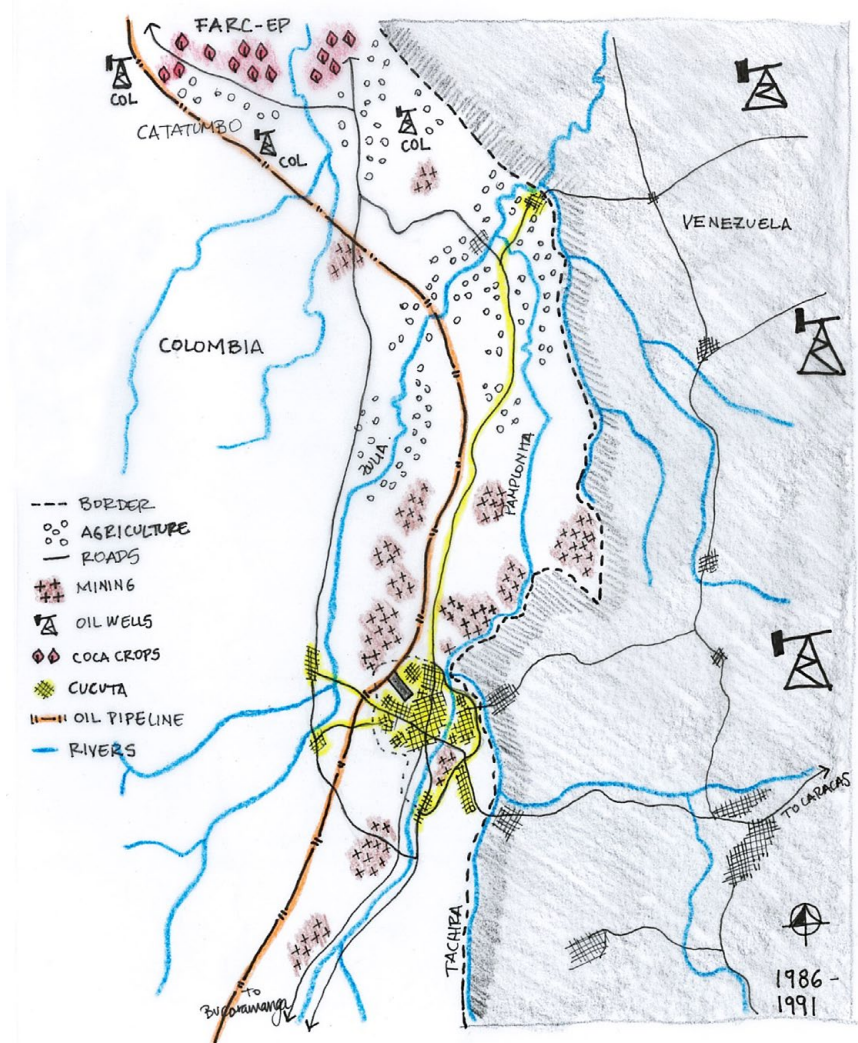


FIG. 14.3 Map of Cucuta and the region in 1986. Interpretation developed by the author, based on historical information from multiple sources.

## 14.5 – Layer analysis of El Rodeo

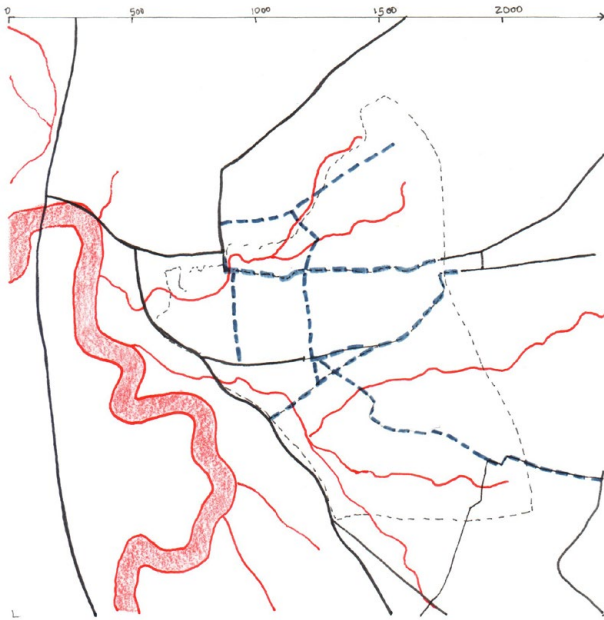


FIG. 14.4 The two networks: Water (red) and traffic (black). Pedestrian routes in dashed blue. Based on (Tjallingii, 2015). Drawing by the author.

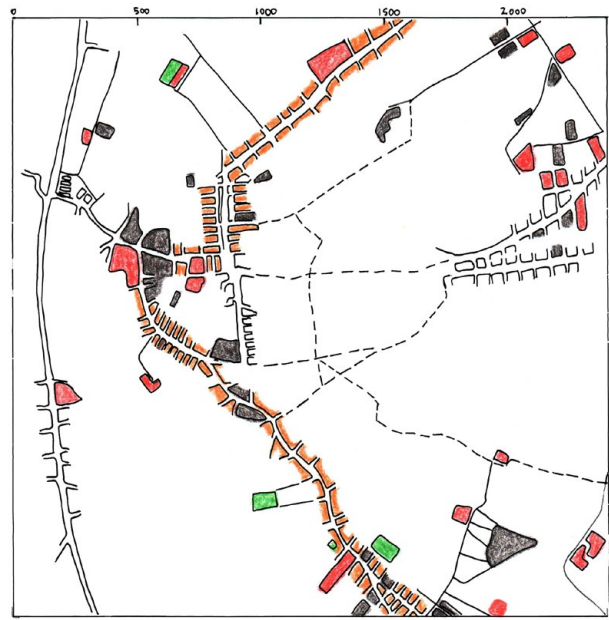


FIG. 14.5 Places of encounter in El Rodeo. Commerce (orange), small industries (black), facilities (red) and parks (green). Drawing by the author.

## 14.6 – Two strategies for El Rodeo

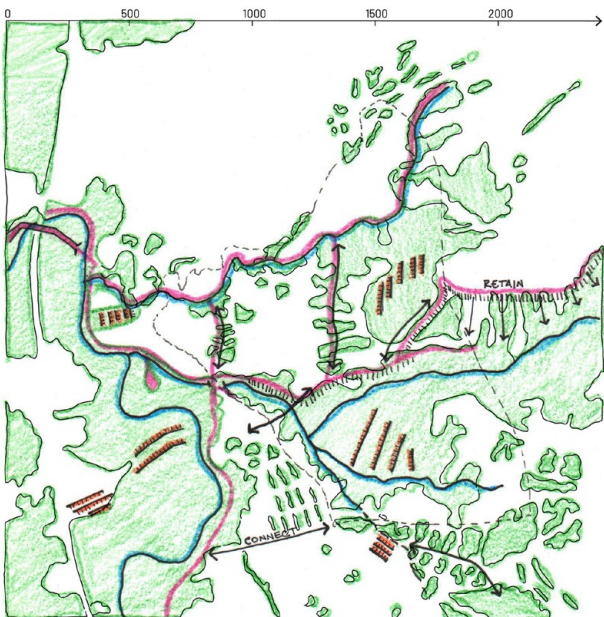


FIG. 14.6 Strategy 1. Complete the green network. Proposed corridors (pink) and terraces (orange). Drawing by the author.

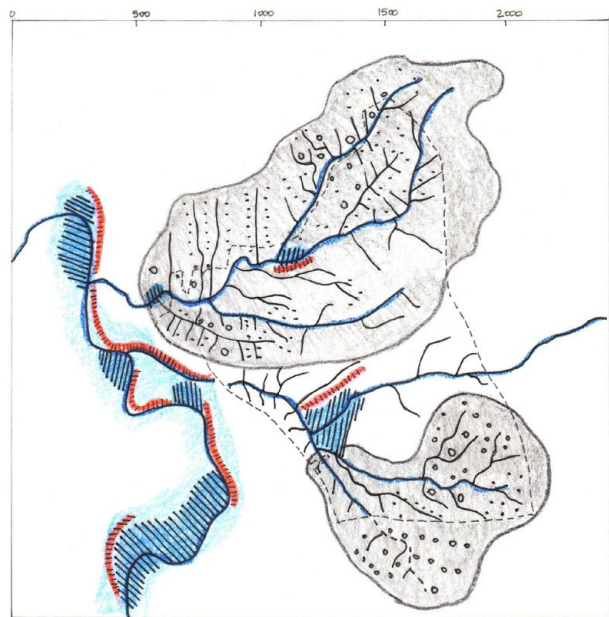


FIG. 14.7 Strategy 2. Water management. Reshape the local governance based on the watershed structure. Flooding areas (blue) and dikes (orange). Drawing by the author.

## 14.7 – Space syntax analyses for El Rodeo

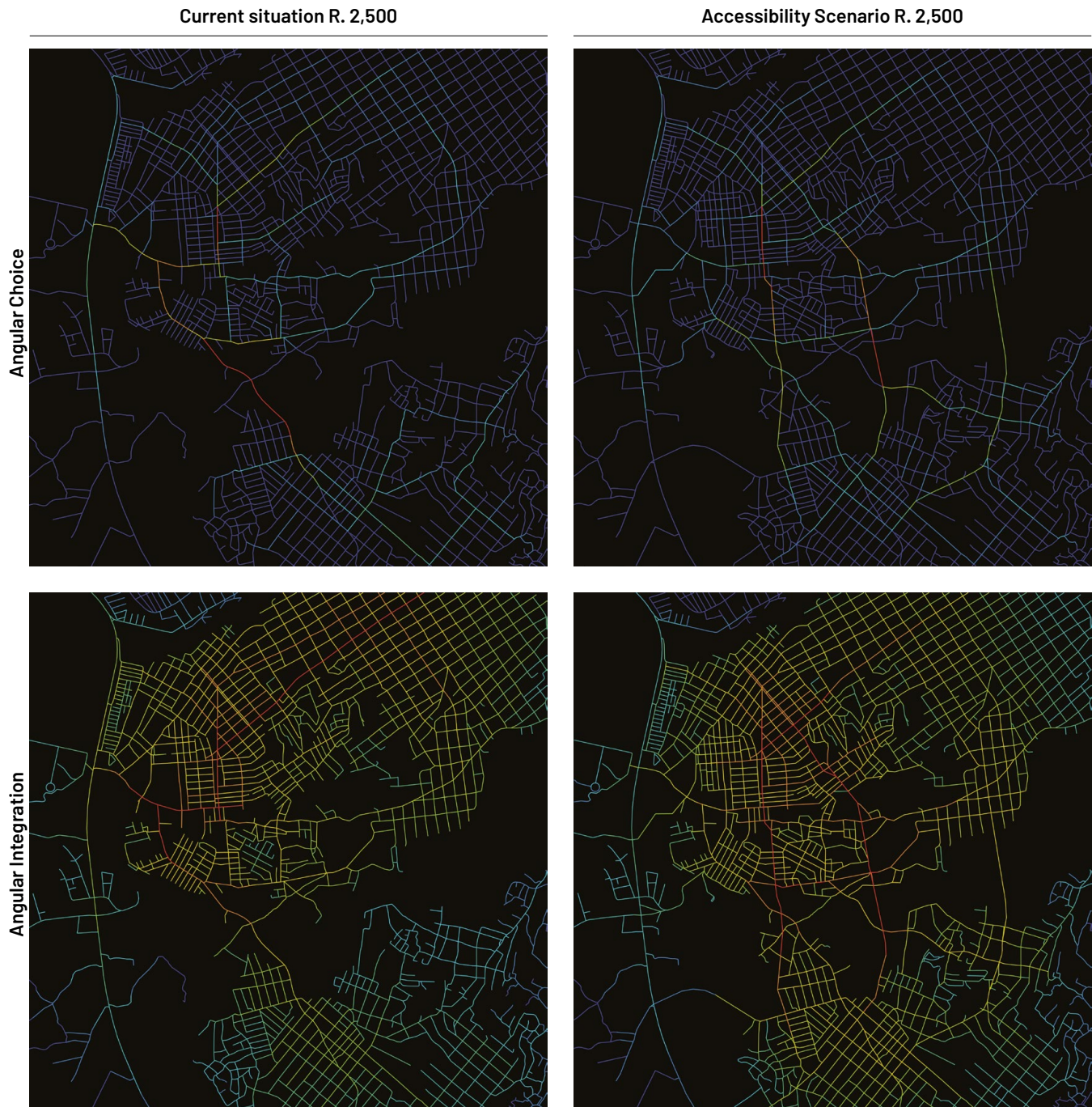
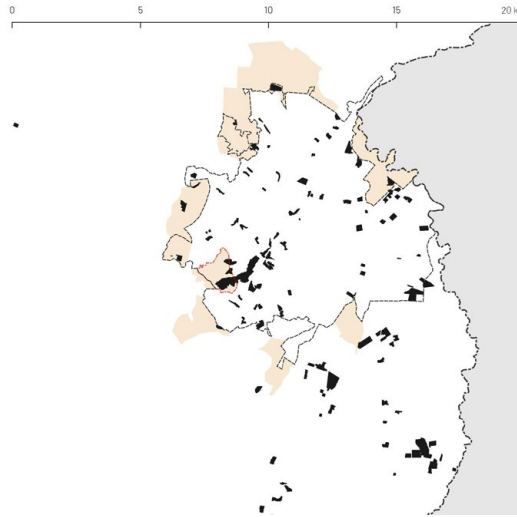
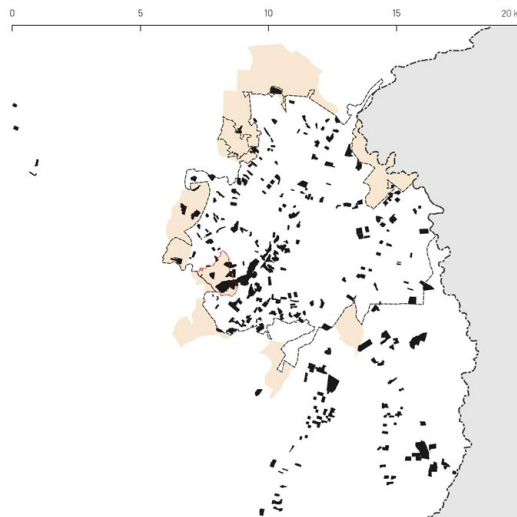


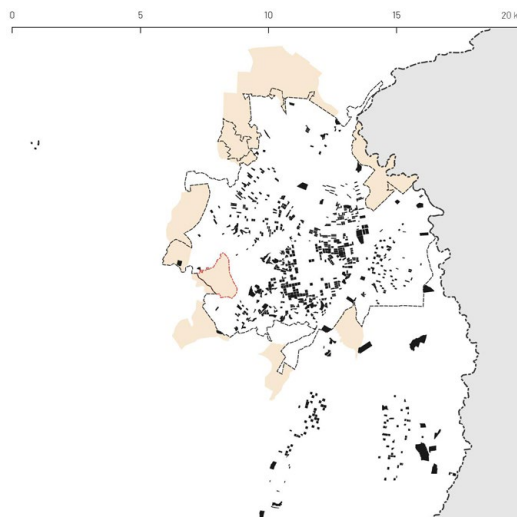
FIG. 14.8 Space Syntax analyses for the area of El Rodeo. Run with Depthmap, UCL. Maps developed by the author with layer of roads from OSM and proposed street network.



0-9 years



10-19 years



Over 80 years

FIG. 14.9 Maps showing the highest count of age groups per block. Maps developed by the author with information from DANE - CNPV 2018

# Rudo Rico.

Collective land

Spontaneous occupation.

Following the current trend in El Rodeo and integrating in the urban fabric.

The internal streets follow the course of water runoffs.  
local facilities as part of the new islands.

↓  
High constitutedness.

low integration of the collective concept.

Courtyards are individual.

Microbusinesses in the exterior street network.

- Everything is one floor except the front road with commerce.

- No spatial relationship with surrounding fabric (open space).

- No need to pay for administration?

- People might enlarge their houses and lose their backyard



current trend.

→ No progress or high

limitations.

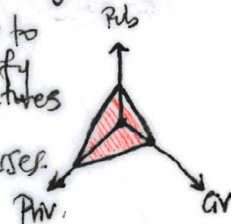
No technical assistance for the construction.

→ coordination of new infrastructure. Needs government support.

Advantages.

- Easier for the CMD to legalize an existing reality. Can be replicated in every settlement.

- Easy to modify structures for businesses.



people take decisions in every day intervention.

- overcrowded community with basic infrastructure. CIT does not ensure flooding and pollution



## Uruguay - Collective Land Housing Cooperative

- layout for new housing
- Applies the 2 landscape strategies of border parks connecting and water management.

- There is a transition from private space (housing units) to collective/private gardens, then to collective park and public street. But the ownership is collective in all cases. There are just different units that safeguard privacy and (enclosed) and more public (open) spaces.

- The advantage of having different typologies and heights of buildings, enables to open more space for water retention and biophysical connectivity.

- Local for different size of businesses can take place on the front road while local facilities happen towards the interior, like creches, salon communal, pitches, playroom, or even a ~~cafe~~ cafe.

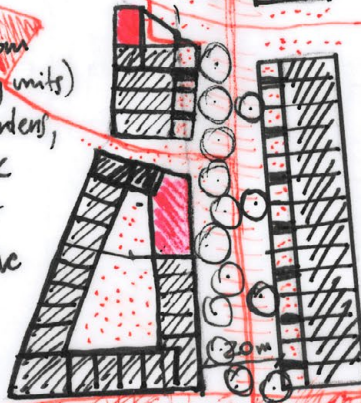
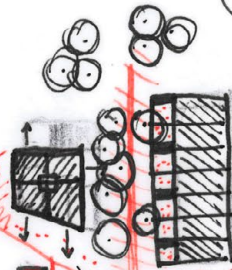


Not = Horizontal property regime.

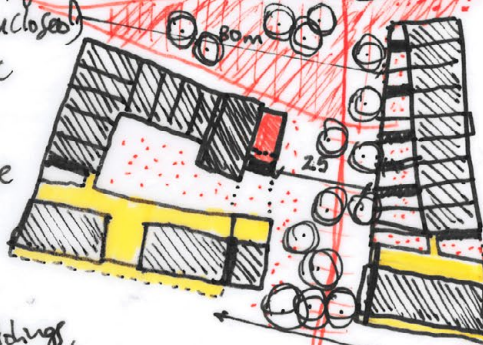
→ Needs planning & funds.  
- limitations

Possible closing - external fence may appear.

- Can only happen in vacant lots with low risk of flooding



- Need a high support from international cooperatives to reply the model in El Podes and access low interest rates from the Government.
- If it takes time, people will take over the land.



### Other Advantages:

- Allocate more housing than its context can help to free up space for pocket parks
- Better housing conditions at low price



★ Not easy to modify spatial conditions of housing.

Pri

Civ

Pub.

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The TU Delft logo features a stylized flame icon above the text "TU Delft".

TU Delft

The EMU logo consists of the text "EUROPEAN POST-MASTER IN URBANISM" stacked above the large letters "EMU". To the right of "EMU" is a red map of Europe. Below the text is a faint, semi-transparent map of the world.

EUROPEAN  
POST-MASTER  
IN URBANISM **EMU**  
strategies and design for  
cities and territories

EL RODEO, 2020