



UNDRESSING THE DESERT

Restoring environmental justice regarding clandestine landfills in Alto Hospicio and Iquique, for human and more-than-human entities by reshaping urban-desert imaginaries through activism.

COLOPHON

Undressing the Desert

Restoring environmental justice regarding clandestine landfills in Alto Hospicio and Iquique, for human and more-than-human entities by reshaping urban-desert imaginaries through activism.

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ABSTRACT

The graduation project seeks to investigate how activism driven reshaping of urban-desert imaginaries can help to restore environmental justice for human and more-than-human entities in Iquique and Alto Hospicio, Chile, regarding clandestine landfills. It examines how urban-desert imaginaries, referring to the perceptions of desert landscapes in relation to urbanization and related activities, of the past and present enable the proliferation of clandestine landfills as well as how activist efforts are reshaping these imaginaries. Through fieldwork, expert interviews, policy review and secondary sources a pattern language to restore environmental justice damaged by textile waste accumulation in the desert has been developed outlining actions and strategies to be executed by different stakeholders from the civic, public and private domain. Finally, the patterns with spatial implications have been mapped onto the territory of Iquique and Alto Hospicio to demonstrate the application of the pattern language by example.

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PART A - INTRODUCTION

0. PERSONAL MOTIVATION

My personal motivation for this project is threefold. First and foremost my interest for the topic was sparked by my exchange to Chile in 2023. Having lived there for half a year I gained some affinity with the Chilean context along with some of knowledge. Which is by no means to say I am an expert, if not just a bit familiar. At the Universidad of Chile, the host university of my exchange, I took theoretical courses about social and urban geography and territorial planning and organization. These courses together with the experience of living in the capital city of Santiago for five months and travelling to other parts of Chile, have provided me with at least a basic understanding of the Chilean context. As the courses I followed in Santiago were primarily theoretical, when my time came to go home I felt it was a shame to not have done a project working within this context. Therefore, I decided I would like my thesis project to be based in Chile.

Secondly, one of my travels in Chile was to San Pedro de Atacama, where for the first time in my life I have seen a desert, a species of natural landscape that does not exist in Europe. I was truly mesmerized by the beauty and magnificence of the landscape. Shortly after my return to Santiago from this trip, a friend showed me an article about the mountains of clothing being dumped in that very same Atacama desert. I was shocked.

I was shocked at how anyone would dare to contaminate such natural sublimity and how apparently nothing to little was being done about it. I was also shocked at the quantity of clothing. I had known already for a while that the (fast) fashion industry was one of the most polluting on the planet. For that very reason, I had already adjusted my own consumption behavior, exchanging clothes with others rather than buying, and when buying, buying second hand rather than new. Therefore, I was all the more shocked seeing how the collective behavior of humankind regarding clothing consumption is leading to atrocities such as this one, which is the third and final element of my personal motivation for this project.

1. INTRODUCTION

The region of Tarapacá is the second most northern region of Chile, located in the Atacama Desert. The region's capital is Iquique, an important port city where port activity is stimulated by the ZOFRI. The Zona Franca de Iquique is one of three free zones in Chile, facilitated by the existence of legal regulation for free zones in Chile since 1973 (AZFA, 2022). The objective of these free zones is to stimulate economic welfare in remote regions of the national territory, mitigating the negative effects of centralization.

Over recent decades, the import of large quantities of used clothing, estimated at 59,000 tons annually, has made Iquique one of the prime entrances in the continent for this commodity. However, as much of the imported volume remains unsold, up to 39,000 tons of used clothing is being dumped in the desert landscape of the municipality of Alto Hospicio, which is part of the province of Iquique and adjacent to the municipality of Iquique. Here, the decay of textile waste can take up to 200 years due to the extremely arid climate and the synthetic nature of materials used in clothing. Furthermore, the piles of clothing are frequently set on fire to make them disappear, releasing giant plumes of smoke into the air, intoxicating the environment and its human and more-than-human inhabitants.

The efforts of activist initiatives have resulted in an increase in global attention for the issue of clandestine landfills, opening the road to improvement. However, the multiscale nature of the causes of the issue and its local socio-economic entanglements, in addition to alleged governmental neglect regarding enforcement of environmental protection, make this situation a complex problem requiring contributions from different fields of expertise and collaboration to generate a sustainable solution for Iquique and Alto Hospicio.

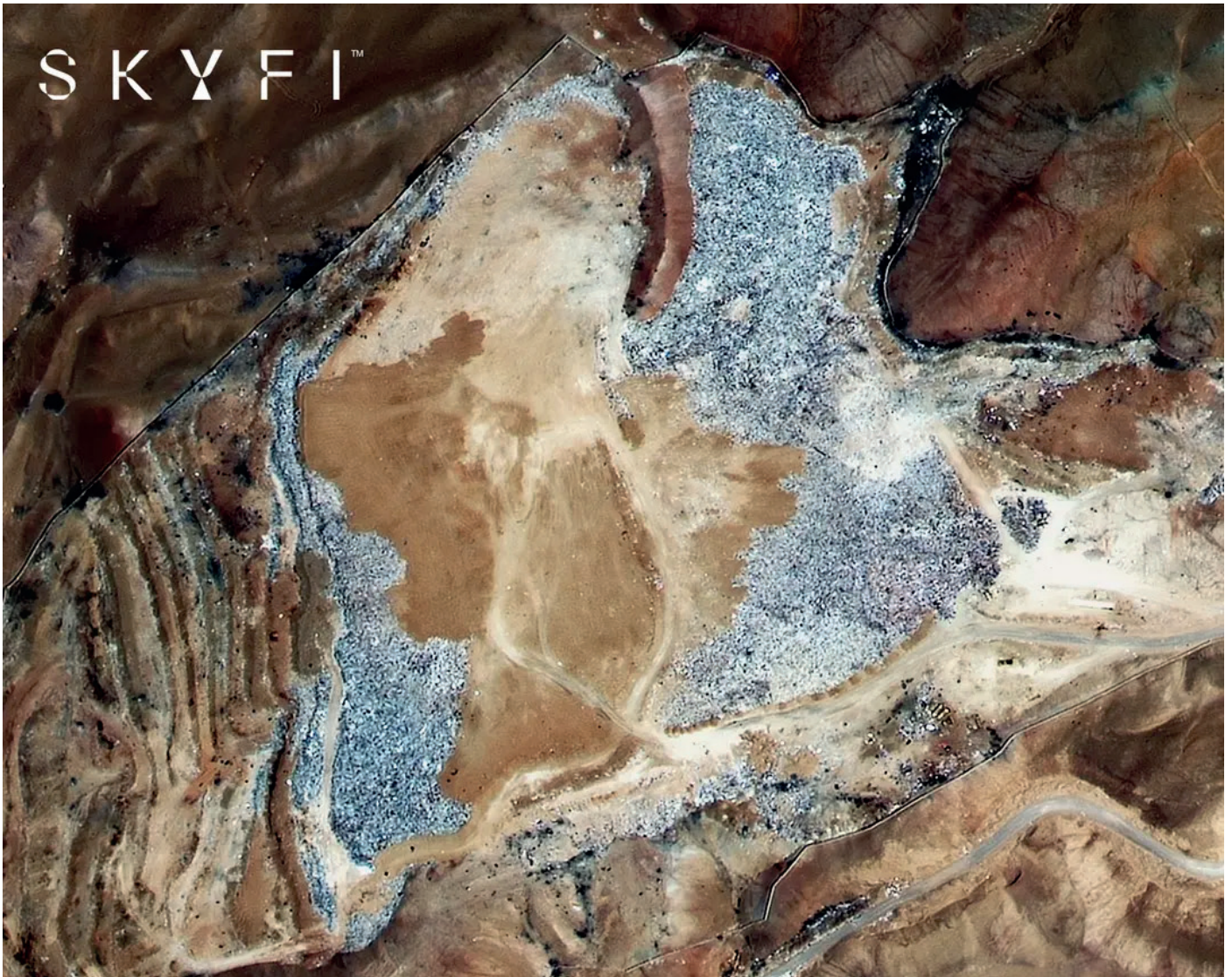


Image 1.1: Massive Clothes Pile in Chile's Atacama Desert, 50 cm, Optical Ground Truth
Source: SkyFi, 2022

2. PROBLEM STATEMENT

End of chian/Wasted desert/Social disparities

The human and more-than-human inhabitants of the municipality of Alto Hospicio are facing a continuous environmental hazard resulting from the dumping and burning of textile waste on clandestine landfills in the desert landscape. Social disparities are being exacerbated by the phenomenon as individuals from vulnerable groups, such as migrants attempt to make a living from these landfills. The relation between urbanization and the desert landscape has been dominated by colonial imaginaries, perceiving and representing desert-space as empty space. There is a dire need to reshape the imaginaries that dictate the relation between the urban and the desert in Iquique and Alto Hospicio in order to restore environmental justice. It is important that change of perception and representation is supported by local communities, therefore grassroots activism plays a pivotal role in the envisioning of an alternative future scenario for the future of Iquique and Alto Hospicio.

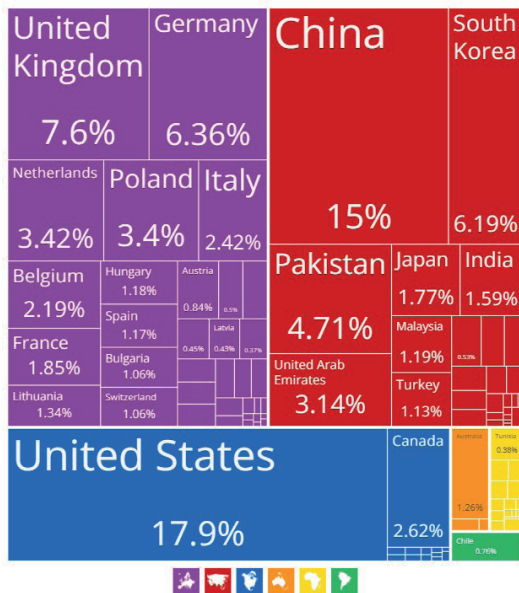


Image 2.1: Exporters of used clothing
Source: OEC, n.d.

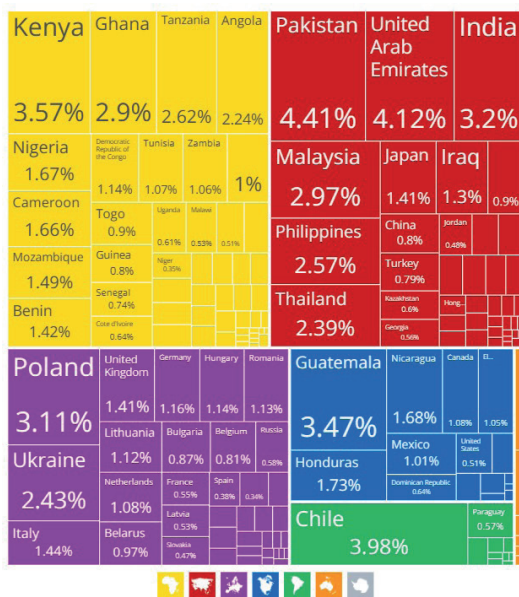


Image 2.2: Importers of used clothing 2022
Source: OEC, n.d.

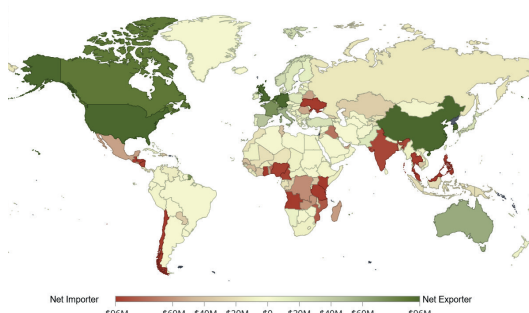


Image 2.3: Net trade in used textile 2022
Source: OEC, n.d.

2.1 End of chain

Chile is the biggest importer of used clothing in South America (OEC, n.d.). This positions Iquique and Alto Hospicio at the end of the global fashion industry value chain, an industry increasingly scrutinized for its negative social and environmental impact. After the oil industry, it is even considered the second most polluting industry in the world (UN Launches Drive to Highlight Environmental Cost of Staying Fashionable, 2021). Not only does the fashion industry usurp 93 billion cubic meters of water per year, it also produces 8% of global greenhouse gas emissions, exceeding the carbon emissions produced by all international flights and maritime shipping combined (ibid). Pressing social issues in the fashion industry, where the majority of the workers is female, include intimidation and sexual abuse in addition to low wages and unsafe working conditions. The lack of concern for the wellbeing of workers in the fashion industry was tragically highlighted in 2013 when the Rana Plaza building in Bangladesh collapsed, killing over 1,100 people and injuring 2,600 more (Rana Plaza: Never Again, 2014).

Moreover, social and environmental impacts of the fashion industry are being exacerbated by the trending business model referred to as 'fast fashion'. By strategically aiming for low-cost production and pricing and offering up to 24 new clothing collections per year, instead of the previous average of two seasons per year, big brands like Zara and H&M encourage consumers to frequently buy new clothes and consequently discard previously owned garments prematurely (Remy et al., 2016). As a result, consumers buy 60% more items, but keep them only half as long as they used to 15 years before (ibid). This demonstrates the increased disposability of garments. The increased disposability of fashion in combination with the increased production, which has doubled between 2000 and 2014 (ibid), leads to more textile waste. Meanwhile, textile waste collection rates are low, recycling technologies are insufficient, markets for recycled products are too small to absorb the potential volume and thus, "for every 5 garments produced, the equivalent of 3 end up in a landfill or incinerated each year" (ibid).

Furthermore, discarded garments that are being collected in wealthy countries are often being exported to developing countries under the pretense of charity. However, at the 1989 UNEP convention the term Waste Colonialism was coined by group of African countries to express their concern regarding international systems of waste management and the tendency to dump toxic waste in the Global South (Walsh et al., 2023). Waste Colonialism refers to the act of framing export of (textile) waste to developing countries as charity, in spite of the increasing evidence of social and environmental problems in the receiving countries. Moreover, the concept of waste colonialism also refers to the asymmetrical structure of trade arrangements regarding the export of used textile as the World Trade Organization and agreements on tariffs favor the interest of richer, exporting countries rather than the interests of poorer receiving countries that are exposed to risks and costs (Walsh et al., 2023).



Image 2.4: Desert Bloom
Source: Fundación Terram, 2024



Image 2.5: Geoglyph *El Gigante de Tarapacá*
Source: (Gigante De Tarapacá, 2020)

2.2 Wasted desert

Currently, roughly 600 hectares of desert landscape in Alto Hospicio are affected by clandestine landfills (Corporación Ciudades, 2024). These landfills are the product of discarded import leftovers. To make the volumes of textile waste disappear, they are often burned, releasing toxic fumes into the environment and leaving behind charred residues. The contamination primarily concerns microplastics being released into the atmosphere, as synthetic fibers are commonly used in clothing (Walsh et al., 2023).

Such vast areas of desert landscape filled with waste are endangering a hidden, yet precious and vulnerable ecosystem. Although the desert may appear to be a lifeless landscape, the contrary is proven whenever a Desert Bloom occurs. This is a phenomenon in the Atacama Desert where dormant seeds germinate into a natural spectacle of white and fuchsia flowers, representing over 200 species (Vermillion, 2023). This demonstrates what a terrible waste it is to compromise the sublimity of the desert.

The colonization of desert landscapes in this way reflects a distorted relationship between humankind and the natural environment it exists in. Whereas previous human civilizations inhabiting these lands left marks in the shape of geoglyphs, the mark left by modern society is trash. This demonstrates a high degree of disregard for the environment we live in, wasting the desert.

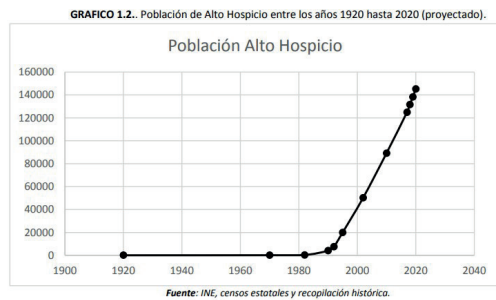


Image 2.6: Population growth Alto Hospicio 1920-2020
Source: PLADECO 2017-2020 Alto Hospicio



Image 2.7: Megacampamentos in Iquique-Alto Hospicio
Source: Poduje, I. on X, 2022



Image 2.8: A local activist narrates a site-visit.
Source: Desierto Vestido on Instagram, 2024

2.3 Social disparities

Alto Hospicio has experienced rapid growth in population since it was officially founded as commune in the province of Iquique in 2004 (Subdere, n.d.). As the pace of growth was higher than On X, politician Ivan Poduje laments that there is too little attention for the extreme growth of informal settlements stating that “In Alto Hospicio, camps increased population by 26% in only 3 years” (2022).

The growth is in part due to a trend of urbanization and regional migration drawing people from smaller settlement to the coastal cities in the North of Chile, including Arica, Antofagasta and Iquique. In addition to this regional urbanization there is also a trend of international migrants coming into Northern Chile, especially from Venezuela (Maggioni, 2024). As these migrants make a long and challenging journey hoping to find a better future and taking only what they can carry, they frequently end up inhabiting these informal settlements. The proximity of the clandestine landfills to the informal settlements adds to the precarity of the living conditions of this vulnerable group, as they state that the landfills are a constant source of bad smell and flies (ibid). Especially the practice of burning the textile waste has serious consequences as “open-air burning releases toxins, acid gases, heavy metals and particles that are linked to respiratory diseases, cancer, heart disease and birth defects” (Walsh et al., 2023).

Moreover, the presence of piles of clothing in the desert has become a source of income to some of the population of Alto Hospicio. Individuals that struggle to find a more stable livelihood come rummaging through these piles, looking for items to sell. In a video-post on Instagram a local activist states that deals are struck between the those who come to dump unsold volumes of imported used clothing and those who search for valuables in these piles and burn the rest (Desierto Vestido, 2024). It is important to note that “searching often unattended landfills to find and collect potentially valuable materials - including textiles - to resell, waste collectors are exposed to a host of health risks, on top of the socioeconomic risks of informal labor. The level of exclusion and lack of protective measures for workers in direct contact with waste is higher than anywhere else in the informal economy” (Walsh et al., 2023).

3. POSITIONING

Having elaborated the problem field, the next step in framing the project is to define the position of the project within domain of urbanism as well as my position as an urbanist with respect to the locational context.

First and foremost, it is important to acknowledge that I am working on a project in a context that is foreign to me and where I am foreign. Considering my position as an outsider, I am aware of the inherent distance in my understanding of the local environmental, cultural and social dimensions related to the issue. To ensure adequate place sensitivity it is therefore crucial to do fieldwork, immersing myself in this local context to the extent of feasibility within the graduation project.

Specifically, there are a number of grassroots initiatives addressing the problematic situation regarding the clandestine landfills. The people involved in these activist efforts can potentially offer a deep and meaningful understanding of the environmental, social, political and economic implications and entanglements of the issue based on their experiences and local knowledge. Though, my intention is not only to learn from them, but also to position myself and my work as an extension of their efforts. Considering then, their much closer and more personal connection to the issue and far longer history of engagement, I realize that attempting to establish a collaboration requires from me as an outside researcher assuming an attitude of modesty, empathy and respect.

By approaching the local context and actors with modesty, empathy and respect, I aim to avoid any symptoms of a colonial approach, resulting in a disconnect between the paper project and local reality. This is particularly important given that the problem field includes issues of colonial tendencies. Thus, it is imperative to not add a third layer of colonialism to the existing two layers of waste colonialism and human colonization of the desert landscape.

However, approaching local reality with modesty, empathy and respect does not require a completely passive and hands-off approach, as this would mean to relinquish my agency as an urbanist. Rather, the intention is to operate the agency of the expertise of urbanism in synergy with local initiatives. In order to achieve this, it is in the first place necessary to learn from the experience and body of knowledge that exists in the local context. Then, informed by this, wielding the expertise of urbanism to generate a project offering an extension to the local body of knowledge, exploring and envisioning spatially what could be through the designerly ways of knowing that are intrinsic to the domain of urbanism.

In conclusion, the aim for the thesis is to develop a project that aids the activist efforts against the clandestine landfills by extending the related body of knowledge into the realm of urbanism. Ultimately, the project will also be contributing to the cause of activism as, in this context, the act of research in itself, is a form of activism.



Image 3.1: Local activists on a dumpsite
Source: Desierto Vestido on Instagram, 2024

4. RESEARCH FRAMEWORK

**Research questions / Conceptual framework
/ Theoretical framework / Methods /
Methodology overview**

4.1 Research questions

The main question of this thesis is derived from the problematization and positioning: How can spatial and non-spatial interventions regarding the issue of clandestine landfills demanded by activism-driven reshaping of urban-desert imaginaries restore environmental justice for human and more-than-human entities in Iquique and Alto Hospicio?

To answer this question a set of supportive research questions is posed as well as two theoretical questions that will be elaborated on in the theoretical framework, further defining the methodology of the thesis. The research questions are divided into two categories: 1) analytical questions, which serve to generate an extensive understanding of the local context and to understand spatial processes and social dynamics related to the issue; 2) a propositional question, which formulates the design objective for this thesis.

Theoretical

[TQ1] What is understood as environmental justice for human and more-than-human entities?

[TQ2] What is understood as an urban-desert imaginary?

Analytical

[RQ1] What is the extent of the damages to environmental justice for human and more-than-human entities caused by clandestine landfills?

[RQ2] How do urban-desert imaginaries from the past and present enable the proliferation of clandestine landfills? (Through which systems, infrastructures and networks?)

[RQ3] How is activism reshaping urban-desert imaginaries in Iquique and Alto Hospicio?

[RQ4] What actions, projects and strategies are being carried out by different actors in an effort to terminate the proliferation of clandestine landfills and restore environmental justice?

Propositional

[RQ5] How can spatial and non-spatial interventions to restore environmental justice regarding the issue of clandestine landfills be united into a coherent solution?

[RQ6] What does the application of the interventions with spatial implications look like in the context of Iquique and Alto Hospicio?

4.2 Conceptual framework

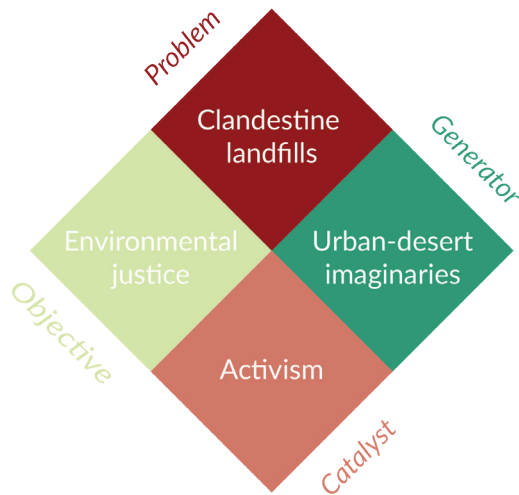


Image 4.1: Basic conceptual framework
Source: by author

The conceptual framework consists of four core elements. The first element is the problem, which are the clandestine landfills.

Then there is the element of urban-desert imaginaries, which functions as the generator in this framework. This functions should be interpreted in a dual sense. On the one hand, urban-desert imaginaries have played a crucial role in the generation of the current situation, where clandestine landfills contaminate the desert landscape. On the other hand urban-desert imaginaries are the proposed generator of change toward an alternative future scenario. This paradoxical duality is due to the fact that imaginaries are subject to a continuous process of alteration. Imaginaries are the combined image of perceptions and representations and these mutually influence each other. This makes them very powerful tool to reimagine future scenarios.

The third element is the catalyst, a role that is embodied by activism. The extensive exposure of the problem by activist initiatives is constantly adding to and changing the domain of representations. In reaction to this, perceptions will change at an increased pace. Thus, activism is catalyzing the function of the generator.

Finally there is the objective, environmental justice, which gives direction to the desired futures. It is crucial to understand that this direction needs to be, and is, an opposition to the problem. The objective is also directly related to the catalyst, which needs to be aligned in the same direction as the objective.

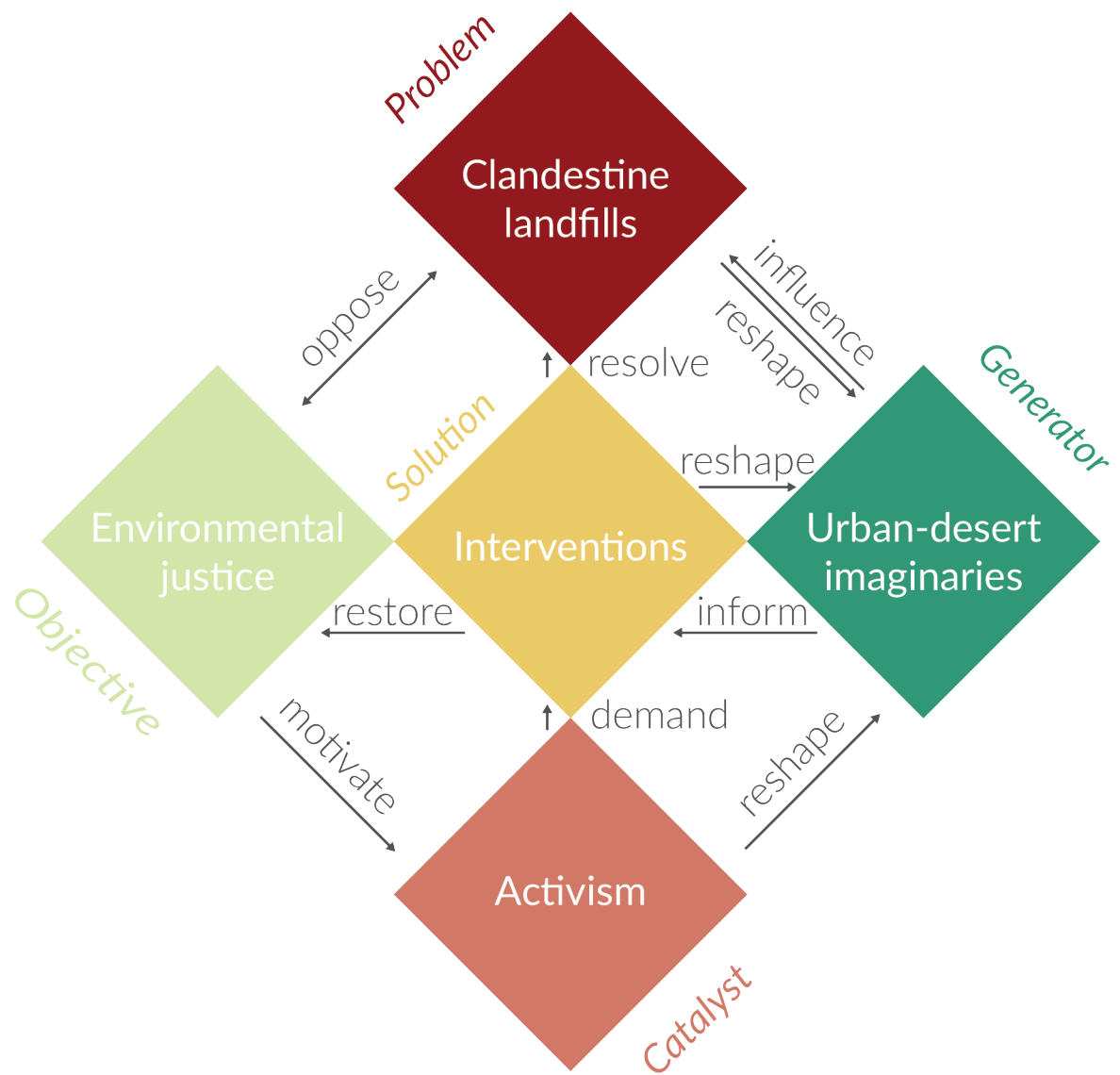


Figure 4.2: Elaborate conceptual framework
Source: by author

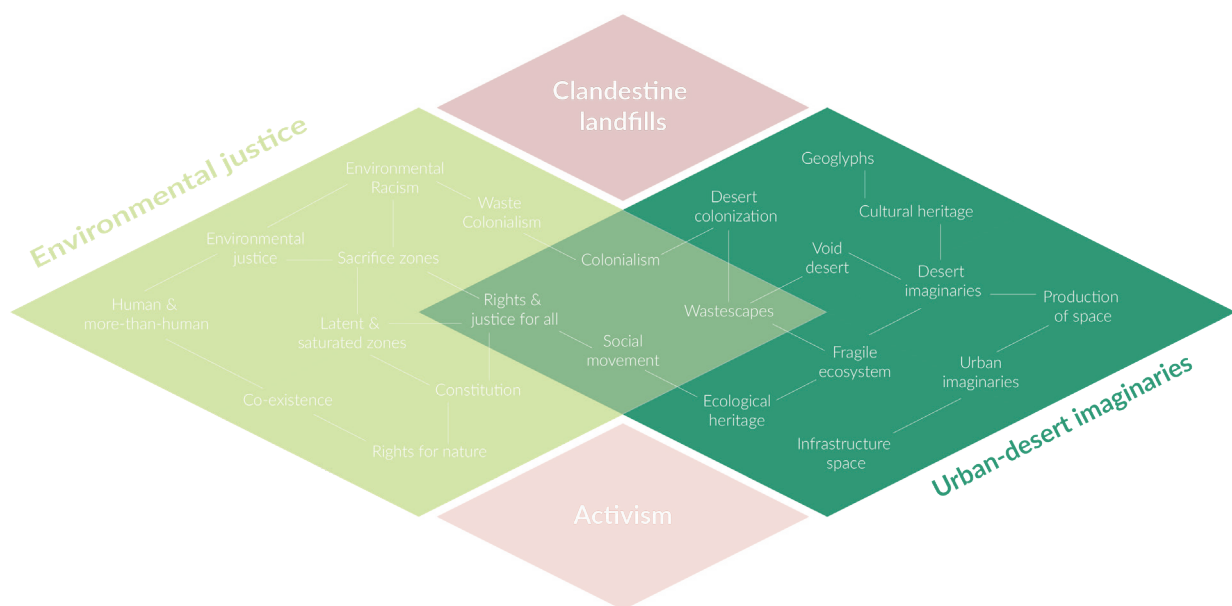


Image 4.3: Theoretical framework
Source: by author

4.3 Theoretical framework

In the theoretical framework for this project I will explore the meaning of the concepts of environmental justice and imaginaries as they both play a crucial role in the conceptual framework.

Defining Environmental Justice

The concept of Environmental Justice (EJ) originates from the mid second half 20th century in the context of the United States (Bullard, 1990; Murdock, 2021). In the battle against Environmental Racism, EJ is formulated in this way:

“Environmental justice embraces the principle that all people and communities have a right to equal protection and equal enforcement of environmental laws and regulations.”

by R.D. Bullard, widely considered the founding father of EJ. Thus it was meant to address the issue of situation practices of polluting industry and landfills targeting the communities of those least likely to succeed in resistance, resulting in an unfair distribution of environmental burdens within the society as a whole. In the United States context of 1970's-1980's, this meant the exacerbation of institutional racism by added environmental racism (Murdock, 2021).

EJ is considered as the fundamental human right to live, work and play in a clean, healthy, safe and sustainable environment. However, through the perspective of co-existing, elaborated by Donna Haraway, it becomes obvious that this right should not be applied exclusively to humans. Rather, it is to be considered a more-than-human right. As nature lives and works just as humans do in the place it exist, so does nature. Therefore, nature-inclusive environmental justice requires to safeguard that both human and more-than-human entities can live, work and play in a clean, healthy, safe and sustainable environment.

EJ as a movement: “Environmental justice is, importantly, a movement, which means that it starts and lives with the people: in the communities that are experiencing the harms and in the challenges environmental injustices enact in the places where community members live, work, and play. What this means is that, while environmental justice has intellectual and academic dimensions, it is primarily a grassroots and people-driven movement. In fact, an important principle of environmental justice that emerges from activist communities is the maxim: “We speak for ourselves” (Cole and Foster, 2001). The imperative “We speak for ourselves” privileges the voices, experiences, and expertise of those directly confronted with issues of environmental injustice. It is related to the idea that the community members experiencing the realities of environmental injustice should be the leaders of movements to liberate and heal their own communities. This does not mean that solidarity and coalition-building are not an important part of and strategy for achieving environmental justice. However, it does mean there are often difficult conversations about privilege, as well as important differences in backgrounds, histories, and resources.” (Murdock, 2020, p.8)

Contextualizing Environmental Justice in Chile

The movement of EJ in Chile is present in the overall social movement in Chile sparked in the spring of 2019. It also resonates with the appeals of indigenous peoples of Chile, like the Mapuche, reclaiming their rights to land and clean water, and more specifically the movement that is EJ, is present in the resistance against so called ‘Zonas de Sacrificio’.

Although the term Sacrifice Zone (SZ) is not an official term, either, in the Chilean legal framework, and there are therefore no official listings of such areas, there are generally five zones identified as SZ: Tocopilla, Mejillones - Región de Antofagasta, Huasco - Región de Atacama, Puchuncaví-Quintero - Región de Valparaíso and Coronel - Región del Bío Bío (Fundacion Terram, 2016). Each of these zones are presented with high levels of pollution, including heavy metals, emitted by large scale industrial sites for among others thermoelectrical facilities.

In spite of SZ not being a recognized legal term, the Chilean legal framework does permit the designation of Latent Zones and Saturated zones. Law No. 19,300 defines in Article 2: “t) Latent Zone: that in which the measurement of the concentration of pollutants in the air, water or soil is between 80% and 100% of the value of the respective environmental quality standard, and u) Saturated Zone: that in which one or more environmental quality standards are exceeded” (Retamal Maldonado et al., 2021). Designating areas as Latent Zone or Saturated Zone, thus, implies the permission to expose the concerning areas to higher levels of environmental contamination. This undermines the concept of EJ, and in fact also undermines the declaration in the vigilant 1980 Constitution, chapter III, article 19, No.8, ensuring for all persons: “The right to live in an environment free from contamination. It is the duty of the State to ensure that this right is not violated and to safeguard the preservation of nature.” (López et al., 2020). In order to accommodate for this contradiction, the designation of latent and saturated zones must be accompanied by plans for improvement (Retamal Maldonado et al., 2021). However, the fact that the same legal framework that claims responsibility for the state to protect the citizens of its nation from contamination also provides the declaration of what can best be described as a euphemism for a Sacrifice Zone perfectly demonstrates the complexity of the possibilities for legal protection of EJ -explicit or implicit of the exact term- in Chile.

The concept of a Sacrifice Zone, like to EJ, originates from the United States where it has been defined as a geographic sector of high industrial concentration, in which the establishment of industrial areas has been prioritized over the welfare of people and the environment (López et al., 2020). It illustrates the sentiment that progress requires sacrifice and some areas have to be sacrificed for the benefit of the common good. The unfairness of distribution of environmental burdens in SZ's is increasingly evident from the statement at the conclusion of country visit to Chile by United Nations Special Rapporteur on human rights and the environment, Dr. David R. Boyd (2023), wherein he describes Sacrifice Zones in Chile as areas “where marginalized and vulnerable communities suffer extreme exposure to toxic substances and environmental degradation.”

Relating Environmental Justice to Clandestine Landfills in Alto Hospicio

The practice of the burning and dumping of unsellable second hand clothing in the streets and outskirts of Alto Hospicio can be considered a clear example of environmental injustice based on the previous exploration of the concept of EJ.

In the general discourse on SZ's in Chile, Alto Hospicio is not mentioned. This can be explained by the fact that the problems here are caused by illegal activities, whereas the toxicity in official sacrifice zones results from authorized activities. However, the toxic and sacrificial nature of the problematics in Alto Hospicio align perfectly well with the concept of a SZ.

Existing concepts of imaginaries

In *The Production of Space*, Lefebvre argues that space is a social product, conceived through three moments of space: spatial practice or perceived space; representations of space or conceived space; spaces of representation or lived space (1992). In a very similar way, imaginaries are social constructs through which individuals and societies make sense of the world around them. They are produced through the act of imagining. These imaginings are based on perceptions of the live world as well as on representations and even on perceptions of these representations. Delving deeper, it should be noted that, representations are in themselves reflections of perception. As perceptions and representations interact, influence and respond to one another, imaginaries should thus be considered evolving constructs.

As imaginaries are a product of human imagination, they tend to be human centered. However, there are authors, such as Donna Haraway, that have elaborated on the possibilities of framing human perceptions and representations of the world through a more inclusive lens.

Urban imaginaries specifically are described as “the mental or cognitive mappings of urban reality and the interpretative grids through which we think about, experience, evaluate, and decide to act in the places, spaces, and communities in which we live” (Soja in Lindner and Meissner, 2018, p.6). They reflect how urban areas, ranging from public spaces such as squares to cities as a whole, are envisioned, experienced, and reproduced, capturing both the intangible and physical characteristics that define them. These constructs in turn influence urban planning and public policy, shaping the conditions of transformation and reproduction. Urban imaginaries are therefore reflective as well as prescriptive, guiding the development of urban areas in ways that align with certain visions of the future.

Meanwhile, desert imaginaries refer to the multitude of ways the space is constructed in the desert. In the Atacama the spatial main production appears to be that of empty space, leading to humans adopting an attitude of colonization (Meza Aliaga et al., 2024).

The synthesis of urban-desert imaginaries

In this thesis I employ the term urban-desert imaginary rather than either separate to expose the interrelations between the urban and the desert. The proposed synthesis of urban-desert imaginaries relates the interaction between the conceptual realm of urban imaginaries and desert imaginaries. This synthesis is particularly relevant in the context of extended urbanization in desert landscapes. In this, extended urbanization refers to territories where the process of urbanization profoundly alters the landscape beyond the immediate limits of the urban area.

Wastescapes (and sacrifice zones) are the product of urbanization, relating clandestine landfills in the desert landscape of Alto Hospicio to its urban image, through the concept of urban-desert imaginaries. The relation between urban and desert, in this case is further highlighted by the presence of improvised housing on the sites, indicating human inhabitation.

4.4 Methods

Literature review: I conducted literature review about the concepts of environmental justice and imaginaries, especially desert imaginaries and urban imaginaries and the synthesis of urban-desert imaginaries.

Reviewing documentation regarding clandestine landfills in Alto Hospicio and inflicted environmental damage: there is quite a lot of material including video documentaries, news articles and podcasts about this issue, reviewing it helped to generate a broad perspective on the causes and problems of the phenomenon.

Identifying and mapping of clandestine landfills and their chronological development through satellite images: Based on satellite images loaded into QGIS, I have drawn outlines of areas that are, or at least appear to be contaminated by discarded waste materials. Later, I was able to improve the accuracy of the map making use of datasets that were shared with me by Corporación Ciudades. Through the use of satellite imagery made available online by the ESRI wayback machine, I have made a visual overview of the development of time of two main clandestine landfills.

Spatial analysis and mapping of systems, infrastructures and networks: in order to spatialize the elements facilitating the existence of clandestine landfills in Alto Hospicio I have made a map relevant elements and subsequently generated an illustrated description of what these elements are, how they have developed and how they related to the issue of clandestine landfills.

Stakeholder analysis: an overview of actors involved in the current situation, will expose vulnerabilities, capabilities and potentials regarding the prospect of change in the status quo.

Online research including social media review: Guided by the knowledge obtained in previous research steps, especially the stakeholder identification, I did an online search reviewing policies as well as websites and social media accounts of private organization, (i.e. ZOFRI), civil institutions (i.e. the municipalities of Iquique and Alto Hospicio) and NGO's (i.e. Desierto Vestido) looking for specific efforts that contribute to the reshaping of urban-desert imaginaries and/or the termination of the proliferation of clandestine landfills and/or the restoration of environmental justice. Reviewing social media accounts I also encountered other relevant organizations, that I had before not heard of, thus providing me with new leads for further investigation.

Assisting online stakeholder gatherings: I assisted two online meetings where stakeholders gathered to discuss the progress made so far regarding the tackling of the issue of clandestine landfills. These meetings were directed at a broader public, including local civilians, wanting to know more about the issue and advances regarding a solution. These were very useful as several stakeholders gave concise presentations summarizing their efforts, which is precisely the information I was looking for.

Site visit and ethnographic approach: I went to Iquique and Alto Hospicio, with the intention to visit one or more of the landfills to have a first-hand impression of the scale and gravity of these places, also I intend to gain insights in attitudes, perspectives and opinions of local people.

Expert interviews: I conducted three semi-structured interviews local experts on the topic., which provided me with an understanding of the problem and ways to proceed in the process to terminate the proliferation of clandestine landfills and restore environmental justice.

Pattern language: I constructed a pattern language by listing and categorizing spatial and non-spatial interventions based on previous research and/or inspired by fieldwork observations.

Application of the pattern language on the case: First, I selected patterns with spatial implications. For these patterns I defined relevant spatial criteria that indicate the applicability of each selected pattern. Based on analytical maps of the defined spatial criteria I then mapped the adequate application of selected patterns according to the indication of the mapped spatial criteria.

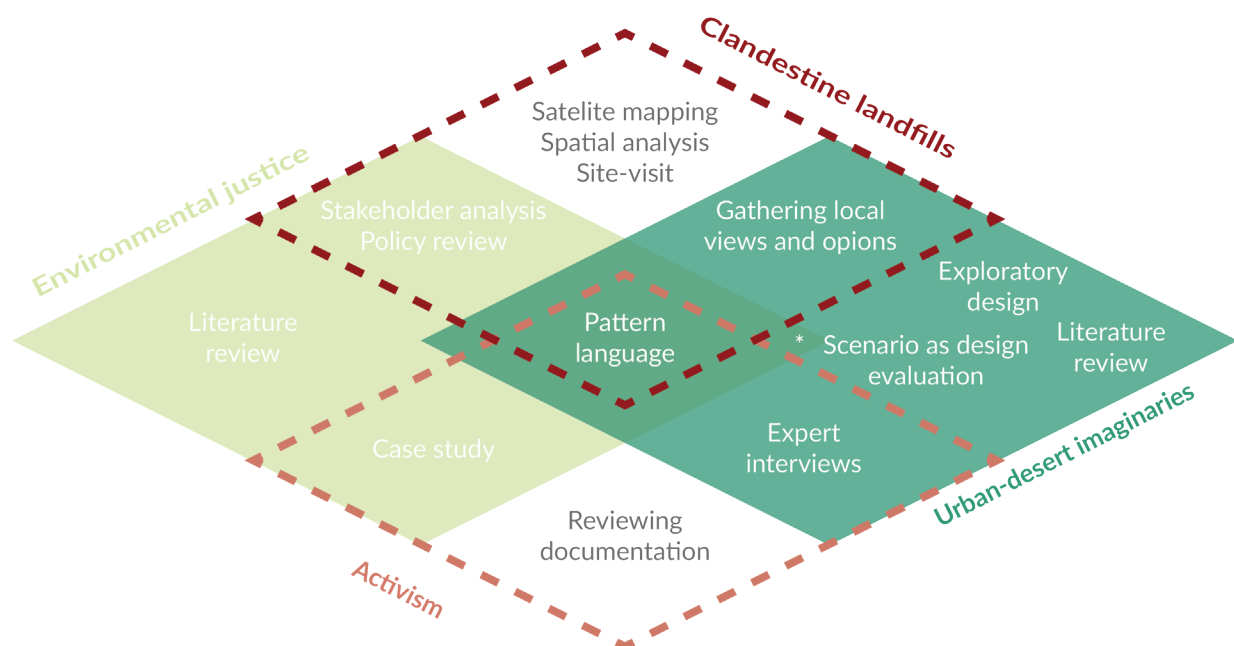


Image 4.4: Methods
Source: by author

4.6 Methodology overview

Research question

Subquestions

How can spatial and non-spatial interventions regarding the issue of clandestine landfills demanded by activism-driven reshaping of urban-desert imaginaries restore environmental justice for human and more-than-human entities in Iquique and Alto Hospicio?

Analytical

[SQ1] What is the extent of the damages to environmental justice for human and more-than-human entities caused by clandestine landfills?

[SQ2] How do urban-desert imaginaries from the past and present enable the proliferation of clandestine landfills? (Through which systems, infrastructures and networks?)

[SQ3] How is activism reshaping urban-desert imaginaries in Iquique and Alto Hospicio?

[SQ4] What actions, projects and strategies are being carried out by different actors in an effort to terminate the proliferation of clandestine landfills and restore environmental justice?

Propositional

[SQ5] How can spatial and non-spatial interventions to restore environmental justice regarding the issue of clandestine landfills be united into a coherent solution?

[SQ6] What does the application of the interventions with spatial implications look like in the context of Iquique and Alto Hospicio?

Methods

Output

Identifying and mapping of clandestine landfills and their chronological development through satellite images

Map locating clandestine landfills

Reviewing documentation regarding clandestine landfills in Alto Hospicio and inflicted environmental damage

Visual overview of landfill growth over time

Spatial analysis and mapping of systems, infrastructures and networks

Map of relevant systems, infrastructures and networks + description per element

Stakeholder analysis

Stakeholder overview + power diagram

Online research including social media review

Policy review

Initial catalogue of efforts against the proliferation of clandestine landfills

Assisting online stakeholder gatherings

Site visit and ethnographic approach

Photo report

Expert interviews

Summary of interviews and conversations

Listing and categorizing spatial and non-spatial interventions based on previous research and/or inspired by fieldwork observations

Pattern language for the restoration of environmental justice regarding the issue of clandestine landfills

Selecting patterns with spatial implications

Defining relevant spatial criteria that indicate the applicability of each selected pattern

Overview of patterns with spatial implications and relevant spatial criteria

Mapping the defined spatial criteria

Set of maps of spatial criteria analysis

Mapping the adequate application of selected patterns according to the indication of the mapped spatial criteria

Pattern application map on city scale

PART B - FINDINGS

5. MAPPING THE STATUS QUO

Situating Iquique and Alto Hospicio / Locating landfills / Infrastructures, systems and networks / Cataloging efforts against landfills

Situating Iquique and Alto Hospicio

Iquique and Alto Hospicio are two communes in the province of Iquique, in the region of Tarapacá in the north of Chile.

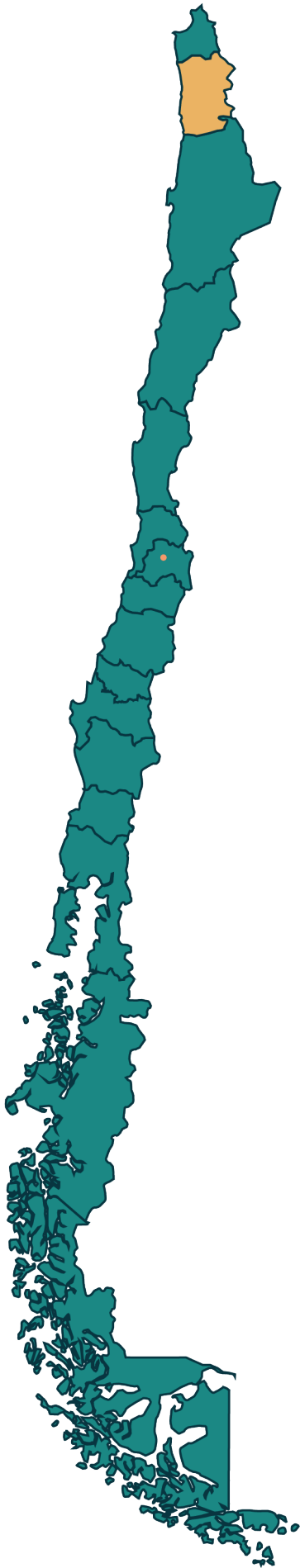


Image 5.1: Regions of Chile, highlighting Tarapacá
Source: by author

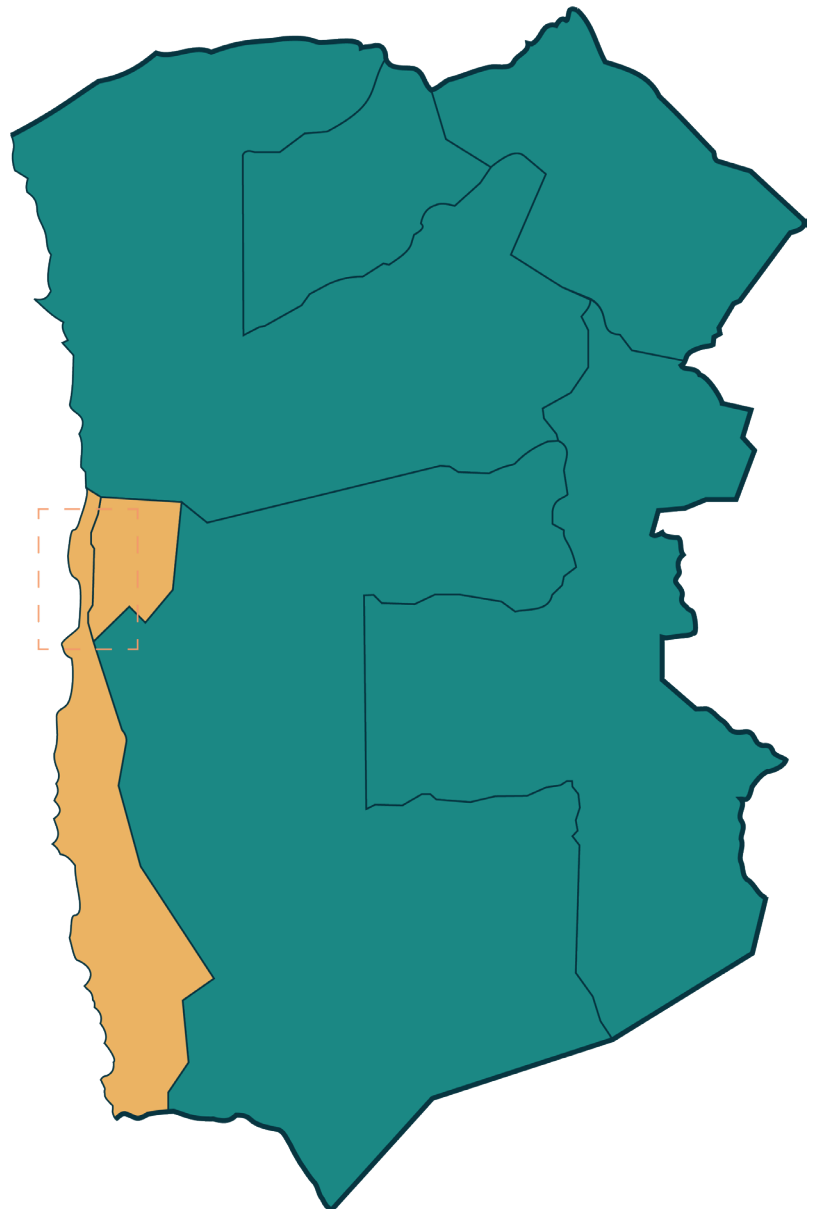


Image 5.2: Region of Tarapacá, highlighting the province of Iquique
Source: by author



Image 5.3: Satellite image of Iquique and Alto Hospicio
Source: Google Earth

0 10 20 km N
|

Geomorphology and climate

Iquique is located on the littoral area by the Pacific ocean. Alto Hospicio is located on the 600 meter tall cliff.

This cliff stops the Camanchaca, a natural phenomenon of dense marine fog at the northern Chilean coast, from entering further land inward. Although the the Camanchaca does not cause rain, it does provide humidity fostering life in the dry climate of the Atacama desert (Punta Patache, Iquique Podcast - Loquis, n.d.).

The aridness of the location exacerbates the environmental damage of the clandestine landfills, as textiles in this climate do not degrade as they normally would and will linger for an much longer period of time.



Image 5.4: A view of Iquique and Alto Hospicio
Source: Merino / Bloomberg, 2023

CROQUIS GEOMORFOLOGICO

IQUIQUE - CALETA MOLLE

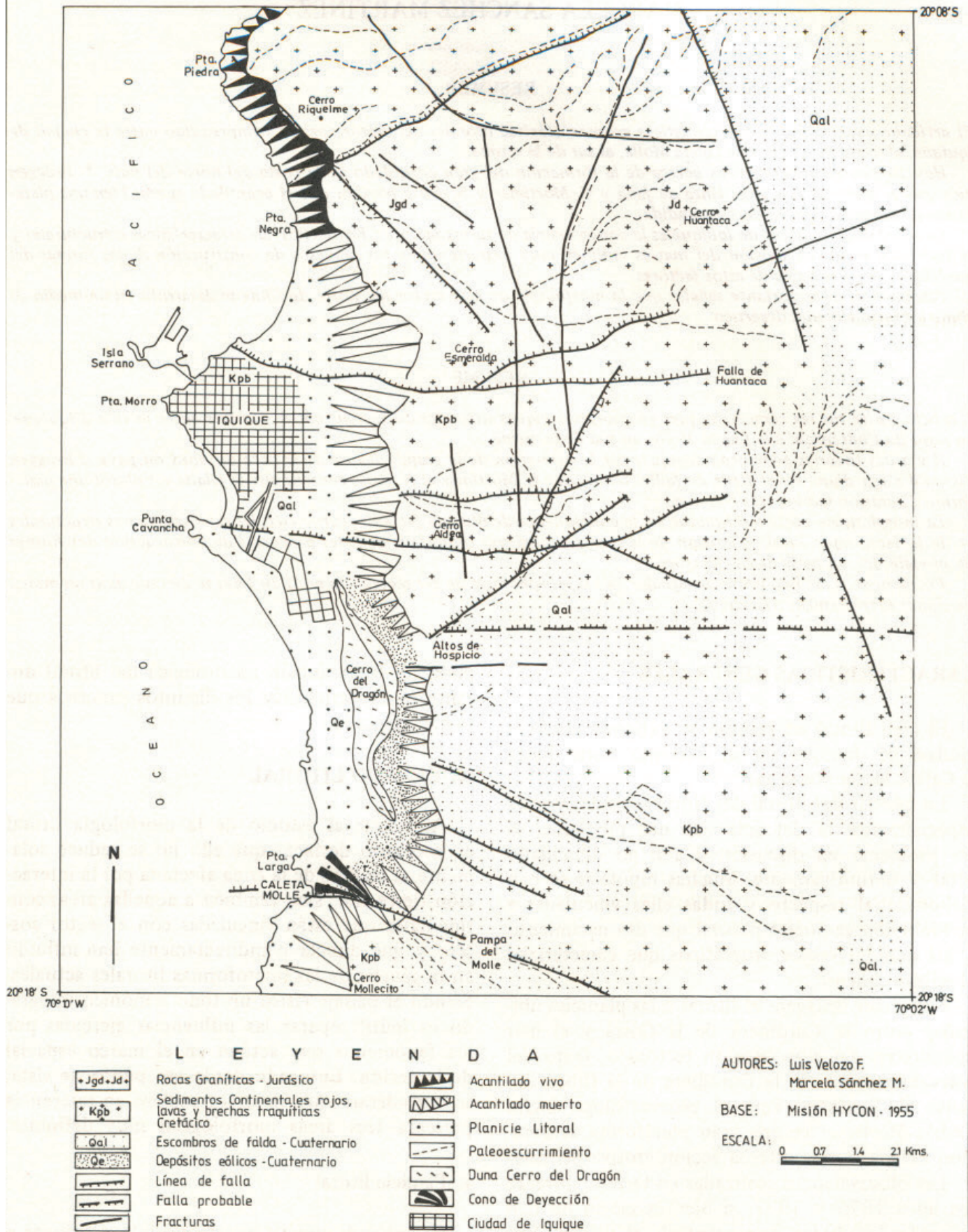


Image 5.5: Geomorphology
Source: Veloz & Sanchez, 1991



Image 5.6: scars from micro dumps at Cerro Dragón
Source: (Consejo de Monumentos Nacionales de Chile, n.d.)



Image 5.7: urban indent at the base of Cerro Dragón
Source: (Consejo de Monumentos Nacionales de Chile, n.d.)



Image 5.8: sportfields at Cerro Dragón
Source: (Consejo de Monumentos Nacionales de Chile, n.d.)

Protected nature

In the region of Tarapacá there are three areas of protected nature. These areas are declared as natural heritage by the Consejos de Monumentos Nacionales de Chile which operates under the Ministry of Bienes Nacionales. The only one of the three natural monuments in Tarapacá located within the area of interest of this study is the Santuario de la Naturaleza Cerro Dragón.

The Cerro Dragón is a large coastal sand dune located in a mostly rocky coastal landscape. This geomorphological monument was declared a sanctuary in 2005. It is approximately 4 kilometers long and 150-500 meters wide covering an area of 337.53 hectares. Its shape resembles a sleeping dragon, which inspired its name.

In spite of its protected status, this site has been victim of illegal disposal of waste in micro dumps. These dumps have been cleaned up by the municipality of Iquique, which is responsible for the caretaking of the sanctuary. However, even after clean up, these micro dumps have left significant scars on the otherwise smooth surface of the sand dune.

Moreover, it should be noted that the outline of the protected area has a rather irregular shape with chunks cut out at the western edge. This is the result of urban growth and development eating away at the base of dune, before the establishment of its protected status.

Even within the perimeter of the protected area there are several sports fields located affecting the integrity of the natural beauty of the sand dune.

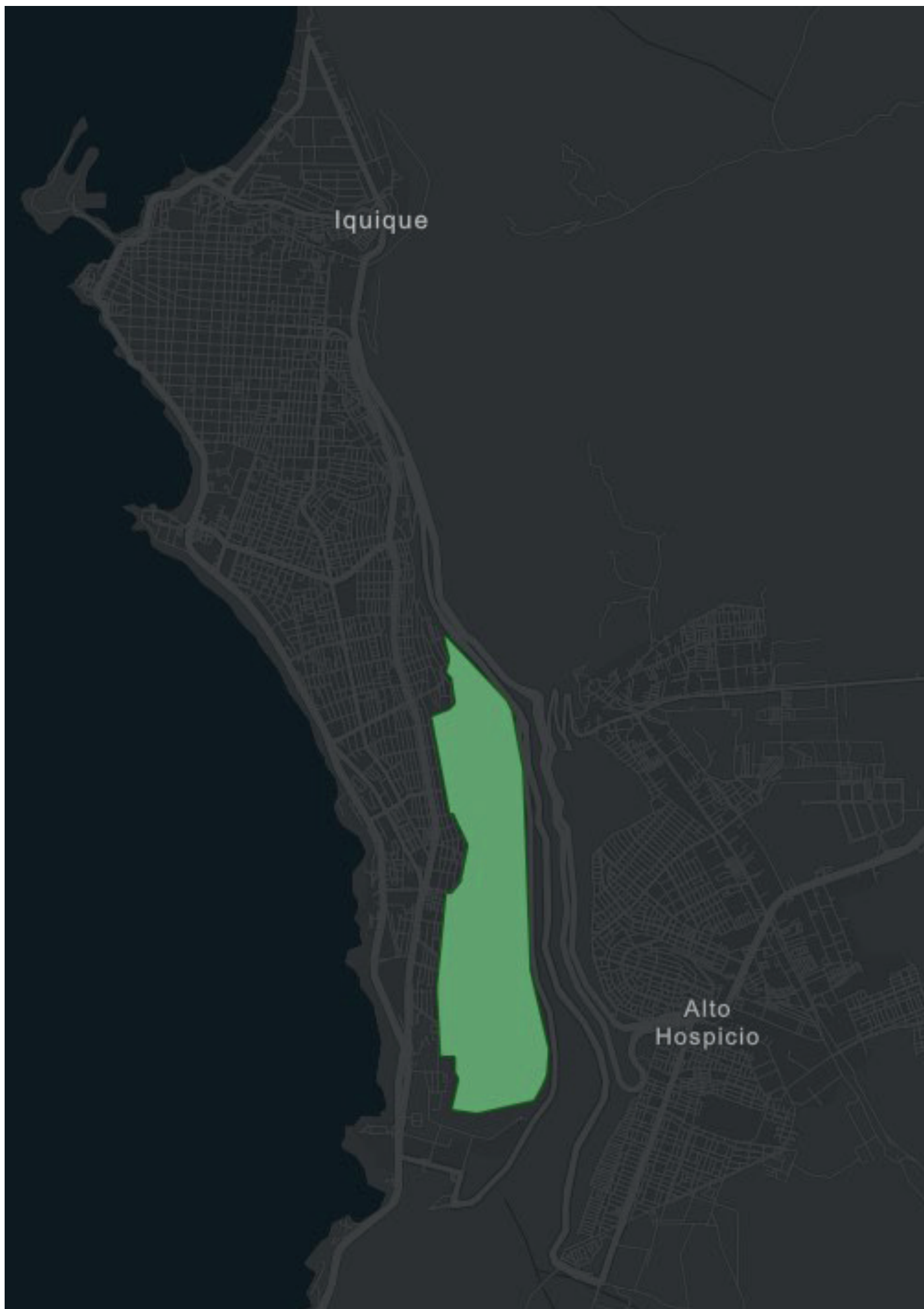


Image 5.9: Santuario de la Naturaleza Cerro Dragón protected area
Source: (Corporación Ciudades, 2023)

The relation between Iquique and Alto Hospicio



Image 5.10: Logo Municipality of Iquique
Source:

The stories of Iquique and Alto Hospicio are tightly interwoven. As the port city of Iquique grew due to economic prosperity from trade activities, Alto Hospicio developed as a residential area accommodating the overflow population from Iquique. This concerned especially low-income families seeking more affordable housing. The result was a rapid population growth in Alto Hospicio, in part due also to flows of immigration attracted by the economic prosperity of the port and free zone city of Iquique, but immigrants cannot afford housing in Iquique either, so move to live up in Alto Hospicio. This rapid population growth led to the emergence of many informal settlements in Alto Hospicio, a movement also reinforced by ideologies presented during the Estadillo in 2019, massive protests in Chile demanding a more dignified way of life, including accessibility to basic needs, including housing, education and health care.

On the 12th of April 2004, Alto Hospicio was founded as an independent municipality.

Because the territory of the young municipality Alto Hospicio previously belonged to the municipality of Iquique, the municipality of Iquique had always discarded its waste in the municipal landfill, located in the north of Alto Hospicio, Vertedero El Boro. When Alto Hospicio was founded as an individual municipality, Iquique no longer had a landfill facility within its territory and continued to use the landfill located in Alto Hospicio. Even now that the Vertedero El Boro has been closed and all waste disposal is referred to a new sanitary landfill, also located in Alto Hospicio further northeast, Iquique continues to bring its waste up to Alto Hospicio.

Recently the relation between Iquique and Alto Hospicio has been reinforced by the declaration of Iquique-Alto Hospicio as an Area Metropolitana, administrated by the government of the Tarapacá region.



Image 5.11: Logo municipality of Alto Hospicio
Source:



Image 5.12: A view of Iquique and Alto Hospicio
Source: Merino / Bloomberg, 2023

Locating landfills

Overview of landfills in Alto Hospicio

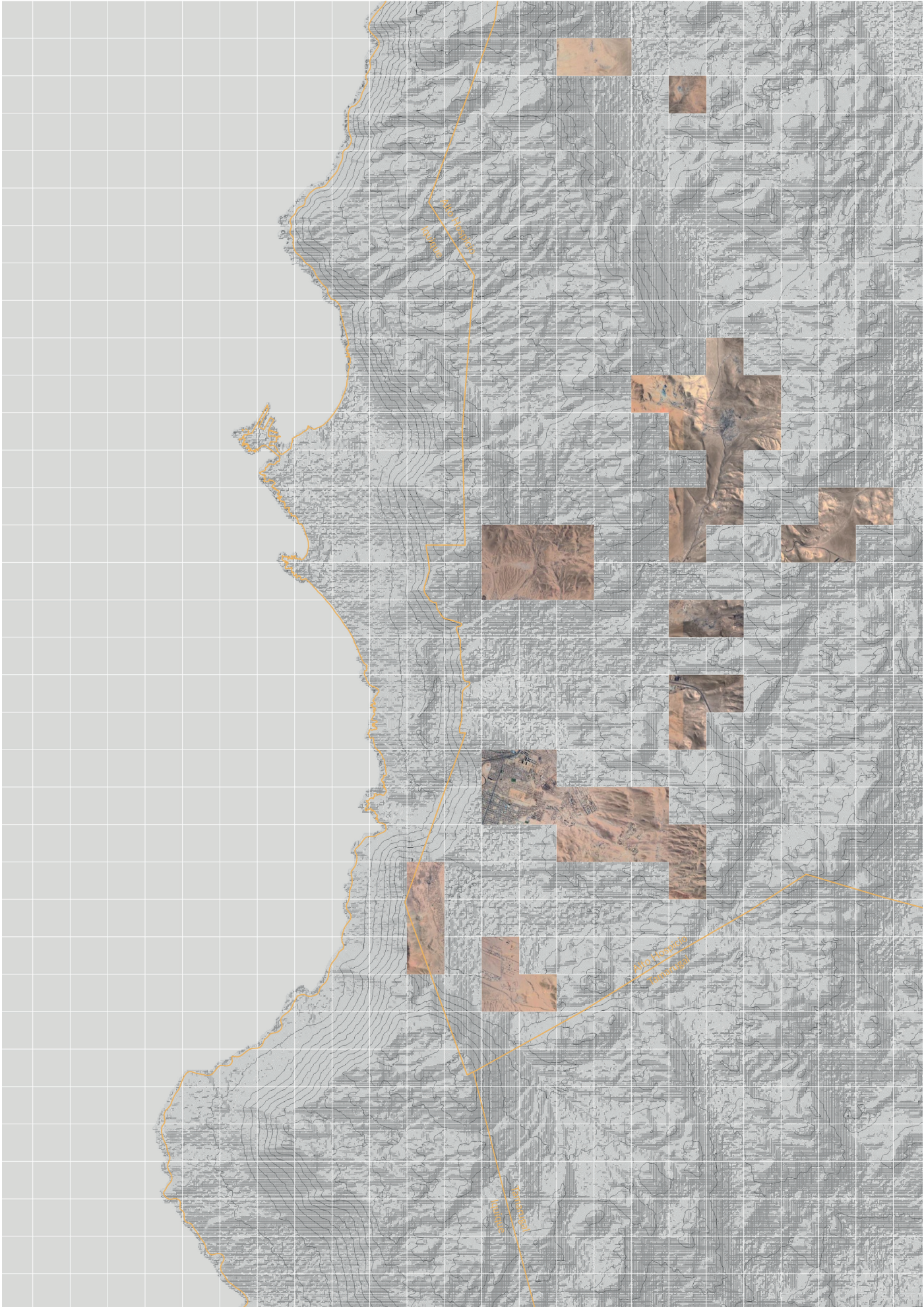
Territory divided up in squares of 10x10 km. In the square where landfills are present the satellite image is projected. The backdrop is a terrain map composed of a hillshade with heigth contour lines.

Source: by author

— Municipalty boundary

0 10 20 km

N
|



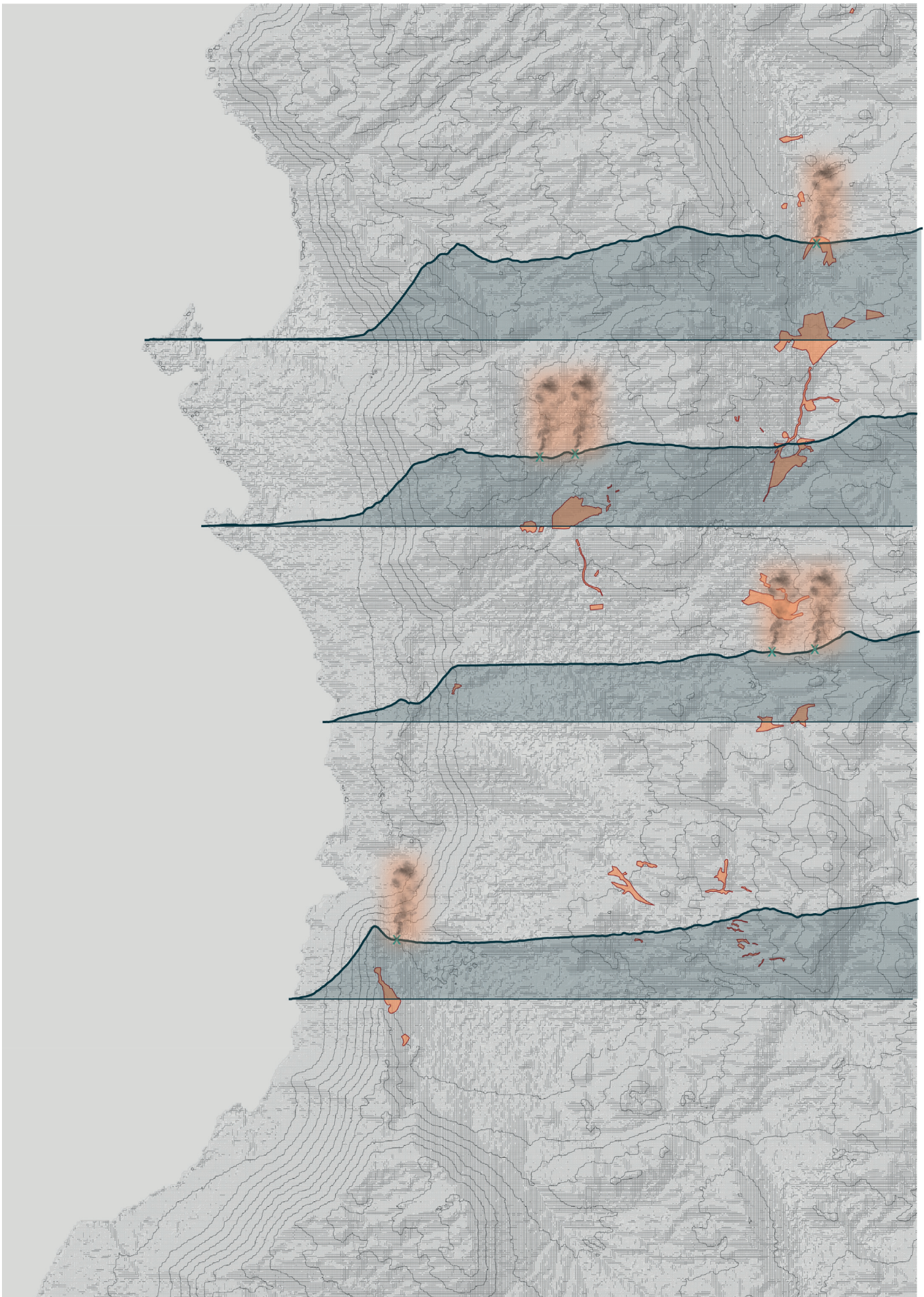
Landfills on profile projection

This map presents a projection of terrain profiles, indicating the location of landfills, hidden between in height differences in the landscape. The backdrop is a terrain map composed of a hillshade with height contour lines and the contours of the landfills projected onto the terrain.

Source: by author

 Landfill

0 10 20 km N
|





2014 2017 2019 2020 2021 2021 2022 2023 2024

Landfill Mollecita

Mollecita is one of the biggest and best documented landfills in Alto Hospicio. It is located near the informal settlement Toma Paso de la Mula, where about 90% of the population is not registered (Cooperativa.CI, 2023).



Image 5.13: Clandestine landfill Mollecita

Source:



Image 5.14: Fire at Mollecita Landfill 21 June 2021

Source: Cheng Hwa / Grist, 2024

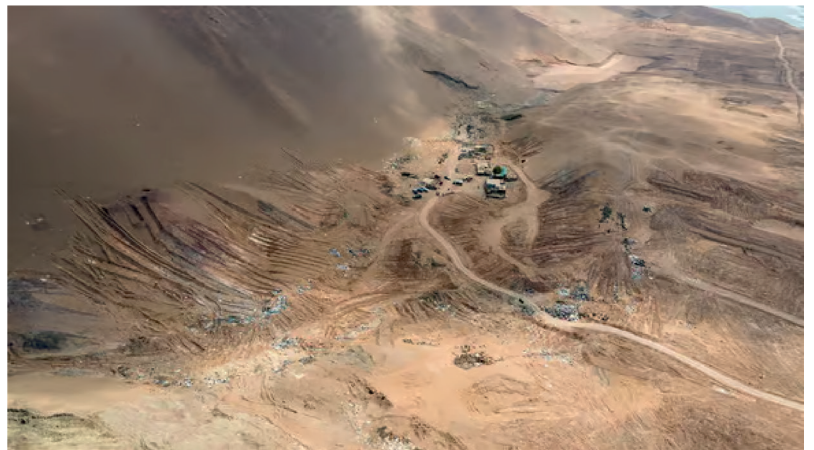


Image 5.15: Mollecita 'clean-up' aftermath

Source: 1TA, 2022



2014



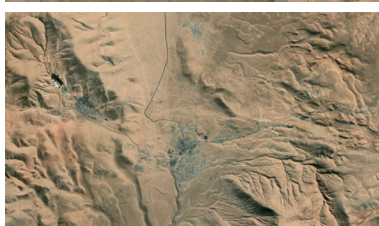
2017



2019



2020



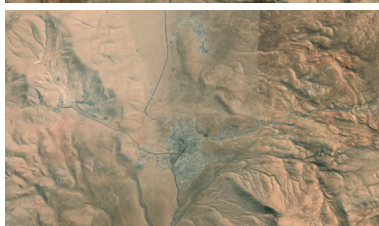
2021



2021



2022



2023



2024

Landfill Pampa Norte

Pampa Norte is one of the biggest and best documented landfills in Alto Hospicio. It is located to the North East of the urban area of Alto Hospicio. The affected area is mostly covered in ashes, such that it is popularly known as sector *Las Quemadas* - the burnings.



Image 5.16: Pampa Norte Primer Tribunal Ambiental on site-visit
Source: 1TA, 2023



Image 5.817 Pampa Norte smoldering residues
Source: 1TA, 2023



Image 5.18: Pampa Norte drone footage residues
Source: 1TA, 2023

Infrastructures, systems and networks



Image 5.19: Port of Iquique
Source: Arbea, 2022



Image 5.20: La Quebradilla open air market
Source: Es de Iquiqueños, 2021



Image 5.21: ZOFRI importer used clothing storage
Source: Maggioni, 2024 (timestamp -30,37)

Spatial structure

This map demonstrates the spatial structure of the infrastructures, systems and networks that have thus far facilitated the proliferation of the clandestine landfills. The backdrop is a terrain map composed of a hillshade with heighth contour lines.

Source: by author

- ZOFRI
- La Quebradilla open air market
- Landfills
- Port of Iquique
- Road network



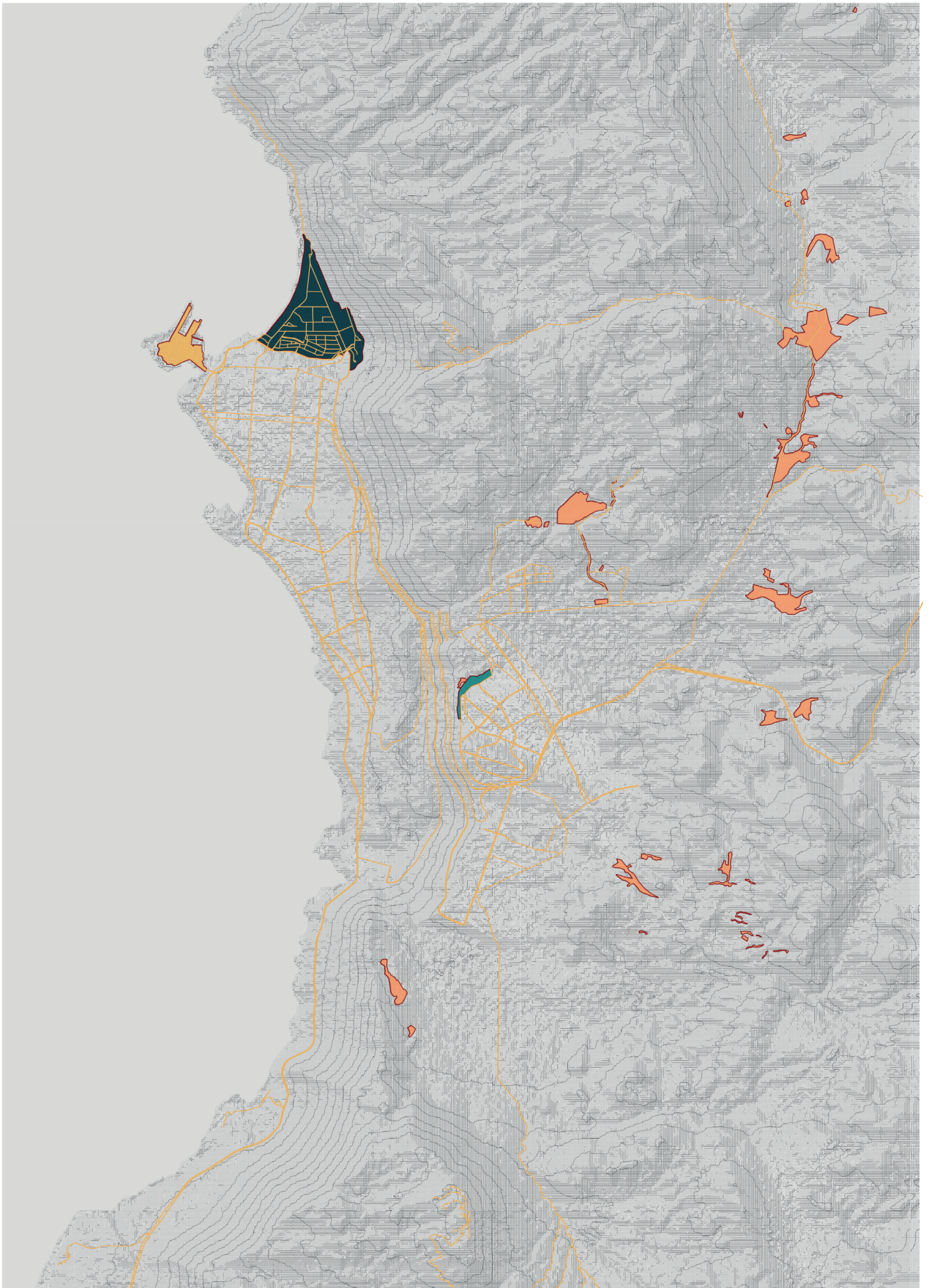




Image 5.22: Vision for teleférico connection
Source: Ministerio de Obras Publicas, 2025



Image 5.23: Intended trajectory for teleférico
Source: Ministerio de Obras Publicas, 2025



Image 5.24: Visual for future teleférico station
Source: Ministerio de Obras Publicas, 2025

Road network

Due to the geographical circumstances the vial connection between Iquique and Alto Hospicio are few. The main uphill connection, the ruta A16, starts from round about marked by the Al Pampino monument, making this the primary entry point to Iquique from Alto Hospicio. Heading down, the ruta A16 can be accessed via a zigzagged descend at the extension of the A-616 in the north of Alto Hospicio, as well as the main entry of ruta A16 into Alto Hospicio, just south of the the citys central district. Arriving in Alto Hospicio the ruta A16 continues to the west where it connects to national main route 5 at Humberstone, a historical salitrera town. Route 5 reaches south all the way to Santiago, and further north to Arica. From Iquique this is the only way north as there is no littoral alternative. Running south from Iquique there is a coastal road, which leads to the airport some 30km down the road and all the way down to Antofagasta.

In 2019, a secondary uphill connection was opened with its main connection point in Iquique at the end of the Avenida Tadeo Haenke, which passes by the Stadium Tierra de Campeones. In Alto Hospicio this secondary access roads enters at the Paso de la Mula, which is the border between the so far urbanized area and ongoing further urbanization towards the south.

In addition to these vial connections between Iquique and Alto Hospicio, there are plans for a teleférico, cable car service. The call for tender was published in 2025 and the teleférico should be operational as of 2060. The trajectory will be 5,7 kilometers long and include three stations, two in Iquique and one in Alto Hospicio. The cars with a capacity of 10 people will move at a speed of approximately 22 km/h, resulting in a 16 minute transfer from between end stations.

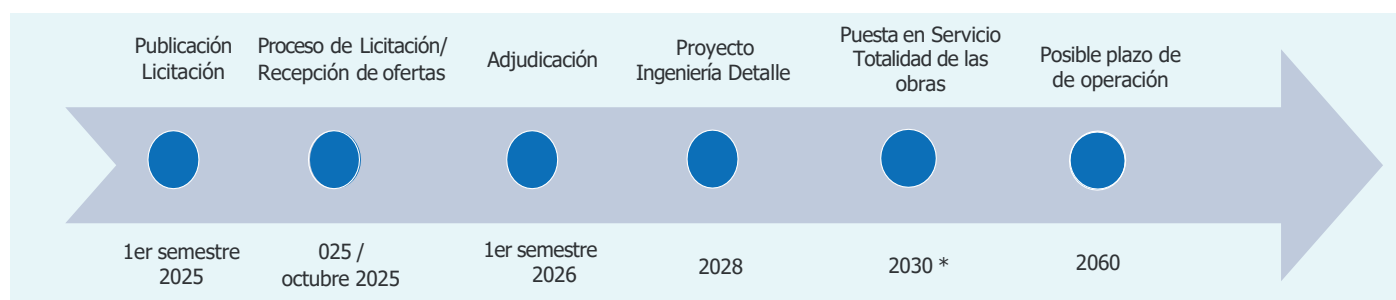


Image 5.25: Timeline project development teleférico
Source: Ministerio de Obras Publicas, 2025



Image 5.26: View over secondary access for primary uphill access
Source: by author

Cheap offshore production
-> market manipulation
-> cheap labor

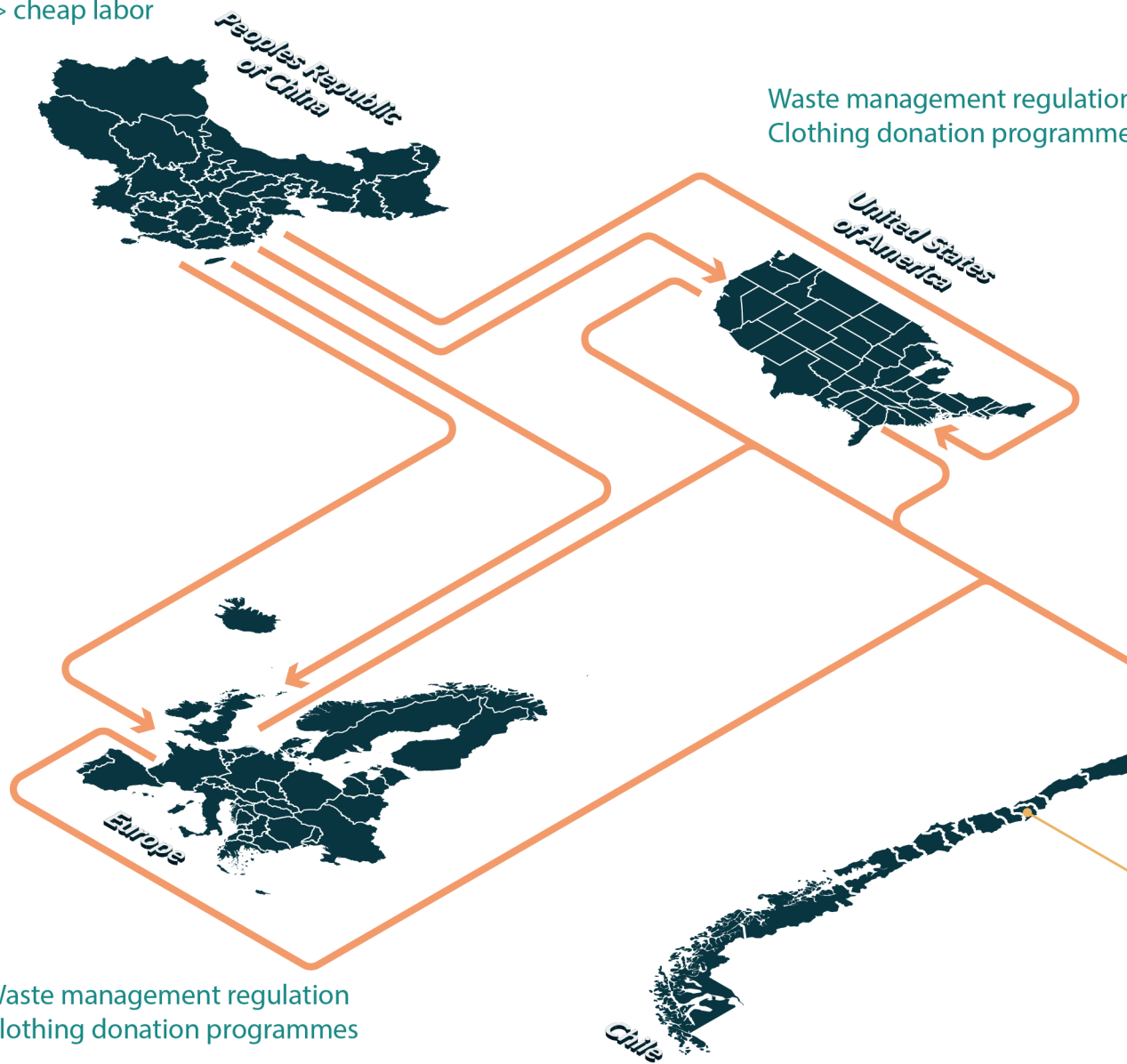


Image 5.27: Institutional and regulatory infrastructures
Source: by author

Municipio de Iquique
Alcalde: Mauricio Soria Macchiavello

ZOFRI S.A.

Zona Franca

Iquique

Alto Hospicio

Clean up actions

Municipio de Alto Hospicio
Alcalde: Patricio Hereira

Tarapacá

Gobierno Regional de Tarapacá

Portecion Medio Ambiente

Santiago

Gobierno Chileno:

- Ministerio de Economía, Fomento y Turismo
- Ministerio de Relaciones Exteriores
- Ministerio de Vivienda y Urbanismo
- Ministerio del Medio Ambiente
- Ministerio de Bienes Nacionales



Image 5.28: ZOFRI Mall main entrance
Source: ZOFRI.cl

Zona Franca Iquique - ZOFRI

The establishment of the ZOFRI was the state response to the demographic and geopolitical need for a strong hub of social and economic development in the far north of Chile. To achieve this, a law was passed in 1969 allowing the genesis of free zones in Chile. Then in the beginning of 1973, under the presidency of Salvador Allende the Sociedad Administradora y Operadora de Zonas Francas S.A. (Free Zone Administration and Operating Company S.A.) was established. ZOFRI began its first operations in 1975. In 1990, the administrative structure of the management of the Free Zone was revised and a 40 year concession contract given to the ZOFRI S.A., which is a private company, although the majority of the shares are state owned.

Currently ZOFRI consist of several operational elements. Its primary site in the north of Iquique includes a logistical center for wholesale business, walled premises I and II, an industrial strip, and the ZOFRI Mall, which is the largest shopping center in Iquique, where the general public can buy goods free of taxes.

Additionally, ZOFRI S.A. manages an industrial park in Arica.

In 2012 ZOFRI began a project to expand its operational area to Alto Hospicio where it established a condominium in 2018, called Parque Empresarial ZOFRI Alto Hospicio, PEZAH. The first 66 hectares of the 120 total available have so far been developed, leaving still plenty of space for further development.



Image 5.29: PEZAH, Alto Hospicio
Source: ZOFRI.cl



Image 5.30: PEZAH in Alto Hospicio
Source: ZOFRI.cl



Image 5.31: Primary site ZOFRI, Iquique
Source: Radio Paulina

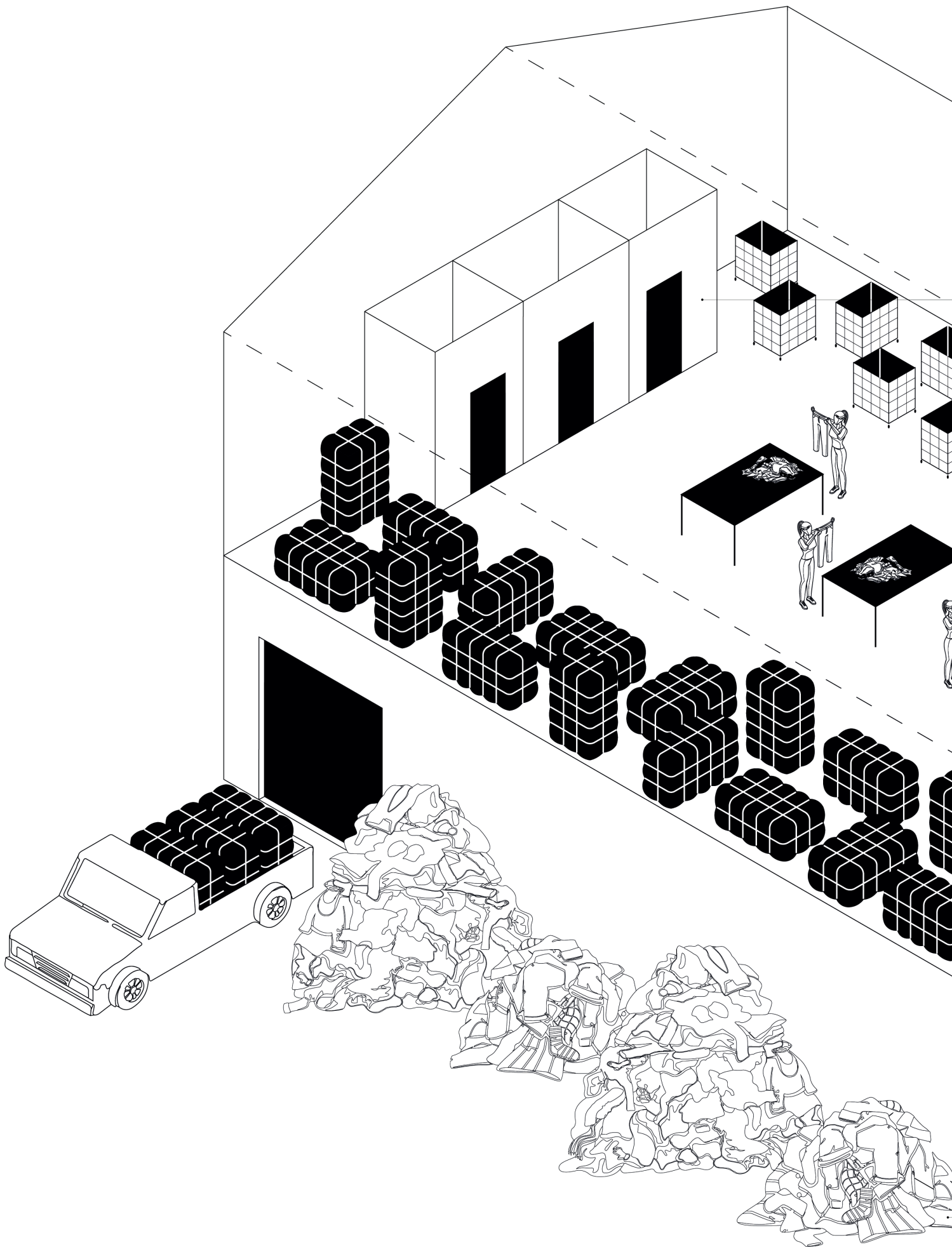
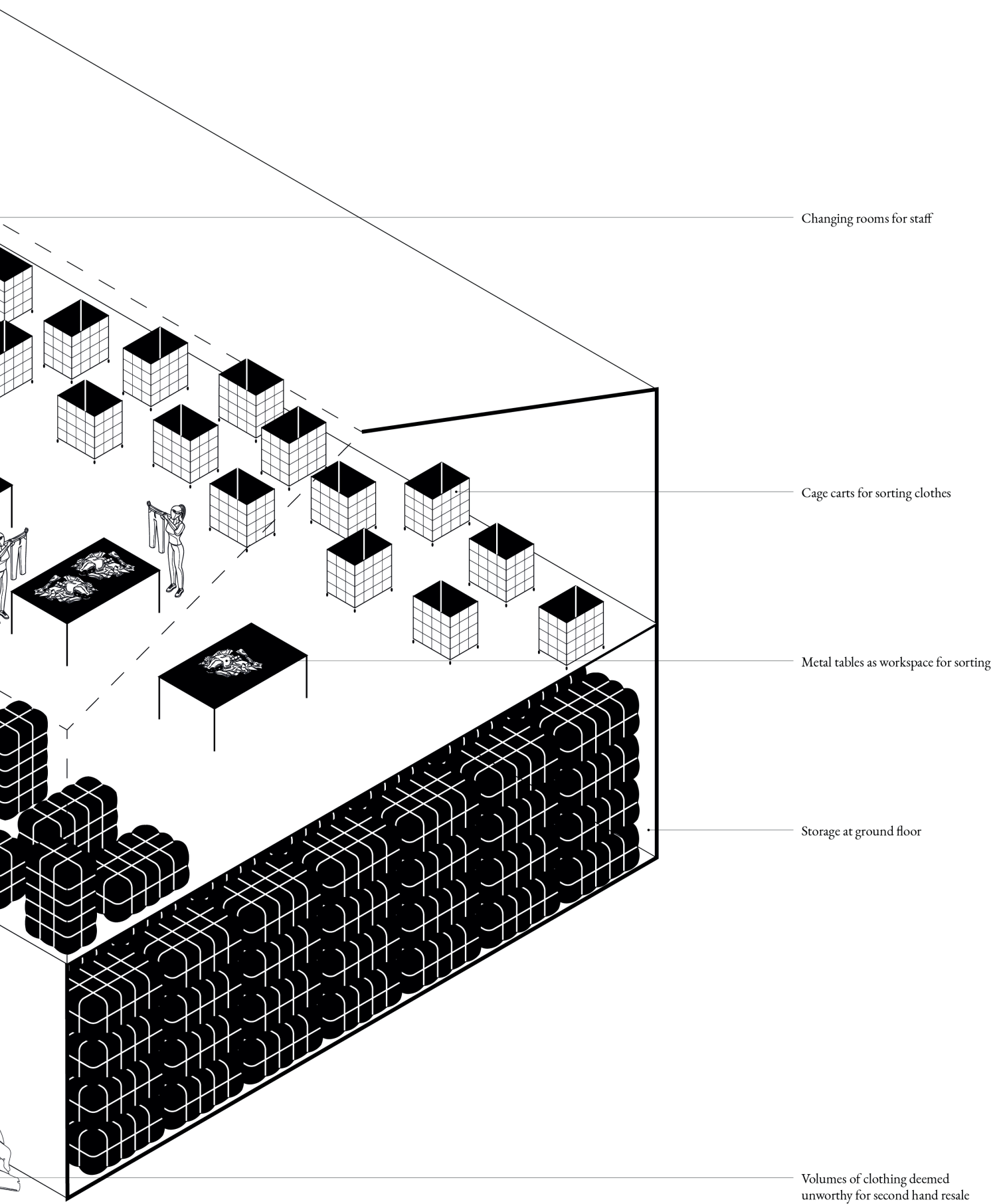


Image 5.32: Axonometric drawing of a used clothing sorting facility
Source: by author



La Quebradilla

La Quebradilla is an open air market at the edge of the central district of Alto Hospicio. The market is known for its low prices and diversity in product offer including everything from fruits and vegetables to clothes, both new and second-hand, as well as videogames and car parts. It operates from Tuesday to Sunday, with Fridays and the weekend being the busiest days when the largest number of both merchants and visitors appear.



Image 5.33: La Quebradilla open air market
Source: Es de Iquiqueños, 2021

The retractable mostly blue canopies that protect people and goods from the sun mark the 3x3m stalls that extend for over more than one kilometer, and a width ranging from forty to one hundred meters. The plot is owned by the Housing and Urban Development Service (SERVIU), which upon request from the municipality of Alto Hospicio issued an official notice transferring administration of the site to municipal supervision.

Established in 2012, *La Quebradilla* owes its name to its location on top of former canyon – or *quebrada* – that has been filled up, first by inhabitants disposing garbage, debris, disused appliances, dead animals and many other organic and inorganic objects into the depths of the canyon, and subsequently by the municipality moving soil with the objective of creating an esplanade to accommodate the new market.

Originally the market was organized in three parts each administrated by a trade association registered with the Ministry of the Economy. The relocation of other associations from elsewhere in the city led to an expansion of the market area onto a shorter, elevated esplanade, to the southwest of the parking lot previously understood as the western limit of *La Quebradilla*. The associations are in charge of assigning the stalls to merchants. There are partner stallholders who pay the Municipality of Alto Hospicio a permit of CLP 16,000 per month for a spot. Any stalls left unoccupied by the regular stallholder at 08:30hrs will then be assigned to the temporary stallholders who signed up the day before and rent stalls for CLP 2,000 per day.

The lack of a central administration means that there is an higher need for presential supervision in comparison to other market spaces in the city that do have a central administration, such as the *Terminal Agropecuario AGROHOSPICIO* and the *Gran Feria*. This need is fulfilled by a small container office occupied by three municipal officers in charge of receiving permit payments, ensuring that aisles are kept clear, resolving disputes between vendors, and monitoring for potential safety issues.

Furthermore the municipality takes care of daily cleaning, occasional earthmoving, the salary of municipal employees in the field and watering, both of the planters on the banks and of the soil surface, which reduces the dust in suspension. These costs are not covered by the income from granted commercial permits, highlighting the social approach from the municipality, recognizing the value and importance of *La Quebradilla* in the local economy and culture.

Sources: (Osterling Dankers & González-Pavicich, 2019) (Villegas, 2020) (UNECE, 2024)

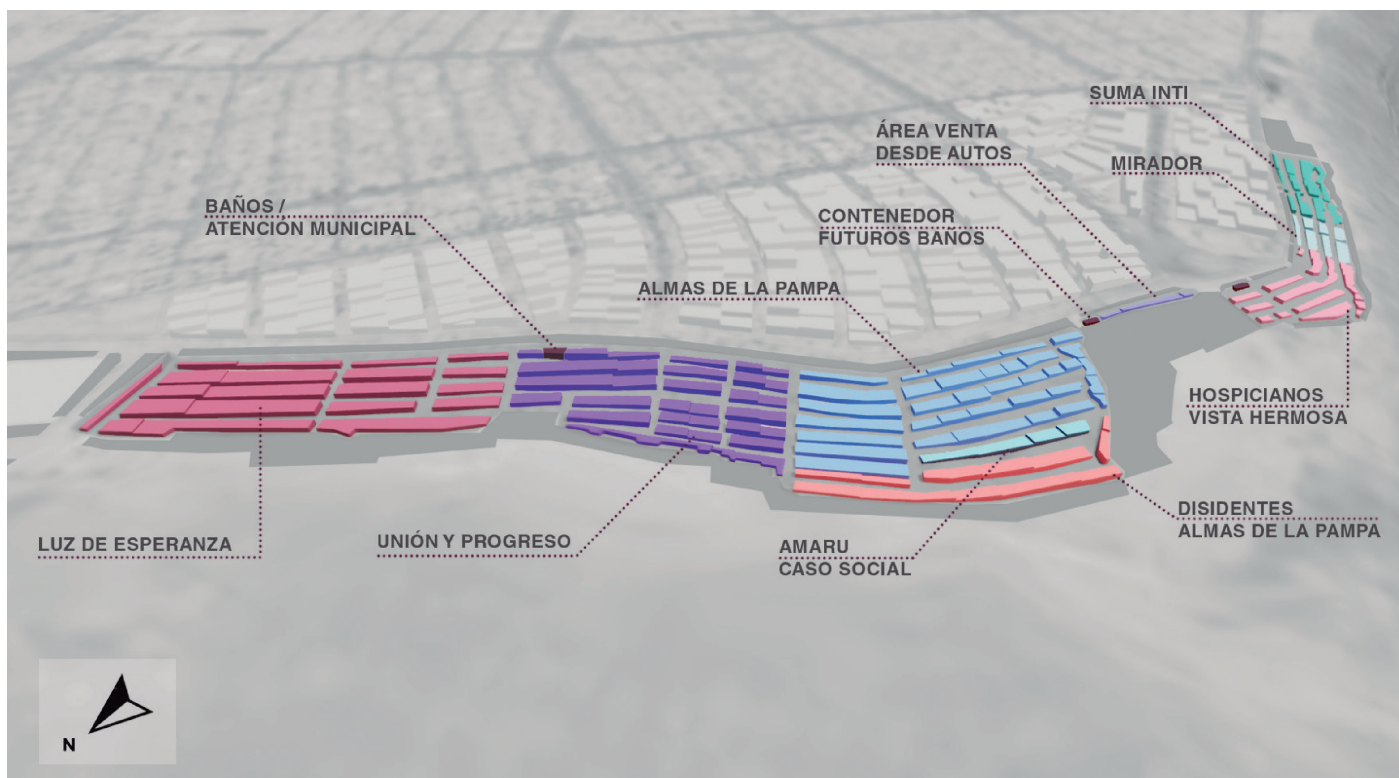


Image 5.33: Associations in *La Quebradilla*
Source: Osterling Dankers & González-Pavich, 2019

Official landfills

First there was the municipal landfill, Vertedero El Boro, situated in the north of Alto Hospicio. Due to urban expansion the distance between this dumpsite and the residential area decreased. The road leading up to the entrance of this facility has been heavily polluted with all sorts of solid waste materials. Moreover, this facility is not equipped with any environmental mitigation measures other than a wall delineating the perimeter restricting access to the site, except through the main entrance which is guarded and has a gate. For these reasons the Vertedero El boro was closed at the end of 2021. Both municipalities have since diverted to a newly constructed sanitary landfill.

Sanitary landfill Santa Ines, administered by private the company named Cosemar, is situated northeast of the urban area of Alto Hospicio near sector Las Quemadas and can be accessed by the road towards Caleta Buena.

Thirdly, there the Vertedero de Escombros, or debris landfill. The Vertedero de Escombros is located to the north of El Boro next to the Vertedero El Boro, but is accessed from the west. Upon approval in 2016 it was stated that this site will be used only for the disposal of debris resulting from demolition work and the reconstruction process, generated by the earthquakes of April 2014. In 2019 the sites lifespan was extended until 2023.



Image 5.34: Vertedero de Escombros to the left, vertedero El Boro to the right
Source: by author

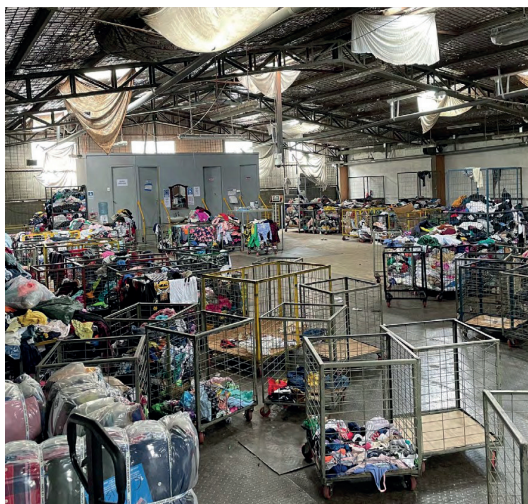


Figure 5.34: Larger sorting facility in Alto Hospicio.
Source: Muñoz et al., 2022, p. 105



Image 5.35: Small scale sorting business in Alto Hospicio.
Source: Google Streetview, 2014.

Stakeholder analysis

Stakeholder identification & profiling

In order to analyze stakeholder configurations it is necessary to first identify relevant stakeholders to the problem field and build their profile. In the table on the next page a set of stakeholders is listed, some of which represent a category of a plural and diverse group of stakeholders fulfilling a similar role. For example 'importers' include anyone receiving imported bales of clothing and in charge of sorting its contents. To illustrate the diversity among actors fulfilling this same stakeholder role, figures 5.17 and 5.18 depict two sorting facilities that are very different in their level of formal organization and scale of operation. Also 'vendors' range from local merchants selling their offer the feria in Alto Hospicio to franchises operating in several cities throughout Chile.

Furthermore, a special stakeholder I chose to bring forward is the main victim of the status quo: nature. More specifically by nature in this case I am referring to the delicate ecosystem of the Atacama desert and the sublime character of the natural desert landscape. As this is however a voiceless stakeholder, in the literal sense that nature cannot speak, activists are included into this stakeholder analysis as they strive to give a voice to the interests of nature.

Stakeholder configurations

To better understand the potential role of each stakeholder with regard to the generation of an alternative future for Iquique, I have placed the stakeholders on an onion diagram. The diagram is divided into three sectors: public, civic and private. The inner circle of the onion represents the highest level of interest, defined as the highest impact of a systemic change on their interests. Furthermore, the degree of power – referring to their ability to influence a systemic change – possessed by each stakeholder is visualized by font stress and their attitude towards the change is represented by color.

Special attention needs to be paid the fence-sitters. This group incorporates stakeholders that in the current situation make their living from used clothing. These stakeholders will likely tend to not be in favor of a systemic change abolishing this business, as that puts them at risk of losing their livelihood. However, considering the precarity of their situation, arguably, these stakeholders are among the ones most in need of a systemic change.

Engagement strategies

A powerful engagement strategy to be applied in the transition of the status quo to an alternative future in this case study can be the co-creation of a vision for Iquique and Alto Hospicio. Both municipalities could organize workshops or forums gather diverse perspectives and co-design a strategic vision that reflects the collective aspirations of residents. In this strategic vision a framework can be developed to facilitate the implementation of engagement strategies targeted at education programs for adaptation of the workforce, landscape regeneration and support for bottom-up initiatives providing funding and resources for grassroots projects.

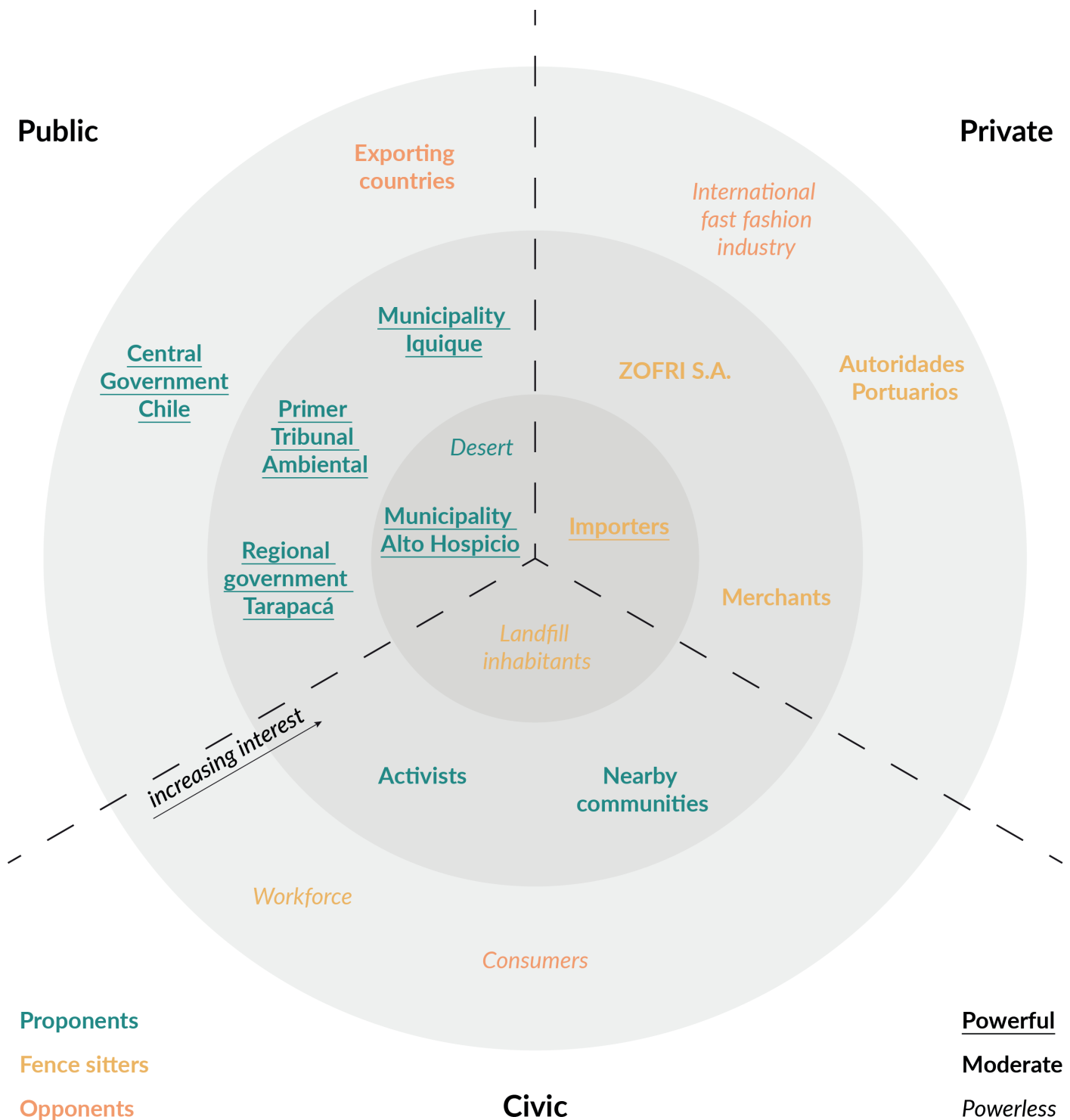


Image 5.36: Analyzing stakeholder configurations to define critical actors.
Source: by author.

Stakeholder	Domain	Interests
The Atacama Desert	Public	Sublimity, intrinsic value, ecology
Activists (i.e. desierto vestido)	Civic	Environmental justice, awareness
Individuals inhabiting landfills (including migrants)	Civic	Livelihood
Nearby communities (i.e. Toma Paso de la Mula)	Civic	Housing (healthy, safe, etc.)
Municipality Alto Hospicio	Public	Civic wellbeing
Municipality Iquique	Public	Civic wellbeing
Central government Chile	Public	Regional economic viability, Environmental preservation
Regional government Tarapacá	Public	Regional economic viability, Environmental preservation
Primer Tribunal Ambiental	Public	Adherence to legal environmental protection
ZOFRI S.A.	Private	Profit
Autoridades Portuarios	Private	Adherence to import regulations, profit
Importers	Private	Livelihood, profit
Merchants	Private	Livelihood, profit
Workforce (for example sorting and logistics)	Civic	Livelihood
Consumers	Civic	Purchasing power
Exporting countries	Public	Cheap waste disposal
International fast fashion industry	Private	Profit

	Problem perception	Resources / powers
	Environmental degradation	None
	Institutional inaction against (unauthorized) landfills and environmental contamination	Protest, campaigns, publicity
	Health threats	None (too marginalized)
	Health threats	Protest, vote, sue
	Pollution affecting public health, Environmental degradation	Policy, enforcement, funding
	Too much waste, Unauthorized landfills, Pollution affecting public health	Policy, enforcement, funding
al	Pollution affecting public health, Environmental degradation	National policy
al	Pollution affecting public health, Environmental degradation	Enforcement
ion	Unclear who is to blame	Legal verdicts
	None	Contracts
	None	Controls
	Decreasing quality of imported packs, due to increasing quantity of poor quality items	Dispose of leftovers responsibly
	Increasing competition fast fashion (cheap, online), saturated market	Dispose of leftovers responsibly
	Healthy working conditions, respectable salary	Trade union
	None	Buying consciously
	First world guilt	International regulation and agreements
	Brand image damage	Business model (fast vs. Slow fashion) Quality and quantity of production

Cataloging efforts against landfills

Exposing

Several actors are generating attention for the issue through the exposure of the clandestine landfills. These efforts include a foto series by Martin Bernetti (AFP), posts on Instagram by NGO Desierto Vestido, a detailed satellite image of one of the locations by SkyFi, a documentary by Italian television RaiPlay and new articles by international media.



Image 5.37: Desierto Vestido exposing brandnames of clothing on the landfills
Source: País Circular, 2023



Image 5.38: Social media post exposing a giant smoke cloud from a clandestine landfill
Source: gallinero.iquique on Instagram

Reshaping perception

In addition to efforts to expose the existence of the clandestine landfills, there are a number of creative initiatives that aim to change the perception of this issue. Examples of this type of effort against clandestine landfills include the artwork titled *El Gigante Vestido*, the Atacama Fashion week and a statement - NO MORE FAST FASHION - written in clothes on the site of landfill Mollecita by NGO Desierto Vestido.

The artwork *El Gigante Vestido*, interestingly, references the geoglyph *El Gigante de Tarapacá*, which the largest humanoid geoglyph on earth and situated not far from Iquique-Alto Hospicio. By referencing this ancient artwork carved into the surface of the desert landscape, it appears the makers want the spectators to think about the marks our consumerist behaviour is leaving on the planet.

The Atacama Fashion Week is a project of NGO *Desierto Vestido* in collaboration with Fashion Revolution. Organizing a fashion show amidst the landfills in the desert, they invite the spectator to “look at what the fashion industry refuses to see” (*Desierto Vestido & Fashion Revolution*, n.d.).

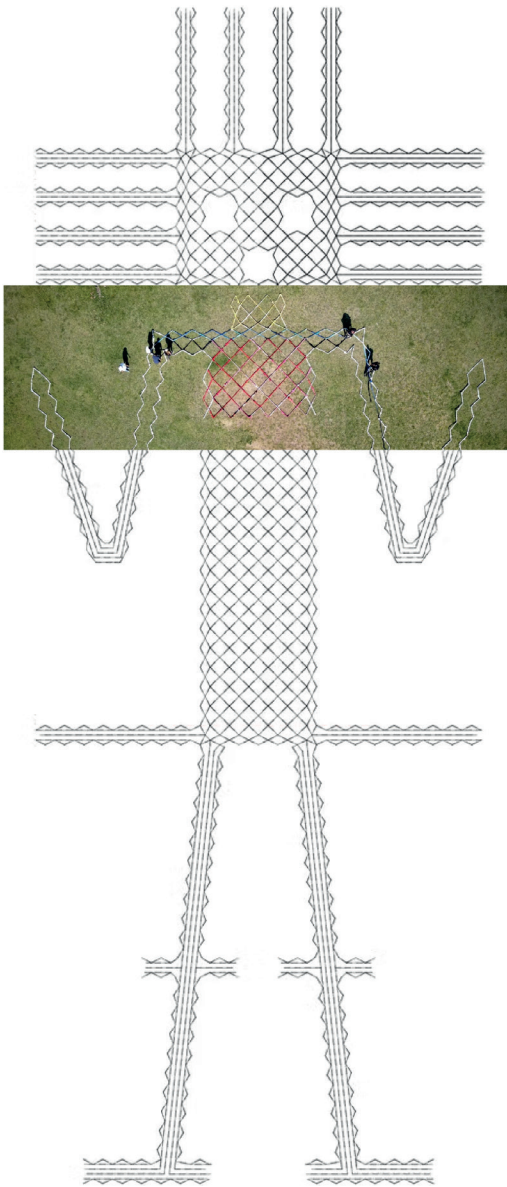


Image 5.39: Gigante Vestido Artwork
Source: El Gigante Vestido, edited by author



Image 5.40: Atacama Fashion Week
Source: trashimag.com 2024



Image 5.41a &b: Desierto Vestido demonstrating at clandestine landfill Mollecita
Source: Desierto Vestido on Instagram

Entrepreneurship

Furthermore, some local residents even have undertaken initiatives to construct a business reusing the material of superfluously imported used clothing.

EcoFibra was founded by Franklin Zepeda in 2018. At its factory in Alto Hospicio thermal insulation panels are produced from used clothing, processing up to 40 tons of used clothing per month in collaboration with Zofri, the free trade zone in Iquique, and with the support of the environmental authorities of the Tarapacá region (SwissInfo, 2021).

Ecocitex was founded by Rosario Hevia from Santiago, to recycle old clothes into high-quality eco-yarn (Miliani & Olivares-Droguett, 2022).

At Sembra, an eco-technology research centre in Nogales, central Chile, Mónica Zarini has been promoting entrepreneurship with social impact for more than 20 years and has studied the route of used clothing to find recycling solutions. Used clothes are used to make lamps, containers, notebooks, bags, boxes and even corporate gift collections (SwissInfo, 2021).

Angela Astudillo, co-founder of Desierto Vestido, reuses pieces of clothing she recovers from the landfills to produce new, unique items (Calderón, 2024).



Image 5.42: Angela Astudillo and partner at sewing workshop reworking clothes from the landfills
Source: Calderón, 2024



Image 5.43: Production of eco-yarn at Ecocitex
Source: Martin Bernetti



Image 5.44: Production of EcoFibra insulation panels
Source: Martin Bernetti



Image 5.45: Logo Ley Rep
Source: leyrep.cl

Ley REP:

In Chile a law exists that operates as a mechanism whereby producers of priority products are responsible for the organization and financing of the management of waste derived from the commercialization of their products in the country. The priority products established to date are tires, containers and packaging, lubricating oils, electrical and electronic equipment, batteries and accumulators, whose producers or importers must meet waste collection and recovery goals through the creation of management systems, among other obligations (Economía Circular, 2025). The Chilean ministry of the environment (MMA - Ministerio del Medio Ambiente) is working to incorporate textiles as a priority product in the Ley REP and thus promote the recovery of the waste they generate (Economía Circular, 2025b).

Lawsuit:

In March 2022, attorney Paulin Silva filed a lawsuit before the First Environmental Court to determine the responsibilities of the Municipality of Alto Hospicio and the Chilean government. Silva accused them of negligence for failing to oversee illegal dumpsites on the municipality's outskirts. The municipality claims to have increased inspectors and implemented surveillance systems, but limited resources and minimal state assistance have hampered their efforts. Meanwhile, the government asserts that waste management is a municipal responsibility, while others point out insufficient regulation of imported second-hand clothing and its disposal. The court has conducted site visits to assess the scale of the damage firsthand. The case remains under investigation (Órdenez, 2024).



Image 5.46: Primer Tribunal Ambiental on site visit
Source: Primer Tribunal Ambiental



Image 5.47: Primer Tribunal Ambiental on site visit
Source: Primer Tribunal Ambiental, 2022

MOVILIDAD

"Ciudad bien conectada, integrada y segura para desplazarse"



Diagnóstico:

Falta de transporte público y preponderancia en el uso del auto. Alto nivel de deterioro y discontinuidad de calles, veredas y ciclovía a nivel intercomunal.



Desafío

Impulsar formas sustentables de transportarse (bicicletas, scooters, transporte público), generando una red continua y segura para moverse a nivel de barrio y entre comunas.

Image #.: Mobility - "Well-connected, integrated and safe city to get around."

Diagnose: Lack of public transportation and predominance of car use. High level of deterioration and discontinuity of streets, sidewalks and bicycle lanes at the intercommunal level.

Challenge: Promote sustainable forms of transportation (bicycles, scooters, public transportation), generating a continuous and safe network to move around the neighborhood and between communes.

Source: Corporación Ciudades

MEDIOAMBIENTE

"Ciudad limpia, libre de basura y que pone en valor su paisaje desértico"



Diagnóstico

Graves problemas en el manejo de residuos, escasez hídrica, alto riesgo de desastres y poco aprovechamiento de energías limpias.



Desafío

Reconocer la identidad geográfica, climática y las características del territorio para fomentar la puesta en valor y cuidado del entorno a partir de proyectos responsables con el medio ambiente.

Image #.: Environment - "Clean city, free of garbage and that values its desert landscape."

Diagnose: Severe problems in waste management, water scarcity, high risk of disasters and low use of clean energy.

Challenge: To recognize the geographic and climatic identity and the characteristics of the territory in order to promote the value and care of the environment through environmentally responsible projects.

Source: Corporación Ciudades

EQUIPAMIENTOS

"Ciudad cercana, inclusiva y segura"



Diagnóstico

Concentración y poca diversidad de equipamientos, provocando desplazamientos innecesarios y zonas desprovistas de servicios en distintos puntos de la ciudad.



Desafío

Promover el desarrollo de equipamientos multipropósitos distribuidos equitativamente en el territorio, enfocados en ser puntos revitalizadores para los barrios y seguros para el encuentro de los vecinos.

Image #.: Facilities - "Nearby, inclusive and safe city."

Diagnose: Concentration and lack of diversity of facilities, causing unnecessary displacements and areas lacking services in different parts of the city.

Challenge: Promote the development of multipurpose facilities distributed equitably throughout the territory, focused on being revitalizing points for the neighborhoods and safe for neighbors to meet.

Source: Corporación Ciudades

Urban livability improvement plan

In 2022 a project led by Corporación Ciudades was launched for Alto Hospicio-Iquique under the name La Ciudad que Queremos, which means 'The City that we Want/Love'. The main goal of the project is to develop an integrated view of the territory to improve the quality of urban life in the medium and long term. The project consists of three main elements.

The first is the development of an Integrated Urban Diagnostic which entails a online available database of maps of geospatialized data regarding available urban indicators, analysis of plans, programs and projects under development, as well as information obtained through workshops, surveys and social network consultations.

The second part regards a participative project called Mesa de Ciudad, which means 'Table of the City', to promote process of dialogue between actors representing different sectors of society; civil, academic, public and private. Representatives of these sectors met monthly for a year to analyze the context, problems and possible urban solutions for the territory. Previous to which a survey titled Consulta Ciudad y Calidad de Vida was held. The survey conducted through social media received over seven hundred responses. Its aim was to discover the perception and preferences of the inhabitants of Iquique - Alto Hospicio in relation to the context of the city, its characteristics and desires for a future vision.

The third part is called Imagen Objetivo, which means 'Target Image', and concerns a vision for the future of the city. This vision is consolidated in a city agreement, which promotes a healthy, sustainable and integrated city through a collection of projects. Some of these projects are already being executed, while others still remain a (pre-)design stage. The projects are categorized into four main topics: Mobility, Environment, Facilities and Housing. For each of these categories an overall motto, diagnose and challenge has been formulated.

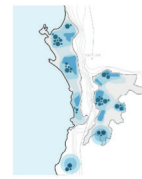
VIVIENDA

"Ciudad con viviendas que incorporen las cualidades del territorio y reconozcan la identidad local"



Diagnóstico

Barrios habitacionales céntricos deteriorados y zonas de mayor concentración de población, viviendas alejadas de servicios y equipamientos.



Desafío

Construir ciudad, reactivando el sector céntrico y sur de Iquique, y potenciando el área de Alto Molle y La Mula en Alto Hospicio, con objeto de localizar viviendas en entornos conectados, seguros y provistos de equipamientos y servicios.

Image #.: Housing - "City with housing that incorporates the qualities of the territory and recognizes local identity."

Diagnose: Deteriorated downtown neighborhoods and areas of high population concentration, housing far from services and facilities.

Challenge: To build a city, reactivating the downtown and southern sector of Iquique, and enhancing the Alto Molle and La Mula area in Alto Hospicio, with the aim of locating housing in connected, safe environments with facilities and services.

Source: Corporación Ciudades



Image 5.48: Map of all proposed projects in the city agreement
Source: Corporación Ciudades

Overview status quo

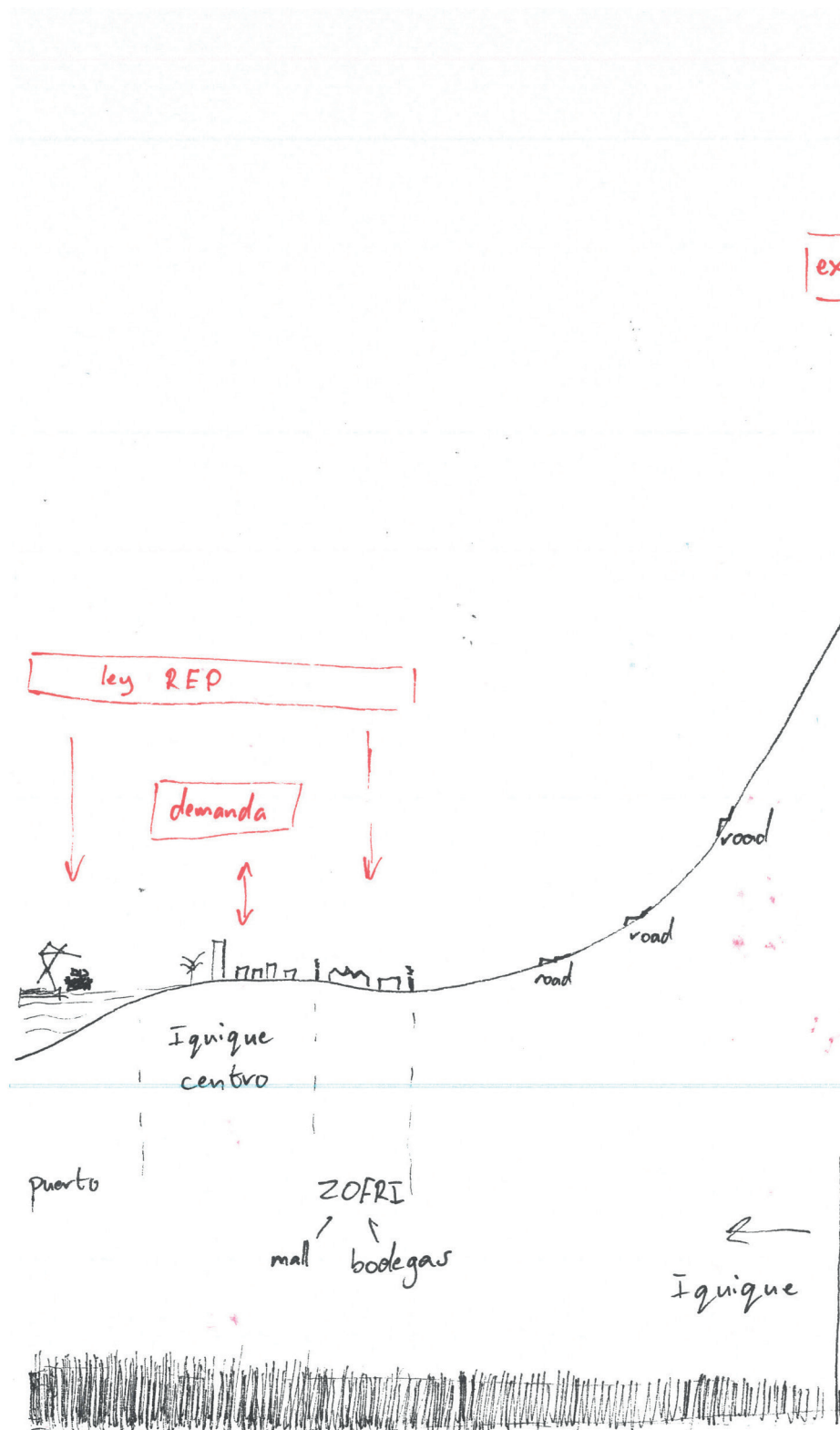
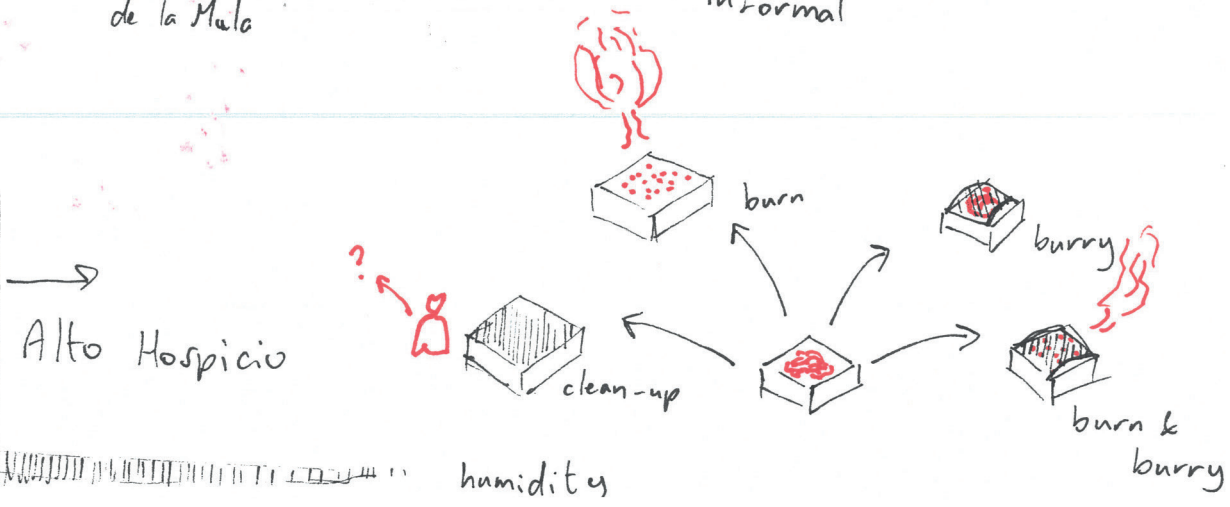
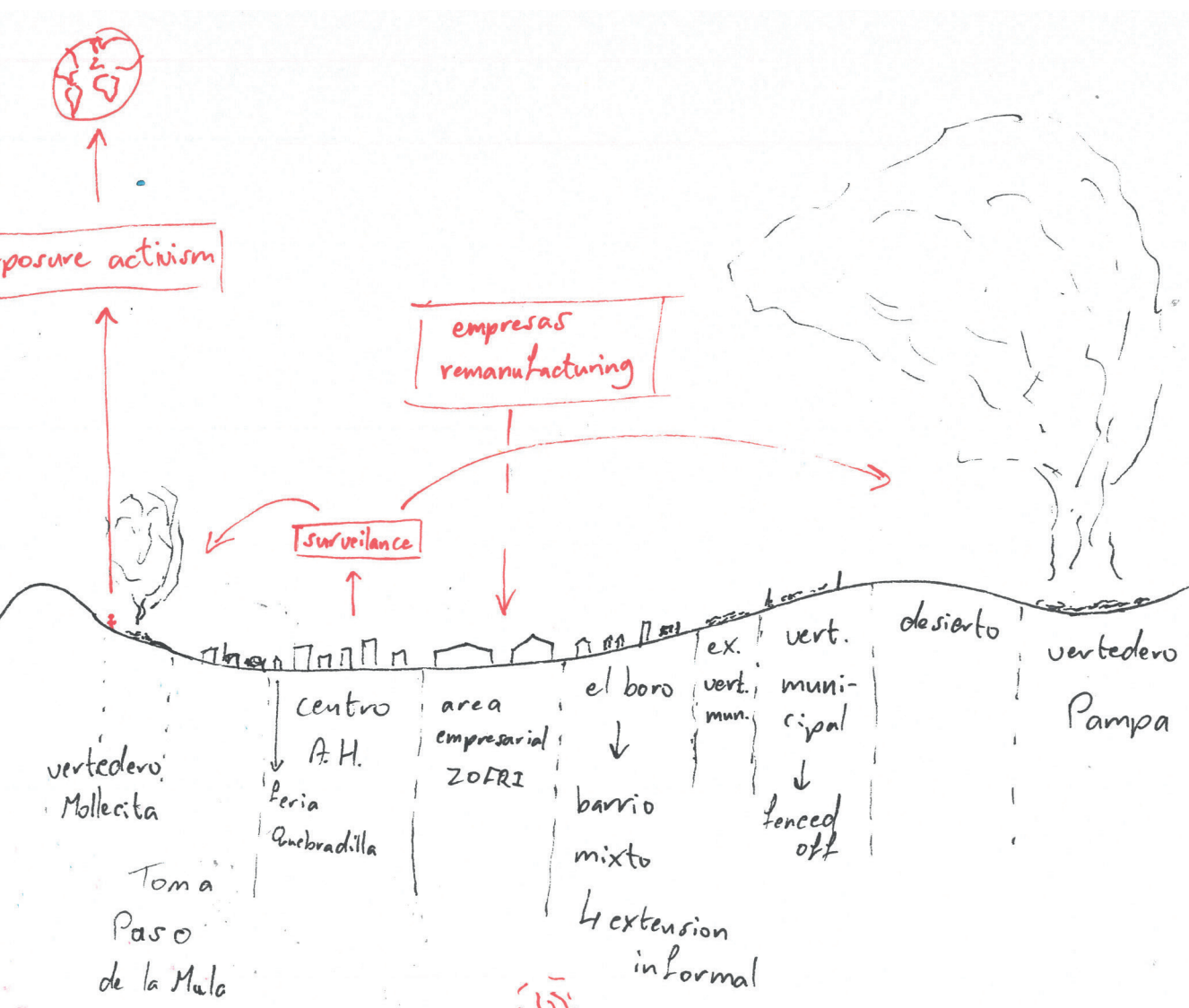


Image 5.49: Schematic section of status quo
Source: by author



6. FIELDWORK

Trip overview / El Boro / Photo report / Summary of interviews and conversations

Trip overview

During three weeks of fieldwork, I stayed in Alto Hospicio for a week and a half and in Iquique the other week and a half. I purposely planned this division as such to get an impression from the perspective of both sides of the cliff. For my accommodation in Alto Hospicio I intently chose a location in a neighborhood very close by one of the areas severely affected by the issue of micro dumps and clandestine landfills. I will elaborate on the experiences related to this in the next section.

The two main focusses of my fieldwork were 1) to experience and capture the local reality and 2) to gather views, opinions, and experiences related to the pending textile waste management crisis and to the problem of micro dumps and clandestine landfills through semi-structured interviews and other conversations with local experts and regular local people. The result regarding the first objective is represented in the photo report and the result of the second objective are presented in the daaropvolgende section.

In summary, I have interviewed three people: 1) official responsible for environmental management in the Department of Environmental Affairs, Sanitation, and Ornamental Services of the Municipality of Alto Hospicio, 2) a representative from the Tarapacá regional department of CORFO, and 3) a recycling professional from the ZOFRI Punto Limpio. Additionally, I spoke to other people, notably a sustainability director from ZOFRI S.A. and a local fashion designer.

Places I intently visited in relation to the topic of the research include La Quebradilla, El AGRO, ZOFRI and ZOFRI-Mall, the port area – although access to the actual port was restricted –, sector vertedero El Boro, sector Las Quemadas and Mirador Paso de la Mula. Furthermore, I went to visit the Gigante de Tarapacá geoglyph accompanied by my host and her daughter. The visit was less enervated and informative than I had expected. However, what was lacking in information regarding the history, meaning and preservation of the geoglyphs was compensated by the information available in the regional museum, located on Baquedano street, the main pedestrian street in the city center of Iquique.

In addition, to immerse myself in the local reality and thereby create a clearer understanding of the respective urban imaginaries of Alto Hospicio and Iquique, I also undertook other activities besides visiting locations with a clear and direct link to the subject at hand. These activities included, among other things, a picnic on the beach at the invitation of a friendly contact, exploring the city centers of both urban entities, accompanying my host and her daughter on daily outings to La Quebradilla or the supermarket, surfing on several

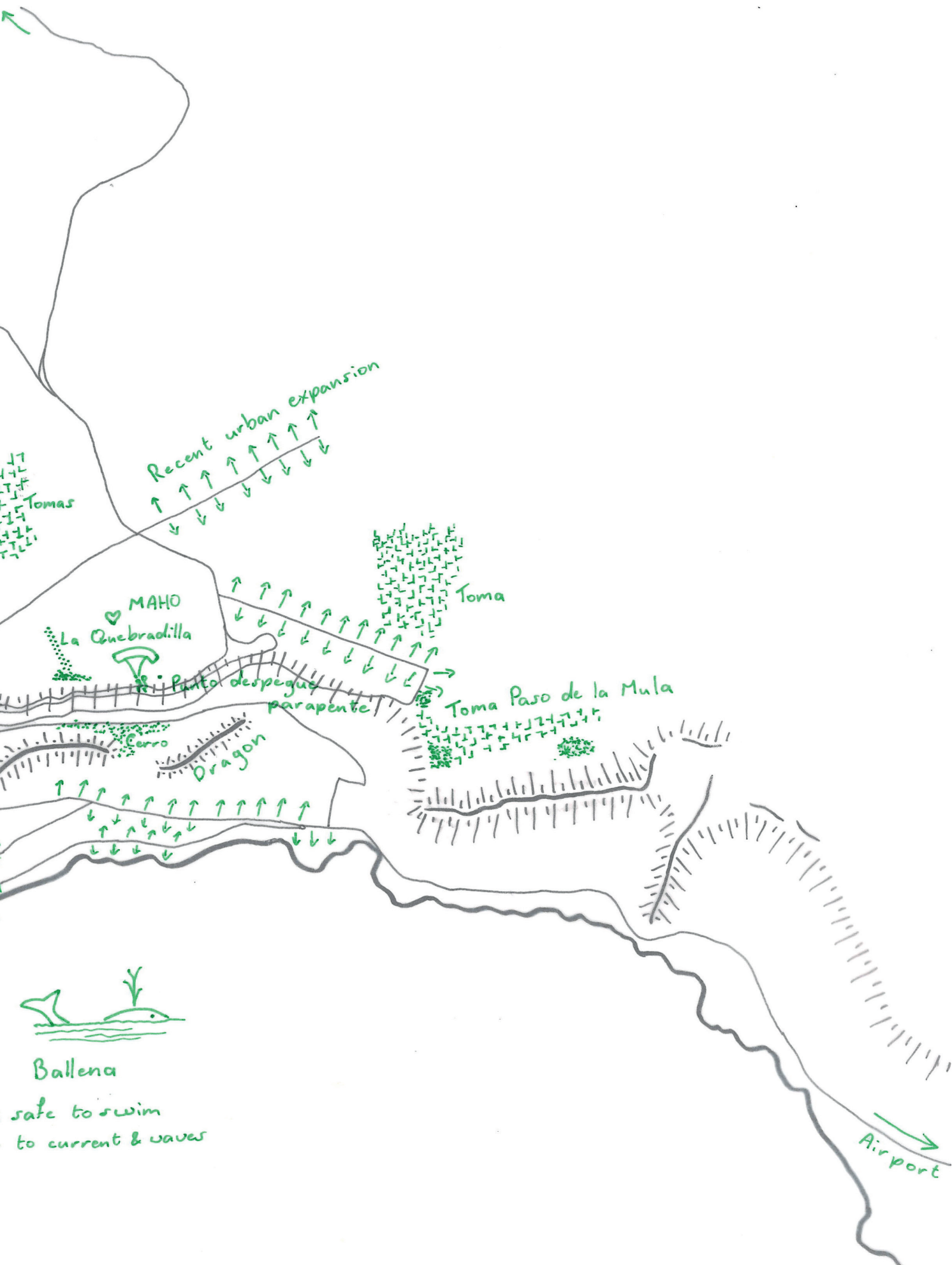
occasions, a paragliding flight, and yoga and zumba sessions on the beach in the early morning or early evening. For the latter, the timing was crucial, as the sun is too intense during the day to undertake or responsibly organize such activities. Furthermore, based on my experience and the views of locals, I can conclude that there is more to experience in Iquique than in Alto Hospicio, which is closely related to the residential character of Alto Hospicio.

Moreover, I traveled back and forth between Iquique and Alto Hospicio by bus several times, which gave me a clear idea of the impact of the cliff that separates them on their mutual accessibility. In this regard, I was positively impressed by the extensive bus schedule. I would only like to make two specific side notes. First, bus stops are missing in many places. Fortunately, it rarely rains in the desert. After asking in a small grocery store, it turned out that the custom is simply to stand somewhere along the route on the sidewalk and wait until a bus comes along and then signal it to stop. The advantage of this is that bus drivers are in the habit of stopping for passengers who signal that they want to get on, even if they are not at an official stop, and conversely are often also willing to stop at the corner of any random street if you ask nicely. Second, most bus routes are quite extensive zigzagging through neighborhoods both in Iquique and Alto Hospicio, which means that travel time by car would be significantly shorter. Which reminds me to mention that there is a shared taxi service in Iquique and Alto Hospicio. They are called colectivos and cover more or less specific trajectories or areas. Unlike taxis they charge a fixed tariff of 1000 CLP independent of the length of your journey, and they stop along the way to pick up other passengers as long as there is space in the car.

A side note to my impression of the area is that I was there during the final weeks of the summer holidays. Due to this the atmosphere is the city is likely more relaxed, more lively in places of recreation and less crowded in traffic.

Image 6.1 Softmap of fieldwork findings
Source: by author





El Boro



Image 6.2: Border of El Boro and desert landscape
Source: by author



Image 6.3: Road leading up to closed Vertedero el Boro
Source: by author



Image 6.4: Road leading up to closed Vertedero El Boro
Source: by author



Image 6.5: View over entrance of Vertedero El Boro
Source: by author

During my stay in Condominio Samaria, which is located in El Boro in the north of Alto Hospicio, I had a brief personal experience of what is it like to live in an area heavily polluted by solid waste.

In the morning of the 15th of February, I took a long walk over the hills in the area just behind the residential block leading up to the location of the closed facility of the Vertedero El Boro. On this walk I covered in total 6,6km in distance with 278meters of height difference. It took me 2:35 hours to complete and I took over 300 photos of which I selected 50. Their locations are marked yellow on the map, to include in an appendix. The road leading up to the vertedero was overflowed with waste material. In combination with the desolate atmosphere it was truly horrifying. Moreover, I spotted several kuros, marked orange on the map. 'Kuro' is a local term referring to improvised precarious homes constructed outside of informal settlements.

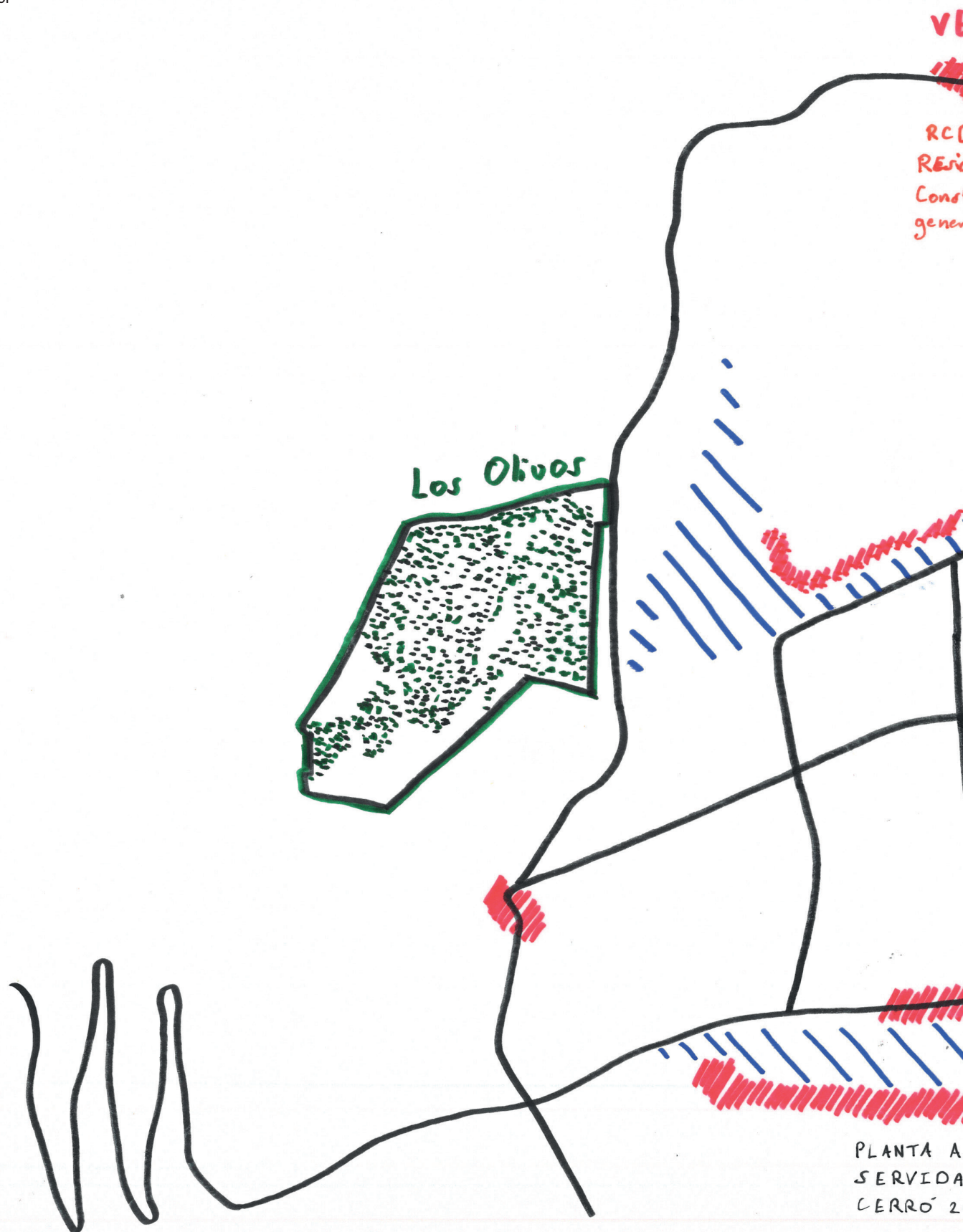
The most dangerous part of the walk was arriving back at the gate of the condominio where the dog from across the street decided to block the way guarding his territory by barking at me so very aggressively that I was truly frightened and I tried to calmly walk past and instead squeezed myself through a very narrow space between a parked car and temporary open pit for maintenance in the sidewalk, in order to safely reach the gate.



Image 6.6 Paseo por los cerros El Boro
Source: by author

* INTERCOMMUNAL

Image 6.7: Softmap of El Boro
Source: by author



VERTEDERO
ESCOMBROS

Residuos de
Construcción y Demolición
Cerrado por terremoto 2014

VERTEDERO
MUNICIPAL
CERRADO

RSD
Residuos Sólidos
Domesticiarios

AUTODROMO

GUAS
S
019

Photo Report

Alto Hospicio



Date and time: 24 February 2025, 10:22hrs.
Location: Parapente take off point, Alto Hospicio

Explanatory note: A view over the central city district of Alto Hospicio. The parque at the border of the cliff directly above the letters is Parque Los Cóndores, which is the southern limit of La Quebradilla.



Date and time: 24 February 2025, 10:24hrs.
Location: Parapente take off point, Alto Hospicio

Explanatory note: One of the most popular tourist activities in Iquique - Alto Hospicio is parapenting. There are many different agencies offering this experience. They all take off here and end at Playa Brava. A flight lasts a little over ten minutes and provides a spectacular view over the city of Iquique as well as a different view of the cliff side, revealing many 'kuros' situated on flatter parts of the mostly very steep slope.



Date and time: 18 February 2025, 13:46hrs.

Location: Avenida Ramón Pérez Opazo, Alto Hospicio

Explanatory note: Signs against the dumping of trash in public space are common in Alto Hospicio. Some are formal warnings pointing out the risk of getting a fine, like this one. But there are also many graffiti works saying 'no botar basura aquí' (= do not dump trash here).



Date and time: 27 February 2025, 13:05hrs.

Location: Avenida las Américas, Alto Hospicio

Explanatory note: Goods like (second hand) clothes are sold on markets, but also at 'coleros', which are unregulated stalls that appear in many parts of the city especially near commercial areas.

El Boro



Date and time: 20 February 2025, 08:17hrs.

Location: Skatepark El Boro, Alto Hospicio

Explanatory note: View over the city of Alto Hospicio from the busstop at the skatepark in El Boro.



Date and time: 13 February 2025, 20:37hrs.

Location: The cross on the hill behind Samaria street, Alto Hospicio

Explanatory note: View over the city of Alto Hospicio at dusk.



Date and time: 11 February 2025, 14:37hrs.

Location: Inside the cluster of informal settlements south of A-616, El Boro, Alto Hospicio

Explanatory note: Driving by the cluster of 'tomas', I asked my host about them and she decided to enter and drive around a bit to give me an impression. When I noted the tanks on the roofs, she explained that they are to store water supplied by the municipality. What I had not expected was to see so many cars inside of an informal settlement. My hosts then explained to me, however, that everyone in Alto Hospicio owns a car, even the poorest people, because cars are so cheap due to the Free Zone.



Date and time: 11 February 2025, 14:38hrs.

Location: Inside the cluster of informal settlements south of A-616, El Boro, Alto Hospicio

Explanatory note: Driving through the cluster, we passed through many gates, separating the different each of the 'tomas'. Noteworthy also, are the many Chilean flags, demonstrating a degree of chauvinism that to my understanding is commonly shared throughout all of Chile.



Date and time: 20 February 2025, 15:22hrs.

Location: Intersection Avenida la Pampa and Tiliviche street, la Tortuga, Alto Hospicio

Explanatory note: From the bus I could see a plume of smoke rising up from what I estimate is El Boro.



Date and time: 20 February 2025, 15:42hrs.

Location: Intersection Avenida Las Parcelas and A-616, El Boro, Alto Hospicio

Explanatory note: The Avenida Las Parcelas is a main road within the city of Alto Hospicio. Its clear layout and neat pavement contrast sharply with the layout of the A-616, which will be shown in the following photographs. The facility is one of two electricity stations in El Boro.



Date and time: 17 February 2025, 14:50hrs.
Location: Pet cemetery at A-616, El Boro, Alto Hospicio

Explanatory note: A bit outside of the urban area, there is an apparently clandestine pet cemetery located directly at the south side of the A-616 main road. The cemetery does not have any perimeter marking and it seems to be the source of a really bad smell that we noticed driving by with the car windows rolled down.



Date and time: 11 February 2025, 15:01hrs.
Location: Pet cemetery at A-616, El Boro, Alto Hospicio

Explanatory note: The pet cemetery is very poorly maintained. Many of the crosses are crooked and there is a lot of trash lying around on top of and between the graves. Note the contrast between the dirtiness of this sacrificial land plot and the beauty of the untouched desert landscape behind it. By the way, the blurry effect of the photo was caused by sun screen, which I needed to apply several times a day due to very high UV.



Date and time: 11 February 2025, 15:14hrs.

Location: A-616 near the Autodromo, El Boro, Alto Hospicio

Explanatory note: The roughly 130 meters between the A-616 and an informal settlement directly south of the Autodromo, a race circuit, are full of waste and ashes. This is also where the road to the former municipal landfill starts.



Date and time: 11 February 2025, 15:15hrs.

Location: A-616 near the Autodromo

Explanatory note: The 50 meters between the A-616 and industrial parcels on the North side of the road are scattered with waste, attracting pigeon and likely other pests.



Date and time: 17 February, 14:51hrs.
Location: A-616 near electricity station Los Cóndores, El Boro, Alto Hospicio

Explanatory note: Busstops are often not marked in Alto Hospicio as well as in Iquique. Therefore, busses generally just stop on the side of the road if someone is waiting or wants to get off. As the roadside along the A-616 is full of micro dumps, this means busses here stop right next to piles of waste.



Date and time: 18 February 2025, 16:58hrs.
Location: Bus stop A-616 / Pasaje Ocho

Explanatory note: This is what getting off the bus at the A-616 looks like: a pile of waste being visited by stray dogs and a small open fire of burning waste.



Date and time: 11 February 2025, 15:00hrs.

Location: A-616 across the street from electricity station Los Cóndores, El Boro, Alto Hospicio

Explanatory note: Micro dump on the spot marked as a bus stop on Google Maps.



Date and time: 17 February 2025, 14:53hrs.

Location: Avenida El Boro at intersection with A-616, Alto Hospicio

Explanatory note: A few days before I witnessed two men starting this micro dump in the middle verge. I did not manage to take a picture of the act, as were driving by quickly.



Date and time: 15 February 2025, 19:48hrs.

Location: Road connecting Avenida El Boro and Salitrera Domeyko at the level of Pasaje Prosperidad, El Boro, Alto Hospicio

Explanatory note: Driving through the industrial quarter north of the A-616, my host and I stumbled upon two small open fires. Circling back, we drove by again just when a heavily pregnant woman walked out and a fed a suitcase to the fire, apparently undisturbed by the health risks of smoke from burning materials like plastics and polyester. I was too shocked to take a photo of her. Note also, how this road does not have a clear lay out, or even does not have one at all. I do not recall clearly whether it is a dirt road, or a poorly maintained paved road covered by a layer of dust and sand.



Date and time: 20 February 2025, 15:38hrs.

Location: Intersection Avenida Monte los Olivos and A-616, El Boro, Alto Hospicio

Explanatory note: On a vacant plot of land between the electricity station and the cluster of informal settlements south of the A-616 some people have established a campment of tents. From my host I understood that they are gypsies and they are frowned upon, although they are harmless. The plot of land they occupy with only seven tents (and at least the same number of vehicles) is quite large in comparison with density of the adjacent informal settlements.

La Quebradilla



Date and time: 11 February 2025, 13:39hrs.

Location: La Quebradilla at the level of Avenida Esmeralda, Alto Hospicio

Explanatory note: View over La Quebradilla market. Stands are organized into long rows with wide paths between them. Some stallholders put an extra 'toldo' or canopy on the path in front of their stand to either of shade to their customers or extend their exhibition space a bit. There is a lot of space for parking behind (to the left in this picture) the market. The vacant plot in the back on the left side is the military precinct.



Date and time: 11 February 2025, 12:18hrs.

Location: La Quebradilla parking strip northwest, Alto Hospicio

Explanatory note: The parking strip on the northwest edge of the market is situated on an elevated plateau compared to the market itself, marking clearly the border between parking space and market space. The trucks in this picture are very common among stallholders.



Date and time: 11 February 2025, 12:21 hrs.
Location: La Quebradilla, Alto Hospicio

Explanatory note: The offer at La Quebradilla varies from fruits and vegetables (stall on the right in the photo) to dried fruits and seeds (stall on the left in the photo) and from clothes and shoes to toys, storage boxes and tableware. The ground is rock hard so parasols are weighed down to prevent them from being blown away by the wind.



Date and time: 11 February 2025, 13:18hrs.
Location: La Quebradilla near Parque Los Condores, Alto Hospicio

Explanatory note: Apart from fixed stalls, there are many ambulant vendors with wheeled carts selling natural juices in a wide variety of flavors, including black corn. Prepared food, such as empanadas, sopaipillas (fried dough planes) and barbequed meat, is also sold on the market at fixed stands.



Date and time: 18 February 2025, 12:46hrs.

Location: La Quebradilla, Alto Hospicio

Explanatory note: SStall specialized in underwear. Prices are as low as 300 CLP (approximately €0,30).



Date and time: 18 February 2025, 12:17hrs.

Location: La Quebradilla, Alto Hospicio

Explanatory note: Clothing offered on La Quebradilla is presented either in piles for costumers to dig through or neatly put on hangers in racks. Nicely, presented clothes typically have a higher price and are supposedly of better quality.



Date and time: 11 February 2025, 13:09 hrs.

Location: Edge of the cliff at the margin of La Quebradilla, Alto Hospicio

Explanatory note: The sloping edge of the cliff appears an unregulated no-mans land. I noticed there are even a few 'kuros', precarious improvised homes outside of informal settlements, situated here.



Date and time: 11 February 2025, 13:07hrs.

Location: Edge of the cliff at the margin of La Quebradilla, Alto Hospicio

Explanatory note: One of the inhabitants of this particular 'kuro' is apparently a child.



Date and time: 11 February 2025, 12:46hrs.

Location: Edge of the cliff at the margin of La Quebradilla, Alto Hospicio

Explanatory note: The location of La Quebradilla offers a beautiful view over Iquique, however the edge of the cliff has been transformed into a micro dump.



Date and time: 11 February 2025, 12:45hrs.

Location: Edge of the cliff at the margin of La Quebradilla, Alto Hospicio

Explanatory note: View to the south at the edge of the cliff at the margin of La Quebradilla. The slope of the cliff is used as a micro dump.



Date and time: 13 February 2025, 19:50hrs.
Location: La Quebradilla, Alto Hospicio

Explanatory note: The edges of the market space present an accumulation of waste, especially notable after market hours.



Date and time: 15 February 2025, 18:10hrs.
Location: La Quebradilla, Alto Hospicio

Explanatory note: After the daily dismantling of the market, heavy machinery appears to clean-up left behind waste.



Date and time: 15 February 2025, 18:12hrs.
Location: La Quebradilla, Alto Hospicio

Explanatory note: Every day a clean up team, send by the municipality, arrives after market hours to clean-up left behind waste.



Date and time: 15 February 2025, 18:12hrs.
Location: La Quebradilla, Alto Hospicio

Explanatory note: Every day a clean up team, send by the municipality, arrives after market hours to clean-up left behind waste.



Date and time: 15 February 2025, 18:13hrs.

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Date and time: 15 February 2025, 18:13hrs.

Location: La Quebradilla, Alto Hospicio

Explanatory note: Every day a clean up team, send by the municipality, arrives after market hours to clean-up left behind waste.

The interior



Date and time: 17 February 2025, 09:47hrs.

Location: Route 15, Huara, Tarapacá

Explanatory note: Cerro Unita on which El Gigante de Tarapacá is located, appears like an island in sea of mist.



Date and time: 17 February 2025, 10:17hrs.

Location: Cerro Unita, Huara, Tarapacá

Explanatory note: El Gigante de Tarapacá on a cloudy day.



Date and time: 17 February 2025, 12:17hrs.

Location: A-565 leading from route 15 down into the Quebrada de Tarapacá

Explanatory note: After visiting the giant, we continued a bit further into the interior to see the small settlements along the Quebrada de Tarapacá, which is one of the few sources of water in this part of the desert. This means it is also relatively suitable for agriculture. These crop fields are an important source of food, which is also being sold at La Quebradilla and Agropecuarios in Alto Hospicio and Iquique.



Date and time: 17 February 2025, 12:36hrs.

Location: Town center of Tarapacá (the town)

Explanatory note: The church was renovated a few years ago after it burned down in a fire caused by unattended candles. Now it is closed to prevent people from entering and lighting candles. The white and green flags are left over from recent religious festivities.

Las Quemadas



Date and time: 17 February 2025, 08:41hrs.

Location: Ruta 16 near Parque Empresarial ZOFRI, Alto Hospicio

Explanatory note: Heading to the interior on our way to go visit El Gigante de Tarapacá, we saw a big smoke plume rising up from sector Las Quemadas.



Date and time: 17 February 2025, 08:52hrs.

Location: Junction A-616 and route 16

Explanatory note: A bit further down the road another smoke plume rose up from a site just north of the junction connecting the A-616 to route 16.



Date and time: 17 February 2025, 14:20hrs.
Location: Ruta A-616 near junction with ruta 16

Explanatory note: On our way back from the interior we drove over the A-616 and drove past the approximate point from where we saw the second smoke plume rising up this morning.



Date and time: 17 February 2025, 14:12hrs.
Location: Ruta A-616 near junction with ruta 16

Explanatory note: This part of the road curves down a quite steep landscape. The guardrail here is a safety measure to prevent traffic accidents. However, the relative cleanliness of the surface behind it indicates that it is also an effective measure to prevent vehicles from going off the road to dump waste.



Date and time: 17 February 2025, 14:22hrs.
Location: Ruta A-616 near junction with ruta 16

Explanatory note: Waste and ashes apparently washed out from a higher point in the landscape by (rain?) water.



Date and time: 17 February 2025, 14:26hrs.
Location: Camino Caleta Buena near intersection with A-610

Explanatory note: Just behind a fenced plot in the narrow angle of the intersection of Camino Caleta Buena and A-610 there is a vast clandestine landfill. For a length of approximately 500 meters the site is restricted with concrete barricades keeping out vehicles. However, the barricades end abruptly leave opportunity to access the site going around them.



Date and time: 17 February 2025, 14:28hrs.

Location: Camino Caleta Buena

Explanatory note: A bit further down the road the landscape encloses the road, resulting in an only narrow strip of micro dumps. Driving up the road we passed by a man walking up this road, which seemed strange. He was accompanied by a dog and dragging with him a container and a heap of unidentifiable stuff on top of it. Where he was going on foot is unclear as this road does not lead to many places other than a clandestine landfill (3km), a sanitary landfill (4km) and Caleta Buena (>40km).



Date and time: 17 February 2025, 14:31hrs.

Location: Sector Las Quemadas at intersection Camino Caleta Buena and A-510

Explanatory note: This is the site from where, presumably, we saw the first smoke plume rising up this morning. It is the largest clandestine landfill in Alto Hospicio and has a high prevalence rate of textile waste. The ground is covered in ashes.



Date and time: 17 February 2025, 14:33hrs.

Location: Sector Las Quemas

Explanatory note: The accumulation of waste traces the road.



Date and time: 17 February 2025, 14:34hrs.

Location: Sector Las Quemas

Explanatory note: A view over the vast contaminated area from higher up.



Date and time: 17 February 2025, 14:35hrs.

Location: Sanitary landfill Cosemar

Explanatory note: The entrance gate of the sanitary landfill run by the private enterprise named Cosemar.



Date and time: 17 February 2025, 14:34hrs.

Location: Sanitary Landfill Cosemar

Explanatory note: The sanitary landfill is equipped with environmental protection measures such as a cover sheet in the craters for waste disposal.



Date and time: 17 February 2025, 14:40hrs.
Location: Sector Las Quemas

Explanatory note: View of the contamination driving down from the Cerro Esmeralda. The road running through this sector is rather narrow and has many holes.



Date and time: 17 February 2025, 14:43hrs.
Location: Camino Caleta Buena

Explanatory note: On the way back we saw the man with the blue helmet, container and dog again, advancing slowly.



Date and time: 17 February 2025, 14:44hrs.

Location: Camino Caleta Buena aproxamitely 1,5km from intersection with A-610

Explanatory note: On a slope by the Camino Caleta Buena we saw a cluster of 'kuros', (precarious and improvised homes outside of informal settlements).



Date and time: 17 February 2025, 14:27hrs.

Location: Camino Caleta Buena approximately 1,5km from intersection with A-610

Explanatory note: A dog lying next to a smaller group of kuros from the cluster.

Paso de la Mula



Date and time: 27 February 2025, 13:15hrs.

Location: Main entrance road to Paso de la Mula

Explanatory note: One of the biggest textile dumps is located behind the vast informal settlement at Paso de la Mula. I decided to take the bus there and see how far I could approach, without feeling unsafe. My first impression was this stray dog walking past the welcome sign to Paso de la Mula.



Date and time: 27 February 2025, 13:16hrs.

Location: Across the road from the bus stop at Paso de la Mula

Explanatory note: After getting off the bus, I was not exactly sure how to approach, so I followed this pregnant woman, presuming she would know the way.



Date and time: 27 February 2025, 13:50hrs.

Location: Vacant plot between Paso de la Mula and Circunvalencia Sur

Explanatory note: Not far from the informal settlement Toma Paso de la Mula a multi storey housing project is in construction. The location of this site is disconnected from the built up area of Alto Hospicio further contributing to the discontinuity of urban development in Alto Hospicio. Note also the stark contrast between this project and Toma Paso de la Mula to the right.



Date and time: 27 February 2025, 13:20hrs.

Location: Vacant plot between Paso de la Mula and Circunvalencia Sur

Explanatory note: Micro dump including hundreds of shoes



Date and time: 27 February 2025, 13:21hrs.

Location: Vacant plot between Paso de la Mula and Circunvalencia Sur

Explanatory note: View over Toma Paso de la Mula. Approaching the informal settlement I felt a bit uneasy and decided not to enter much further. I did continue a little further walking around the first cluster of homes to get a closer look at the dumpsite I spotted from here.



Date and time: 27 February 2025, 13:37hrs.

Location: Micro dump at the margin of Toma Paso de la Mula

Explanatory note: I got a bit closer to the dumpsite I spotted from higher up, but did not get very close, because I saw people on the site. It looked like among them were a few children playing, chasing after each other.



Date and time: 27 February 2025, 13:40hrs.
Location: Mirador Paso de la Mula

Explanatory note: A train track in disuse runs along the side of the cliff separating Iquique and Alto Hospicio.



Date and time: 27 February 2025, 13:40hrs.
Location: Mirador Paso de la Mula

Explanatory note: The view of Iquique and Alto Hospicio from the Paso the la Mula

Between Iquique and Alto Hospicio



Date and time: 20 February 2025, 15:12hrs.
Location: Ruta 16 near roundabout El Pampino

Explanatory note: View of the side of the cliff separating Iquique and Alto Hospicio, the Segundo Acceso and the back side of Cerro Dragón.



Date and time: 20 February 2025, 15:11hrs.
Location: Ruta 16

Explanatory note: A view over Iquique from ruta 16.



Date and time: 27 February 2025, 12:49hrs.
Location: Ruta 16

Explanatory note: from the bus goin up to Alto Hospicio I spotted a micro dump on a plateau next to ruta 16.



Date and time: 27 February 2025, 14:05hrs.
Location: Avenida Tadeo Haenke near junction with the Segunda Acceso

Explanatory note: Coming down from Paso de la Mula over the second access I spotted several 'kuros' on the side of the cliff.

Iquique



Date and time: 26 February 2025, 11:47hrs.

Location: Plaza Arturo Prat, Iquique

Explanatory note: This is the central square of Iquique, with the Torre del Reloj, being its main landmark. Connected to it is Baquedano street, which is the main pedestrian area in the city center. On this street many restaurants and tourism agencies are located.



Date and time: 20 February 2025, 12:45hrs.

Location: Playa Cavancha, Iquique

Explanatory note: Iquique has two main beaches, both are very popular. This is the Playa Cavancha which is geographically protected from the roughness of the ocean by its inward curve and the peninsula, making the water suitable for swimming, surfing, paddle-boarding. The other beach, the Playa Brava is very long and swimming here would be dangerous. However, there are a lot of activities and sports facilities along this beach. Moreover, during my trip some whales appeared in front of this beach in the ocean very close to the shore.



Date and time: 23 February 2025, 12:53hrs.

Location: Plaza Arturo Prat, Iquique

Explanatory note: A local fashion designer who focusses on working with rescued material invite me to assist at a photoshoot of her work.



Date and time: 20 February 2025, 19:13hrs.

Location: Intersection Avenida Héroes de la Concepción and Las Rosas, Iquique

Explanatory note: The view from my appartement in Iquique, looking out over a densely urbanized part of Iquique, including the only informal settlements of Iquique in the back, and at the side the cliff wherein the zigzag road leading down from Alto Hospicio is marked.



Date and time: 26 February 2025, 10:46hrs.

Location: Edificio Finanzas at Simón Bolívar, Iquique

Explanatory note: A view of the port of Iquique from the office of CORFO.



Date and time: 16 February 2025, 15:41hrs.

Location: Muelle Prat, Iquique

Explanatory note: The port of Iquique is home to not only boats, big and small, but also sea lions. The smell around here was really bad.



Date and time: 26 February 2025, 11:54hrs.

Location: Tarapacá street, Iquique

Explanatory note: On this shopping streets, products are sold not only inside stores but also out on the streets.



Date and time: 26 February 2025, 11:52hrs.

Location: Intersection Tarapacá street and Obispo Labbé, Iquique

Explanatory note: These so called 'coleros' often occupy a large portion of the sidewalk.



Date and time: 27 February 2025, 16:41hrs.

Location: ZOFRI Mall

Explanatory note: Within the Free Zone, there is a Mall, where products are sold to the greater public free of taxes. This mall is a popular pass time for many people in Iquique. The mall was expanded over time. There is a very clear difference between the older and the newer part. The older part has a rather low ceiling and the shop spaces are very small and overly full with products, making the mall feel very dense and chaotic.



Date and time: 21 February 2025, 18:49hrs.

Location: ZOFRI

Explanatory note: One of many used textile importer warehouses in the ZOFRI.



Date and time: 21 February 2025, 18:48hrs.

Location: ZOFRI

Explanatory note: Inside one of many used textile importer warehouses in the ZOFRI.



Date and time: 27 February 2025, 11:26hrs.
Location: Punto Limpio ZOFRI

Explanatory note: Situated in a narrow space between two buildings there is a Punto Limpio in the ZOFRI.



Date and time: 27 February 2025, 11:25hrs.
Location: Punto Limpio ZOFRI

Explanatory note: Here waste materials are collected separately based on their material nature to be able to be recycled.



Date and time: 27 February 2025, 11:25hrs.
Location: Punto Limpio ZOFRI

Explanatory note: The collected materials are compacted into bales to be transported elsewhere for recycling.



El Agro



Date and time: 26 February 2025, 13:01hrs.
Location: El Agro, Iquique

Explanatory note: Terminal Agropecuario de Iquique, popularly known as El Agro, is originally a farmers market. It is a cluster of long, roofed passages that expands over several blocks covering an area nearly 40.000m².



Date and time: 26 February 2025, 13:00hrs.
Location: El Agro, Iquique

Explanatory note: The roofs are mostly semi translucent allowing daylight to enter.



Date and time: 26 February 2025, 13:13hrs.
Location: El Agro, Iquique

Explanatory note: In addition to farmers products, many other products are sold here.



Date and time: 26 February 2025, 13:12hrs.
Location: El Agro, Iquique

Explanatory note: This is a waste collection point at El Agro, however it only collects organic waste, which makes sense considering the origin of the site, although the market offer is nowadays way more diverse.



Date and time: 26 February 2025, 13:25hrs.
Location: El Agro, Iquique

Explanatory note: The western section of El Agro appears to be focused more particularly on clothes. Passages are narrow. Prices are low.



Date and time: 26 February 2025, 13:35hrs.
Location: El Agro, Iquique

Explanatory note: In the clothing focused section there is a small space of greenery with a bench, which was very pleasant to find between all the narrow passages overflowing with textile.

Summary of interviews and conversations

Interview with official from the Municipality of Alto Hospicio

The interview was conducted with the official responsible for environmental management in the Department of Environmental Affairs, Sanitation, and Ornamental Services of the Municipality of Alto Hospicio. The discussion focused on the issue of illegal dumping and burning of used clothing in the desert surrounding the city, the municipal efforts to control it and the legal and logistical difficulties involved.

According to the official, the municipality began to document the issue around 2012 with a particular focus on a hotspot for dumping and burning textile was a 12.5-hectare site in an area locally known as Cerro La Mula, located in the southern part of the commune. There, piles of discarded clothing up to six meters high were set on fire repeatedly to make space for more waste. These fires, fueled by synthetic materials like polyester, were hard to extinguish and produced toxic smoke. Due to the size and density of the piles, the fires were hard to extinguish, making the fires last anywhere between three days and a week. The municipality recorded at least twelve such fires.

In 2019, the municipality conducted a detailed environmental diagnosis in collaboration with a geographer and an environmental engineer. Through fieldwork they mapped illegal dump sites and estimated the volume of accumulated waste both within the urban area and the periphery where most dump sites are located. Based on this analysis, the municipality developed two main lines of action: waste management on the one hand and surveillance on the other.

In addition to these two main lines of action, waste management and surveillance, a third strategic development has been to establish a working group engaging in dialogue with the authorities responsible for the issue, as well as with users of the ZOFRI, in an effort to find a collaborative solution. At first, the private parties such as the organization of the ZOFRI were unwilling to cooperate, knowing they are by no means legally obliged to do so. However, due to increased media attention worldwide and social pressures over time, they came around and there is now a good relationship between the municipality and the organization of the ZOFRI and each of the used textile importers that operate there.

To deter illegal dumping, the city installed 220 surveillance cameras in urban and peripheral areas. Some cameras are equipped with automatic license plate recognition to help identify vehicles involved in violations. Since the cameras were installed, the number of reported dumping incidents has fallen by about 50%, according to the official.

The Environmental Department currently issues around 40 fines per month. Working together with the Public Security Department, approximately 300 fines had been issued at the time of the interview. However, enforcement remains a challenge. Many fines are dismissed by local judges who require very specific evidence—typically a photo of a person in the act of dumping waste. A vehicle parked next to a pile is not enough. In one month, 100 fines were canceled due to insufficient documentation. The official said that some vehicles have been caught multiple times without consequences due to the difficulty of satisfying legal requirements.

A major structural obstacle is that current regulations do not allow textile waste in sanitary landfills. The local landfill, operated by the

private company Cosemar, cannot accept used clothing because of how it affects landfill stability. Even if permitted, the fee—20,000 Chilean pesos per ton—is often unaffordable for small-scale vendors and others handling unsellable textiles. Additionally, there are no local companies dedicated to transporting or processing textile waste. The national recycling law (Ley REP) does not yet include textiles, which means there is no established system for managing this type of waste.

Another limitation is that many illegal dump sites are located on state-owned land managed by Bienes Nacionales. The municipality cannot clean these areas without permission. In the past, it did so without authorization and was later sanctioned by the national auditing body (Contraloría). To address this, the city is currently negotiating an agreement with the Ministry. Once signed, it will allow municipal crews to clean these sites legally, provided the Ministry is notified and the work is properly documented.

In recent years, the municipality has expanded its waste management capacity. Between 2023 and 2025, the fleet of garbage trucks increased from five to twelve. In Quebradilla, a major used clothing market, the city provides daily cleaning with a team of 20 workers and an excavator. According to the official, about 80% of the leftover clothing waste from Quebradilla is picked up by the municipality and mixed into general waste so it can be accepted by the landfill. The remaining 20% is still being dumped in the surrounding desert.

In informal settlements—or “tomas”—that are not part of the formal urban plan, municipal waste collection contracts do not apply. As a result, the city rents dump trucks and removes waste manually from these areas Monday through Friday. This additional service costs around USD 80,000 per month. Total municipal spending on garbage collection and landfill fees is approximately USD 270,000 per month.

The official estimated that about 300,000 cubic meters of accumulated waste remain in desert areas around the city. Cleaning this volume would require the use of heavy machinery and could cost around USD 12 million. If all this waste were sent to the landfill, it would reduce the facility’s lifespan from 20 years to just 3.

The city has also taken steps in environmental education. A professional educator was hired to give talks in schools and neighborhood councils. A private recycling company also helps by offering workshops. While these programs aim to change long-term behavior, the official noted that their impact will take time. Children learn quickly but do not yet make household decisions. Meanwhile, many adults ignore scheduled garbage collection times, and waste continues to appear even in areas where trucks pass up to three times a day.

Fines are issued for putting garbage out at the wrong times, and some surveillance cameras can zoom in and automatically read license plates. Still, many fines are reduced or annulled by judges, and enforcement remains inconsistent. The official observed that many residents do not take responsibility for their waste unless there are financial consequences.

A major development currently underway is the construction of a textile recycling plant by ZOFRI. The plant is located on a 25-hectare site near the road to Humberstone and is scheduled to begin operations in the coming year. It will process all the textile waste generated in the commune and convert it into thermal insulation fiber for export to countries such as Turkey and Brazil. ZOFRI expedited the project after its storage areas reached capacity and became a fire risk. The municipality helped by assisting with the necessary permits and paperwork.

There are 53 major importers operating in ZOFRI, each employing more than 100 people. These importers bring in containers of secondhand clothing, sort it by quality, and distribute it to markets across Alto Hospicio and other areas. According to the interviewee, waste is generated throughout the supply chain, particularly when clothing cannot be sold or reused. Once the clothing is sold and distributed, responsibility for its disposal generally lies with the buyer.

The percentage of clothing that ends up as waste is debated. Some reports have claimed the figure is as high as 70–80%, but the official rejected those numbers, stating that such a high rate would make the business unprofitable. Based on field observations and meetings with ZOFRI managers, the municipality estimates that about 20–25% becomes waste. ZOFRI, in contrast, claims the figure is much lower—between 3% and 5%.

Customs authorities do not inspect every shipping container entering the area. The number of personnel is limited, and in many cases, containers are opened only if the importer requests it. The municipality does not have authority over customs procedures or the ability to regulate imports. It also cannot legally provide direct funding to private recycling companies unless this is done through a non-profit organization.

The official said that although Alto Hospicio has taken meaningful steps through improved waste collection, surveillance, and educational programs, broader support is needed. Many core issues—including the legal status of textile waste, lack of affordable disposal options, and weak enforcement mechanisms—can only be addressed through coordinated action at the national level.



Image 6.8: The Municipality of Alto Hospicio building
Source: by author



Image 6.9: Logo CORFO
Source: CORFO, n.d.

Interview with representative from CORFO

The interview was conducted with a representative from the regional department of CORFO, the Chilean Corporation for the Promotion of Production. CORFO is a public agency established in 1939 to lead the country's reconstruction following a major earthquake. Over the decades, it has transformed into Chile's principal economic development institution. Its current work is structured around three main areas: fostering entrepreneurship, promoting innovation in businesses, and improving competitiveness. CORFO operates through various subsidy programs, including non-reimbursable funds for entrepreneurs and companies, as well as credit lines and guarantees provided in collaboration with commercial banks.

To support early-stage startups, CORFO offers instruments such as **Semilla Inicia**, providing up to CLP 17 million to help entrepreneurs develop innovative ideas into working prototypes. More advanced ventures can apply for **Semilla Expande** and **Escalamiento**, which provide additional funding for scaling and commercialization. In parallel, the **Viraliza** program is used to stimulate local entrepreneurial ecosystems through events, training, and exposure to international expertise. These tools are complemented by support for innovation in existing firms and by broader initiatives to strengthen sectoral capabilities and technological infrastructure. One such effort is the regional Center for Circular Economy, which is being developed with USD 20 million in funding—USD 9 million of which comes from CORFO.

In relation to the growing issue of textile waste, CORFO has supported multiple initiatives. One of the most prominent is **Runway Fashion Design* (RFD)*, a project initiated in response to widespread media attention on the massive volumes of discarded clothing accumulating in the region. The initiative was introduced by a local consultant representing designer Agatha Ruiz de la Prada. Through the **Viraliza** program, CORFO financed a major event where Ruiz de la Prada and other international designers collaborated with local seamstresses and design students to create fashion from discarded textiles. The event was held at Playa Cavancha and was intended to inspire entrepreneurial projects focused on sustainable fashion.

Following this, CORFO approved a second **Viraliza** event under RFD, as well as a training component involving 30 participants. The representative noted that several concrete results have emerged. One participant has launched a clothing line after studying abroad, while others have pursued further opportunities in Santiago or locally. CORFO has also supported more industrial approaches to textile reuse. A Turkish company based in the Zona Franca (ZOFRI) has invested in machinery and facilities to produce mattress filling from textile waste. Meanwhile, Recitex, a firm with more advanced technology, is working on converting used textiles into materials for road construction and agricultural sponges. CORFO explored offering Recitex a green credit to support its infrastructure investment, although the project has not progressed in recent months.

The interviewee emphasized that the region faces an estimated 40,000 to 50,000 tons of textile waste annually. While high-visibility initiatives like RFD generate awareness and some entrepreneurship, their capacity to reduce overall waste volumes is limited. The interviewee expressed concern about the lack of infrastructure, coordination, and bureaucratic inefficiencies that hinder systemic solutions. He stressed the need for more science, technology, and agile procedures to address the scale of the problem effectively.



Image 6.10: Entrance to the ZOFRI Punto Limpio
Source: by author

Interview with recycling professional

The interview was conducted with a recycling professional who works at the punto limpio of ZOFRI. In her role, she was also actively involved in the development of the Ley REP (Extended Producer Responsibility law). Her insights provide a critical perspective on the gaps, challenges, and potential improvements in the implementation of waste management, especially in relation to textile waste in the Tarapacá region.

The Ley REP assigns responsibility to producers for the waste generated from their products under the principle “the producer pays.” However, the recycling professional stresses that consumers also generate waste through consumption and must be made aware of their role in transporting this waste to clean points or recycling centers. While the law currently prioritizes six product categories, textiles are notably absent, despite the large volumes of used clothing entering Tarapacá annually through the port and Zona Franca (ZOFRI).

She explains that during the drafting process of the law between 2010 and 2012, she and other recyclers, particularly from regions like Tarapacá, advocated for a broader waste law that would include textiles. However, because the problem was not shared nationally, textiles were excluded. The lack of recognition for region-specific issues—such as the influx of imported second-hand clothing due to Tarapacá’s port and free trade status—resulted in a legislative framework that did not address the local waste crisis.

According to the recycling professional, much of the imported clothing is not commercialized and eventually becomes waste. Due to high landfill costs and limited infrastructure, this waste is often disposed of illegally in hills and remote areas. When these sites are shut down through inspections, new dumping sites emerge. This cycle of informal disposal continues in the absence of a traceable and regulated system. She emphasizes the need to address the problem from the origin—controlling imports at the port, identifying where the goods go, and establishing responsibility for what is not sold.

A key challenge is the lack of traceability in the system. Once clothing bales enter ZOFRI and are distributed, there is no follow-up on their destination or final use. If a bale is partially sold and the rest discarded, no one is accountable, and the waste often ends up in illegal dumping sites. The recycling professional also notes that while health regulations require imported goods, including textiles, to be fumigated, there is insufficient oversight of this process. She argues that the Ministry of Health should be more involved in ensuring that the sanitation and safety of imported goods are monitored consistently.

The interviewee highlights the importance of institutional involvement. She criticizes the lack of coordination and foresight during the five-year “marcha blanca” following the law’s promulgation in 2017. During this period, recyclers could certify themselves without cost, and the state had the opportunity to develop infrastructure and communication strategies. However, due to limited dissemination of information, many recyclers missed this opportunity, and the necessary preparation—such as establishing collection centers and acquiring equipment—did not occur.

She points to ongoing issues, such as the absence of designated drop-off locations for textile waste. Citizens often have no place to bring clothes they no longer use, which results in informal disposal. She proposes that textile-specific puntos limpios be created, just as they exist for packaging. These sites could be organized by type of garment and material, with on-site processes for further sorting and

reuse. According to her, communities are already capable of adhering to sorting standards, as demonstrated by existing clean points for packaging materials.

A private company is currently developing a facility to recycle unusable textiles into yarn. However, the recycling professional expresses concern that this initiative lacks transparency and stakeholder inclusion. Long-time textile recyclers, who have supported their families by collecting, washing, and selling second-hand clothing, are not formally included. She stresses that these recyclers must be part of any systemic solution to avoid undermining their role and livelihood.

She also notes that waste generated at the household level—such as discarded clothing, furniture, and electronics—lacks an official disposal route. Residents often resort to leaving such items in public spaces. The professional calls for greater institutional support to provide accessible drop-off points for all types of waste, including electronic and bulky items.

Furthermore, she argues for the state to provide recyclers with workspaces through comodato (use agreements without ownership). Many recyclers, including herself, do not seek to own land but need secure, accessible spaces to carry out their work. Without such spaces, grassroots recyclers risk being pushed aside by private enterprises with greater capital, which could monopolize the sector.

She explains that Tarapacá's situation differs significantly from other regions due to its port and Zona Franca. The easy access to low-cost goods results in higher consumption and faster turnover of items like vehicles and electronics, which contributes to increased waste. The region's diverse and mobile population—many of whom came for work—further complicates waste management practices and public engagement.

In closing, the recycling professional emphasizes the urgency of establishing traceability from the point of entry, ensuring institutional accountability, and developing inclusive infrastructure. She argues for reduced consumption, greater reuse and repair practices, and recycling only as a last resort. Solutions must include and support those already engaged in recycling work, particularly those who have been doing so without state support for many years. Without such measures, the environmental and social consequences of unmanaged textile waste in Tarapacá will continue to escalate.



Image 6.10: The team of recycling professionals at the ZOFRI Punto Limpio
Source: by author



Image 6.11: Logo of the circularity scanner project.
Source: CircularTec, n.d.

CircularTec

The representative from CORFO arranged a meeting for me at the Centro Tecnológico Economía Circular, or CircularTec, which is a project sponsored by CORFO. Here I met with two staff members and an intern.

The CircularTec is dedicated to “promoting collaborative research, development and innovation between industry, academia, government and the territory based on the circular economy model, to generate economic, social and environmental value in the northern macro-zone of Chile” (CircularTec, n.d.). Therefore their projects focus on a variety of topic regarding the transition toward a circular economy, including waste management but also sustainable logistics and solar energy. An example of a project is the ‘Escaner Circularidad Tarapacá’, which aims to identify opportunities for a more circular economy in Tarapacá by 2030.

Talking about the textile waste in the desert, they explained that the idea of going to the landfills to pick out clothing has been romanticized, whereas in reality it is quite hazardous and unsanitary, as there are many rats and other health risks.

Regarding involved stakeholders in the solution to the problem they mention NGO’s like Desierto Vestido and Reverdesierto, but also companies that use textile waste as resource, including Hauipe, an enterprise located in Santiago that produces wipes and cleaning cloths from recycled textile, and North Clothes, an enterprise located in Arica. However, here in Iquique there is not any company recycling textile since, Procitex/Ecofibra left to seek business opportunities for growth elsewhere. They explain that the Free Zone in a way also complicates business, as any production within the area cannot be distributed to outside the zone without first paying import tax. In this way the production and distribution of products is punished, affecting profitability.

Furthermore we discussed the workings of the market of second hand clothes in the area. They told me that Iquique, in addition to the formally established market called El Agro has a free market six days a week, changing location. In spite of this there this is a significant prevalence of something called ‘coleros’, which are unregulated vendor stalls in public space. The municipality wants to get rid of them, because they are often situated inconveniently partially blocking the way or even entrances. However, it is a complicated issue, because a lot of people generate an income this way and the municipality doesn’t want to cut of peoples’ livelihood.

Sustainability director ZOFRI S.A.

In a very brief meeting with a sustainability director of ZOFRI S.A. I asked about how ZOFRI positions itself regarding the issue of the textile waste accumulation in the desert and what role it sees for itself with the respect to a solution for that problem. In response, the director explained that ZOFRI S.A., in fact is a company like any other, meaning it is not obliged to take into account any environmental concerns beyond legal requirements which, he assured me, are duly met. However, he continued, as a company they care for their clients, who have in recent years suffered reputational damage due to global attention for the issue. To mitigate this, ZOFRI S.A. has adopted a collaborative attitude towards the municipality of Alto Hospicio and other initiatives such as RunWayFashionDesign and Estilo Compartido, a clothing exchange event held at ZOFRI. Moreover, they are working on the realization of a textile recycling facility with one of their clients.



Image 6.11: Logo of Feria Estilo Compartido
Source: estilocompartidoiqq, 2025

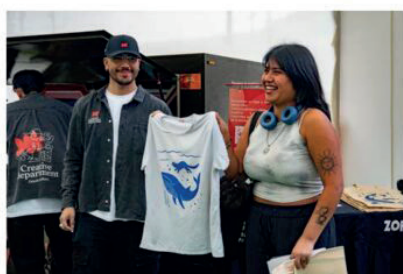
Exitosa tercera versión de Feria Estilo Compartido:

Estudiantes universitarios y ZOFRI S.A. reciclan 150 kilos de ropa y propician el intercambio de 1.159 prendas

La recolección de un total de 150 kilos de ropa en desuso y el intercambio de mil 159 prendas que ahora tienen una nueva vida, son parte de las cuentas alegres que dejó la Feria "Estilo Compartido: Textiles que renacen". Una iniciativa impulsada por la carrera de Ingeniería Comercial mención en Gestión y Comercio Exterior de universidad regional la que desde hace dos años, cuenta con el respaldo de ZOFRI S.A.

"Estilo Compartido es una iniciativa que nace en las aulas de Ingecox como un proyecto de la asignatura de Responsabilidad Social Empresarial, la que persigue el objetivo de fomentar la economía circular a través del intercambio de prendas en buen estado, desarrollar competencias de planificación, gestión y marketing sostenible en los estudiantes; fortaleciendo los vínculos entre la academia y los organismos locales", sostuvo Jeamsie Herrera Parraguez, Jefa de Carrera de Ingeniería Comercial, quien agregó que la idea es generar conciencia sobre la urgencia de un consumo de ropa responsable, promoviendo, desde la educación superior, una ciudadanía más crítica, comprometida y sustentable.

Por su parte el Presidente del Directorio de ZOFRI



S.A., Iván Berrios Camilo, señaló que gracias a estas intervenciones abiertas a la comunidad, la consolidación de puntos limpios en las dependencias del recinto franco y todas las acciones destinadas a promover el reciclaje, la producción responsable y el consumo consciente, se mantiene un objetivo primordial: garantizar un equilibrio entre el crecimiento económico, el cuidado del medio ambiente y el bienestar social.

"Nosotros también queremos ser parte de la solución y ayudar a contener la expansión de vertederos textiles. Un problema a nivel planeta al que nos vinculan desde el desconocimiento, pues si bien la ZOFRI importa

ropa de vestir, no es la responsable de que las prendas terminen en basureros o desperdigadas en el desierto", señaló Berrios, quien enfatizó en la importancia de desmitificar que ZOFRI es un agente contaminante.

"Vamos a seguir impactando, pero desde la vereda de la producción y la búsqueda de soluciones para todo lo que tenga que ver con innovación y sus consecuencias reales en la calidad de vida, pues no queremos que nuestro suelo, el aire y el agua sufran las consecuencias de inescrupulosos que buscan sacar réditos de actos que ocurren mucho después de que salen desde nuestras dependencias", indicó Berrios,



TELEVISIÓN NACIONAL

En la nueva versión de la feria que fomenta la sostenibilidad, la creatividad y la economía circular a través de la reutilización y resignificación de prendas textiles, también se realizaron múltiples servicios de limpieza y restauración de ropa y calzado.

Además, los creadores del Estudio de diseño y serigrafía RedLab estamparon gratuitamente un total de 50 prendas con iconos de la

flora y fauna local, dando un toque especial al proyecto que también contó con la participación de cuatro usuarios de Zona Franca: Marifet Limitada, Recitex (Grupo Bayram), Importadora Casa de Ropa limitada e Importadora Sardes Limitada.

Finalmente, la jornada realizada en el estacionamiento del Mall Zofri, contó con la participación de integrantes del programa "Chile Circular" que conduce Jennifer Boldt, por lo que muy pronto podrá ser vista en las pantallas de televisión



Image 6.12: Newspaper article reporting successes of the third edition of the Feria Estilo Compartido
Source: El Longino, 2025



Image 6.13: Inside used textile importer warehouse
Source: by author

Used textile importer

In a large warehouse of an importer in the ZOFRI I spoke to a sales manager. He explained how their operation works. From this warehouse he sells bales at hundreds and they go everywhere, to La Quebradilla, to Santiago, to Peru, to Bolivia. Even though it is illegal to import used clothing into Bolivia. The workaround always arises as soon as the prohibition does, he told me.

The result of business negotiations with their providers abroad there is always a certain quantity of third quality bales included. They do not let them buy only first and second quality bales. Anyways, as they do not do any sorting (other importers do) they do not have any leftovers. They sell the bales and what happens with the textiles in them after that is out of their hands.

Local fashion designer

I met with an inspiring local fashion designer. She won the RFD challenge 2024 in collaboration with two Aymara (indigenous people of the Tarapacá region) women. Their work combined tradition with a sustainable and conscious approach, using ancestral techniques and textile waste recovered from landfills in the desert.

She explained that for this particular project they went to dump sites to search for useful textiles in a bigger group. Usually, however, she works with materials she rescues from markets like La Quebradilla, because going to the landfills is not particularly safe, especially if you go alone.

In her atelier she tries to reuse every scrap of textile. The bigger ones by integrating them into patchwork designs and the smaller ones she uses as filling for heart shaped pillows which she gifts to clients, for whom she designs clothing for special occasions or redesigns cherished items that now longer fit.

She also talked about how as a child she already edited her clothes, to the frustration of her mother who had bought those clothes, and about how when she was younger people used to have a negative image of what it meant to wear second hand clothes. That has changed now. For her clients she sometimes also organizes clothing exchange events.



Image 6.14: Atelier of a local fashion designer
Source: by author

Dance instructor at Semillarból

Getting to know the city center of Alto Hospicio I tried to visit the CCAHo, Centro Cultural de Alto Hospicio, but it was closed due to renovations. Close by I did find another cultural center, called Semillarból. This facility had a less formal appearance, matching its bottom-up organization, which a young women who I met here while she was preparing one of her dance classes (hiphop and reggaeton), explained to me giving me a tour around the place. She also told me that this approachable bottom-up character is not necessarily appreciated by the mayor and they fear that the municipality will want to gentrify the plot, because of its central location.

When I told her about my thesis project she responded that anything happens in Alto Hospicio and everyone knows about it. It is a place with a lot of illegality, stubbornness and vulnerability. She emphasized that La Quebradilla with its clothing is a central economic source in the local culture, and even during the COVID pandemic, in spite of prohibition, the market started up again after a few days of suspension.



Image 6.15: CCAHo
Source: by author

She told me it is a good thing that everything is very accessible around here, for example the clothes are very cheap, so that young people can easily express their individual style. Unfortunately, she added, drugs are also very accessible.

She said that there is little culture in Alto Hospicio, in contrast to Iquique, which she knows very well because she grew up there, but due to economic hardship she and her parents moved to Alto Hospicio. Through this self-managed cultural center, they are trying to contribute to fostering cultural awareness in this vulnerable community.

My friendly contact in Iquique

Some of my friends used to go 'shopping' sometimes at one of those clothing dump sites where the 'owner' charged an entrance fee and you could take what you liked.

My host in El Boro, Alto Hospicio

Here, the street dogs are more dangerous than the people.

My five year old daughter has asthma. Almost every night you can smell the burning of waste. (It smells like fireworks.) I think she got sick because of the air pollution.

It is very clouded this time of year, because of the 'Invierno Boliviano', Bolivian winter. Still it almost never rains, but when it rains, the rain falls black, leaving the laundry outside dirty.



Image 6.16: Centro Cultural Semillarbol
Source: by author

7. PATTERN LANGUAGE

Pattern design / Development of the patterns / Example pattern per domain / Pattern relations / Stakeholder overview / Timeline

The concept of a pattern language was coined by architect Christopher Alexander in 1977. It consists of a set of patterns that each target a specific problem or aspect of a complex issue. Together a set of patterns enables the emergence of a coherent design. In order to achieve this it is important to structure the patterns and make the relations between patterns explicit.

Each pattern must at least include a title, a hypothesis, a theoretical or empirical back-up, a description of its practical implication, an image and a list of related patterns. Of these basic elements, the most essential part of the pattern is the hypothesis, which connects the 'what', explained in the theoretical or empirical back-up, and the 'how', explained in the practical implication (van Dorst, 2025).

Pattern design

The patterns are designed as double-faced A6 cards. The color of the cards indicates to which domain the pattern belongs. The domains are 'Waste management', 'Regulation and Enforcement', 'Education and Engagement', 'Exposure and Protest', and 'Urban Planning and Design'.

On the front of the pattern cards there is an image representing the essence of the pattern. Below it in large font the title of the pattern and in smaller font the hypothesis explaining the point of the pattern. Next to the title stands the number that has been assigned to the pattern, which is useful for easy referencing in further use of the pattern language. On the bottom of the front page an indicator scale displays whether a pattern is relevant in particular to the issue of textile waste or other types of waste. When the slider is set into a central position this means the pattern applies to waste in general.

The back side of the patterns contains more detailed information, providing a short theoretical or empirical back-up for the pattern as well as a brief description of the practical implementation. Moreover, some patterns include a warning sign followed by a disclaimer that alerts the reader to any possible conflicts of interest in relation to other patterns or general concerns. Following the explanation of the pattern, a list of relevant stakeholders is mentioned as well as a list of related patterns. Furthermore, a type designation at the top left corner indicates how the pattern is categorized into a typology that distinguishes between the options: Campaign | Enterprise | Event | Infrastructure | Policy | Product | Spatial Intervention. At the top right corner, the scale of impact of the pattern is specified on the following range: Site | Neighborhood | City | Region | Macroregion | Country | Continent | World. Finally, an overview of sources on which the pattern is based is provided at the bottom, including the mentioning of 'Fieldwork' and 'Interview' in addition to literature sources.

IMAGE

TITLE

Hypothesis

Textile waste

Other waste

#

Type: Campaign | Enterprise | Event | Infrastructure | Policy | Product | Spatial Intervention

Scale of impact: Site / Neighborhood / City / Region / Macroregion / Country / World

Theoretical or Emperical Back-up

Practical Implementation

! Attention

Any risk or conflict related to the pattern, if relevant.

Stakeholders

1 | 2 | etc.

Related Patterns

#

#

#

#

#

#

Sources: Fieldwork | Interview | Literature

Waste Management
Regulation and Enforcement
Education and Engagement
Exposure and Protest
Urban Planning and Design

155/203

Development of the patterns

Category definition

The development of the pattern language started by making a list of all individual efforts and interventions against the occurrence of clandestine landfills and micro dumps in Alto Hospicio and Iquique I had come across during my research so far. In this first set of patterns I then defined categories by grouping together patterns based on common factors.

These categories then helped me to add more patterns by trying to remember more related practices to the domain of each category. While adding more patterns, I realized that categorization became a bit blurry and needed to be revised. This was an iterative process that repeated itself several times.

Emphasis by specificity

Simultaneously to the redefining of the categories, patterns were eliminated, added or adapted. Decision making in this process was determined by the relevance of a pattern from the point of view of this project as an urbanism thesis. Thus, a higher degree of specificity was dedicated to patterns with concrete spatial implications, determining the emphasis of the pattern language as a whole.

Reversely, patterns with less spatial relevance were reduced and compiled. For example, there are many cases of startups recycling textile waste into new products. At first, I dedicated an individual pattern to each of them under a category called 'reproduction'. During one of many rounds of revision, however, I decided to group them all together into one single pattern called 'products from recycled textile' (nr.11). This decision was based on the limited relevance of the differences between the various business and products for an overview of how spatial and non-spatial interventions can tackle the textile waste management crisis in Tarapacá. What matters from this perspective is that textile waste is being reproduced into new products, rather than what those products are.


Another category that underwent a severe reduction and compilation is that of 'Exposure and Protest', in previous stages titled 'Exposure and Activism'. Initially, I developed separate patterns for individual artworks, fashion shows and documentaries. Realizing however that the number of patterns would be infinite if I continued in this way and even more importantly, that the relevance of each pattern with regard to universality and transferability was rather limited, I decided to formulate more abstract patterns within this domain, categorizing these mostly activist efforts into only five patterns:

- 'Picture or it didn't happen' (nr. 35), which includes all efforts to visually **expose** the damage;
- 'Story telling' (nr. 36), which includes all efforts to **explain** what is happening;
- 'Art projects' (nr. 37), which includes all efforts to abstractly **critique** the situation and stimulate others to think critically about their role in the bigger picture;
- 'Law suit' (nr. 38), which includes all efforts to legally **demand** action from responsible institutions and organizations;
- 'Fashion show' (nr. 39), which includes all efforts to **challenge** the status quo and dominant players that uphold it by demonstrating possibilities for alternative ways.

Pattern evolution

Individual patterns also evolved during the process of revising the structure of the total set, generally in favor of increasing nuance and sensitivity to the local context. For example, 'Prohibit import of used textiles', became 'Import restriction for used textiles' (nr. 20), preventing a future scenario wherein the entire community making a living from trade in used textiles ends up losing their livelihoods. Another example is the adaptation of the suggestion to formally recognize clandestine landfills as official landfills into a less extreme suggestion to declare these sites as contaminated areas that required interventions for containment until a permanent solution to eradicate said contamination can be executed (nr. 43).

Example pattern per domain



WASTE COLLECTION POINTS

Waste collection points provide a way to collect waste sorted by its material nature, making the waste stream suitable for recycling.

Textile waste

Other waste

1

Infrastructure

Neighborhood

Theoretical Back-up

There are a few waste collection points in Iquique and Alto Hospicio known as "Punto Limpio" / "Punto de Acopio" / "Punto Verde".

Increasing the amount of collection points increases their proximity to residents making them more accessible which will stimulate the use of this infrastructure and thus result in a higher collection rate of sorted waste.

Practical Implementation

A network of strategically placed collection points in meaningful relation to adjacent functions:

- at a park (according to the project La Ciudad que Queremos)
- at a school (relating to the teaching of recycling)
- at ferias, fairs, markets (as here a lot of waste is generated).

All collection points should be designed look the same, because recognizability is important as well as visibility.

Attention

Not all collection points accept all sorts of waste.

Stakeholders

MIQQ | MAHO | ZOFRI | schools | fair administrators

Related Patterns

2 4 18 25 27 47

Sources: Fieldwork | (Corporación Ciudades, n.d.-b)



IMPORT RESTRICTIONS FOR USED TEXTILES 20

Prohibiting the import of class III (the lowest quality class) used textile reduces the amount textile waste in the region.

Textile waste

Other waste

Policy

Country

Theoretical Back-up

In the absence of strict quality regulations, a large portion of imported used textiles is effectively textile waste.

Practical Implementation

Used textiles are typically classified into three quality categories, with first quality including nearly new or unused returned purchases. The Ministry of the Environment (Ministerio del Medio Ambiente) is currently considering a ban on the import of third-quality textiles, which are often in poor condition and likely to become waste.



Attention

The option of prohibiting all import of used textile is also being considered. However, this would have a severe impact on the economy of Iquique and Alto Hospicio where a lot of people make a living from the import and trade of used textile. Also, there is a conflict of interest between this pattern and patterns 8 & 11, which rely on the import of textile waste for recycling.


Stakeholders

MMA | Importers of used textiles | Customs control (Audana)

Related Patterns



Sources: (Ministerio de Medio Ambiente, 2025)



PARTICIPATIVE INTERVENTIONS 29

Inviting citizens to take part in the execution of spatial improvements, such as the planting of flowers and trees in a park or a beach clean-up, reinforces citizens attachment to their living environment, fostering a sense of care.

Textile waste

Other waste

Event | Spatial Intervention

Site

Theoretical or Emperical Back-up

Inviting citizens to participate in the caretaking of their living environment, for example by planting vegetation in an urban park promotes the importance of care for the environment. Another example of a participative intervention is a *Jornada de Limpieza* or (beach) clean-up. In order to improve the quality of life in cities, the commitment of the inhabitants themselves is fundamental. This type of initiative seeks to incorporate them so that they feel they are active agents of their own city and environment.

Practical Implementation

On April 1st 2023, over 70 people took part in a vegetation planting activity at the Santa Rosa Urban Park. On April 11th 2025, ZOFRI S.A. led a beach clean up at El Colorado.



Attention

To ensure viability of the vegetation in this desertic landscape native species were chosen including trees such as Algarrobo and Molle, and flowering ground covers such as doquillas and sun rays.

Stakeholders

NGO (Reverdesierto) | Corporación Ciudades | Municipalities (MAHO, MIQQ) | Sponsors (ZOFRI S.A.) | participants

Related Patterns



Sources: (Corporación Ciudades, 2023) | (El Sol De Iquique, 2025)



FASHION SHOW

39

The organization of fashion shows that focus on the topic of textile waste by showcasing only pieces made from reused materials or even hosting the event amidst a textile landfill, challenges the dominant culture of wastefulness in the industry.

Textile waste

Other waste

Theoretical Back-up

Atacama Fashion Week is “a cry for help from the planet to the fashion world” organized by Desierto Vestido and Fashion Revolution inviting anyone and everyone to “look at what the fashion industry refuses to see.”

Practical Implementation

The event took place in April 2024 and featured a fashion show with eight outfits designed by Mauricio Nahas, using the world's largest fashion landfill as a runway. It also included six podcast episodes, a panel discussion, an online tool encouraging consumers to challenge big brands to assume responsibility, and ‘price tags’ demonstrating that ‘no matter how much an outfit costs, the environment always pays the highest price,’ such as: ‘500,000,000,000 USD in wasted clothing, rarely worn, rarely recycled.’

Subsequently, media outlets from more than 20 countries around the world picked up on the event and featured it, helping to achieve a global audience.

Stakeholders

Runway Fashion Design | Desierto Vestido | Fashion Revolution | Fashion designers | Worldwide media outlets

Related Patterns



Sources: (Atacama Fashion Week, 2024)



FROM DUMP TO PARK

40

By transforming a dumpsite into a park the risk of recurrence of waste dumping on that site is mitigated, making the effort of cleaning worthwhile, while also giving a boost of positivity to the imaginary of the city inviting citizens to look differently at their living environment, stimulating a sense of care.

Textile waste

Other waste

Spatial Intervention

Site | City

Theoretical or Empirical Back-up

The municipality of Alto Hospicio faces difficulties in securing funding from higher-level government institutions for clearing illegal dumpsites, as these institutions rightfully suspect that dumping may resume after cleanup. Transforming a cleared dumpsite into a public park helps mitigate this risk by preventing future waste accumulation through active community use. Additionally, such transformations contribute to a more positive public image of the city, fostering a renewed relationship between residents and their environment.

Practical Implementation

The Imagen Objetivo of the Improved Urban Livability plan for Iquique and Alto Hospicio, developed by Corporación Ciudades, includes a proposal to convert the littered cliffside into an extensive urban park. This plan envisions an expansion of the existing Parque Los Cóndores.



Attention

Not every dumpsite might be a suitable location for a park.

Stakeholders

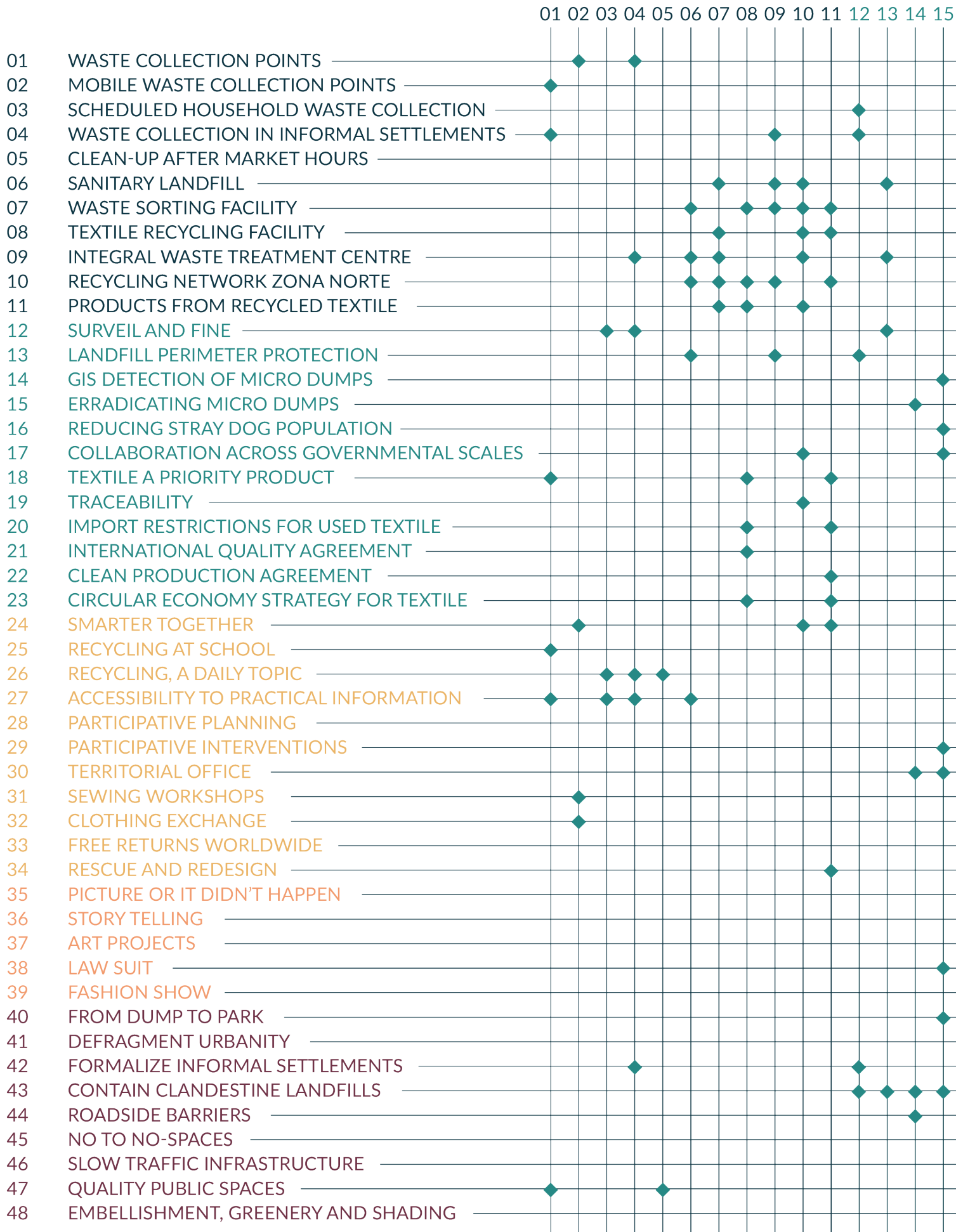
Municipalities | Urban and landscape designers

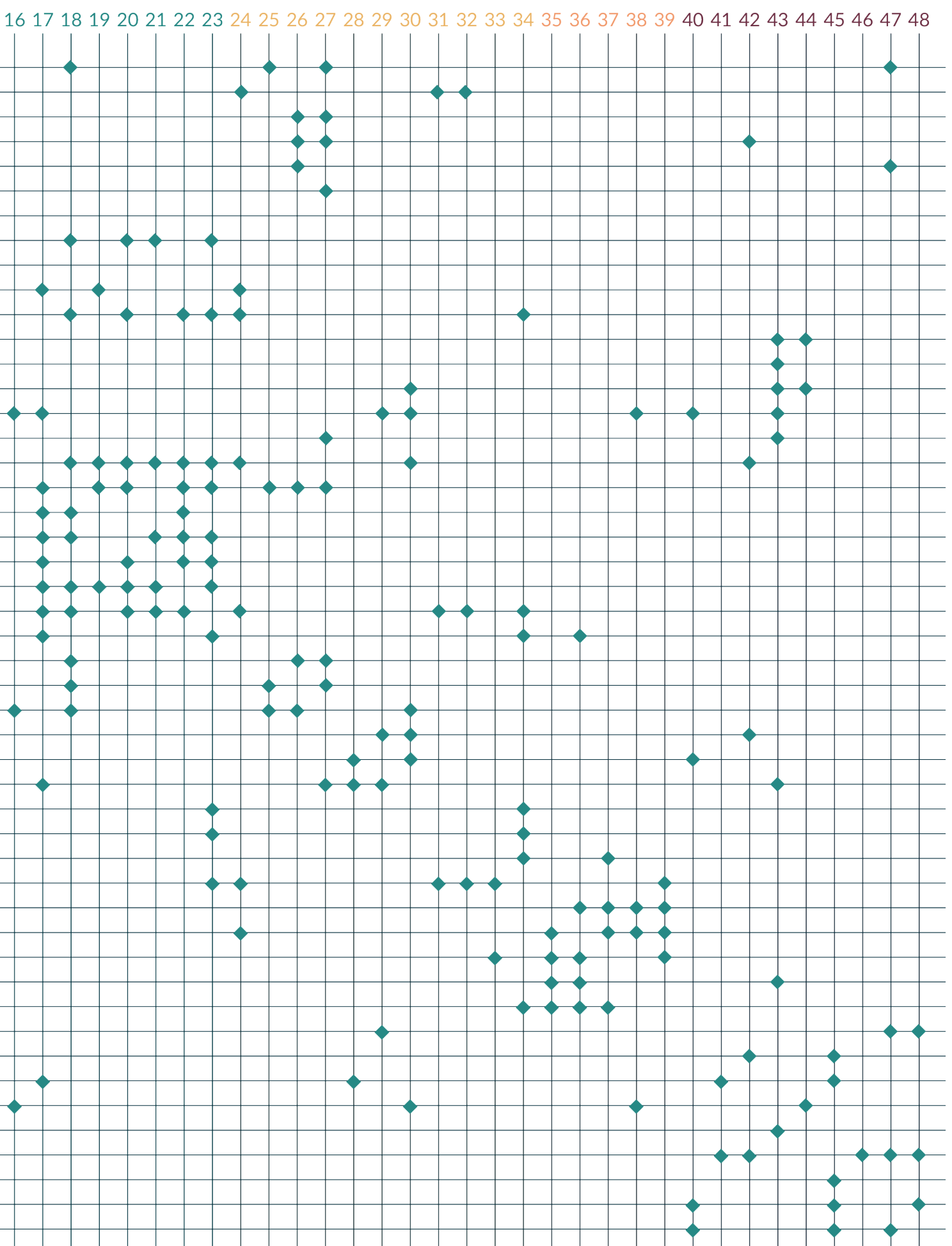
Related Patterns



Sources: Interview Official MAHO | (Corporación Ciudades, n.d.-d)

Pattern relations





Stakeholder overview

Sector	Role	Stakeholder by name
Public	International governmental institution	UN
		EU
	National government	Gobierno de Chile
		Foreign national governments
	Ministries	MMA
		MINVU
		MOP
		Bienes Nacionales
		Mineduc
	Regional governmental institutions	GORE Tarapacá
		AM IQQ-AHO
		SERVIU
		SMA
		SEREMI
	Municipalities	MIQQ
		MAHO
	Court	Primer Tribunal Ambiental
	Customs control	Servicio Nacional de Aduanas
	Sponsors	CORFO
		CircularTec
Private		ZOFRI S.A.
		CChC
		Collahuasi Foundation
	NGO	Desierto Vestido
		Reverdesierto
	Sustainable fashion initiative	Runway Fashion Design
		Fashion Revolution
		Trade association Cámara Diseña Sustentable

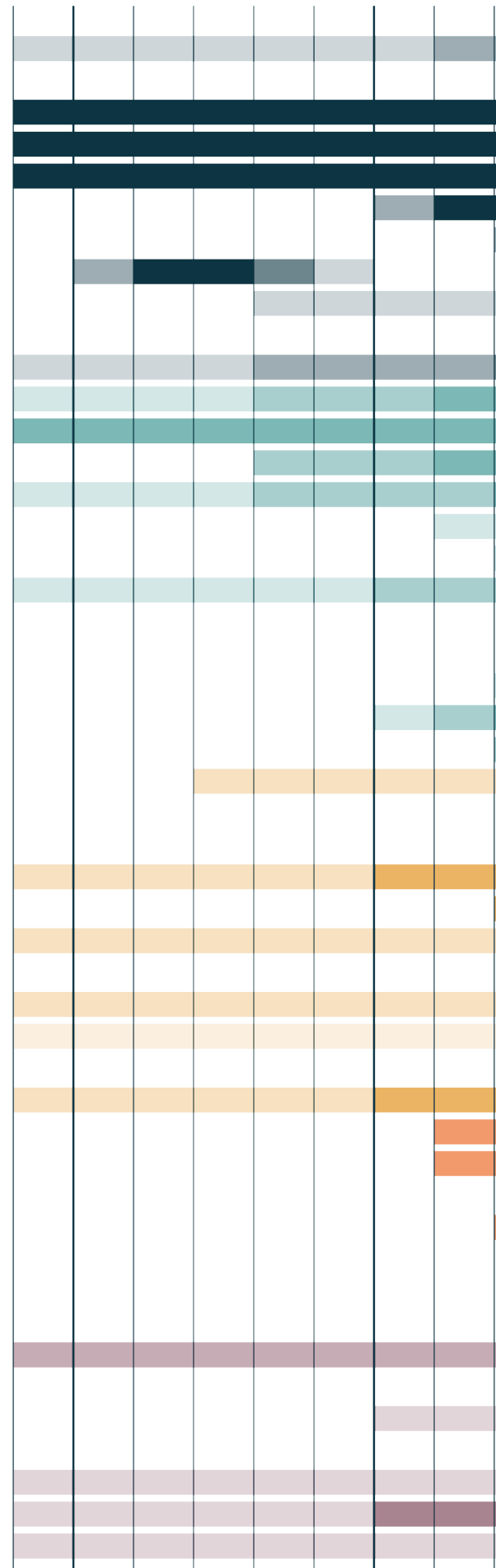
Entrepreneurs in textile recycling	Ecocitec
	Procitex
	Recitex (Bayram Holding)
	Local fashion designer
Recicladores de base	
GRANSIC	ReSimple
Waste management company	Recynor
	Cosemar
Producers of textile	
Importers of used textiles	
Fair vendors	
Fair administrators	
Event hosts	
School boards*	<i>*can also be public</i>
Media outlets	
Photographer	
Journalist	
Documentary maker	
Artists	
Urban (and landscape) planners and designers	Corporación Ciudades
Lawyers	
Civil	Activists
	Community leaders in informal settlements
	Dog owners
	General public as:
	Audience
	Consumers
	Participants
	Residents
	Visitors
	Inhabitants of informal settlements
	Students
	Workforce (Clean-up crew)

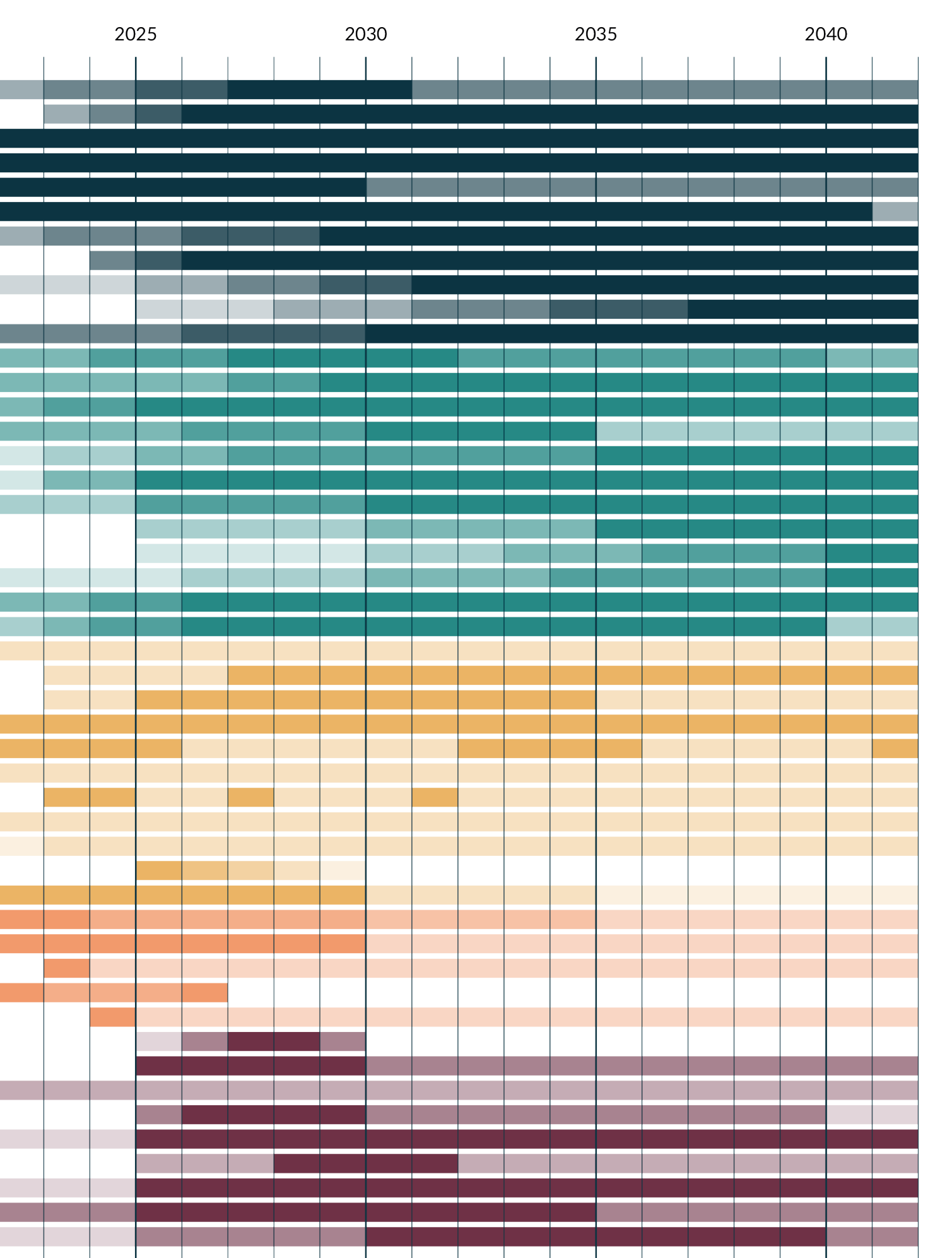
Timeline

2015

2020

- 01 WASTE COLLECTION POINTS
- 02 MOBILE WASTE COLLECTION POINTS
- 03 SCHEDULED HOUSEHOLD WASTE COLLECTION
- 04 WASTE COLLECTION IN INFORMAL SETTLEMENTS
- 05 CLEAN-UP AFTER MARKET HOURS
- 06 SANITARY LANDFILL
- 07 WASTE SORTING FACILITY
- 08 TEXTILE RECYCLING FACILITY
- 09 INTEGRAL WASTE TREATMENT CENTRE
- 10 RECYCLING NETWORK ZONA NORTE
- 11 PRODUCTS FROM RECYCLED TEXTILE
- 12 SURVEIL AND FINE
- 13 LANDFILL PERIMETER PROTECTION
- 14 GIS DETECTION OF MICRO DUMPS
- 15 ERRADICATING MICRO DUMPS
- 16 REDUCING STRAY DOG POPULATION
- 17 COLLABORATION ACROSS GOVERNMENTAL SCALES
- 18 TEXTILE A PRIORITY PRODUCT
- 19 TRACEABILITY
- 20 IMPORT RESTRICTIONS FOR USED TEXTILE
- 21 INTERNATIONAL QUALITY AGREEMENT
- 22 CLEAN PRODUCTION AGREEMENT
- 23 CIRCULAR ECONOMY STRATEGY FOR TEXTILE
- 24 SMARTER TOGETHER
- 25 RECYCLING AT SCHOOL
- 26 RECYCLING, A DAILY TOPIC
- 27 ACCESSIBILITY TO PRACTICAL INFORMATION
- 28 PARTICIPATIVE PLANNING
- 29 PARTICIPATIVE INTERVENTIONS
- 30 TERRITORIAL OFFICE
- 31 SEWING WORKSHOPS
- 32 CLOTHING EXCHANGE
- 33 FREE RETURNS WORLDWIDE
- 34 RESCUE AND REDESIGN
- 35 PICTURE OR IT DIDN'T HAPPEN
- 36 STORY TELLING
- 37 ART PROJECTS
- 38 LAW SUIT
- 39 FASHION SHOW
- 40 FROM DUMP TO PARK
- 41 DEFRAGMENT URBANITY
- 42 FORMALIZE INFORMAL SETTLEMENTS
- 43 CONTAIN CLANDESTINE LANDFILLS
- 44 ROADSIDE BARRIERS
- 45 NO TO NO-SPACES
- 46 SLOW TRAFFIC INFRASTRUCTURE
- 47 QUALITY PUBLIC SPACES
- 48 EMBELLISHMENT, GREENERY AND SHADING





8. THE DESIGN

Selecting patterns / Spatial criteria / Design

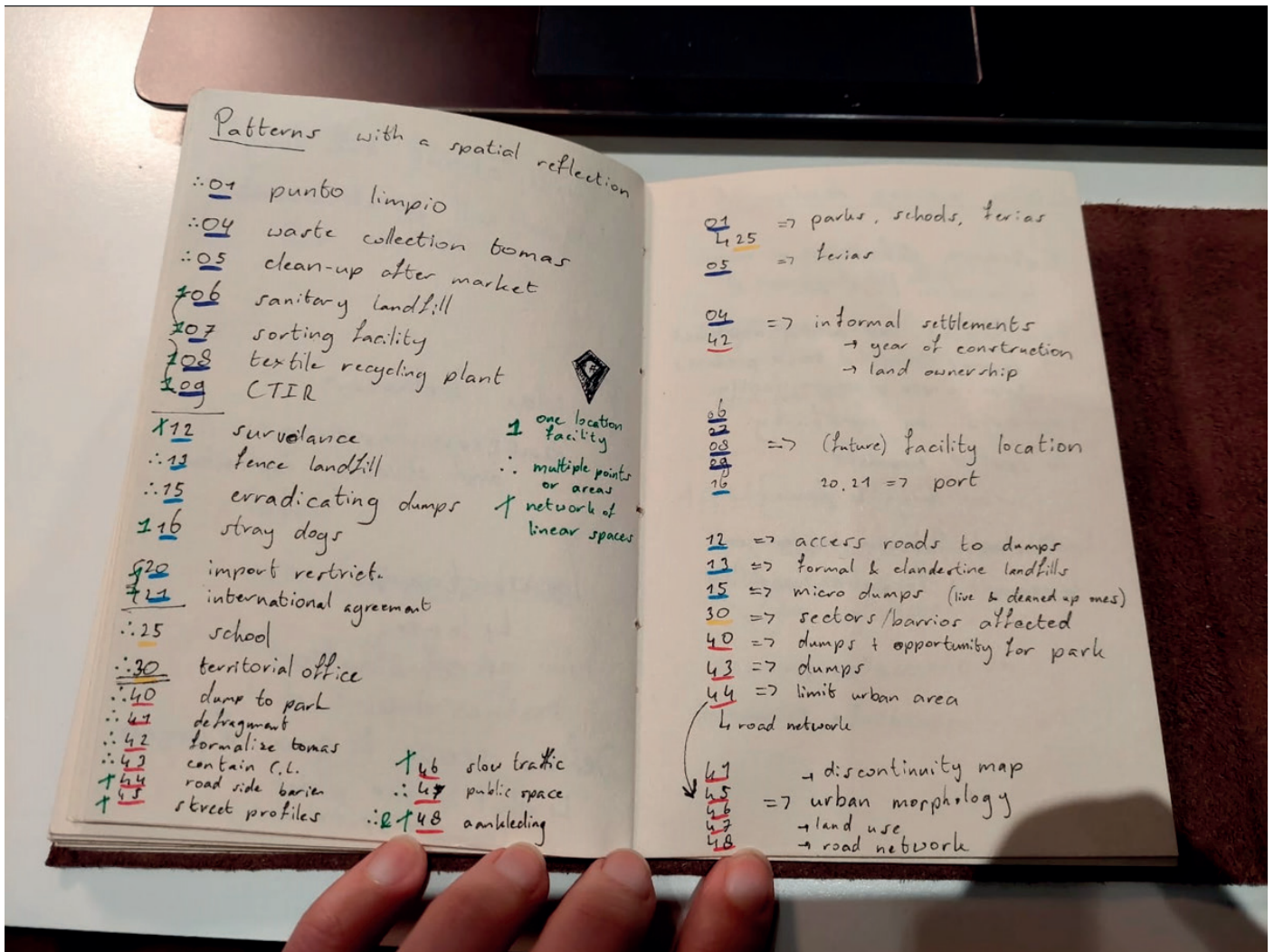


Image 8.1: Identification of patterns with a spatial impact
Source: by author

		clandestine landfills	facility location	informal settlements	limit urban area	markets	micro dumps	neighborhoods	official landfills	parks	port	puntos limpios	road network	schools	urban blocks
1	waste collection points					x				x		x		x	
4	waste collection informal settlements			x											
5	clean-up after market hours					x									
6	sanitary landfill		x												
7	waste sorting facility		x												
8	textile recycling facility		x												
9	integral waste treatment center		x												
12	surveil and fine	x					x						x		
13	landfill perimeter protection	x							x						
15	erradicating micro dumps				x		x								
16	reducing stray dog population		x												
20	import restrictions for used textile										x				
21	international quality agreement										x				
25	recycling at school													x	
30	territorial office	x					x	x							
40	from dump to park	x			x		x			x					
41	defragment urbanity			x		x									x
42	formalize informal settlements			x											
43	contain clandestine landfills	x													
44	road side barriers	x			x								x		
45	no to no-spaces				x								x		x
46	slow traffic infrastructure				x								x		
47	quality public spaces				x	x				x					
48	embellishment, greenery and shading				x					x			x		

Table 1: Data criteria for pattern application
Source: by author

mapping spatial criteria

01 **Waste collection points**

05 **Clean-up after market hours**

25 **Recycling at school**






Puntos Limpio

In addition to existing Puntos Limpio and the locations suggested by Corporación Ciudades in the vision for improved livability in Iquique-Alto Hospicio more Puntos Limpio should added to establish a dense network. Important locations are green areas, schools and ferias.

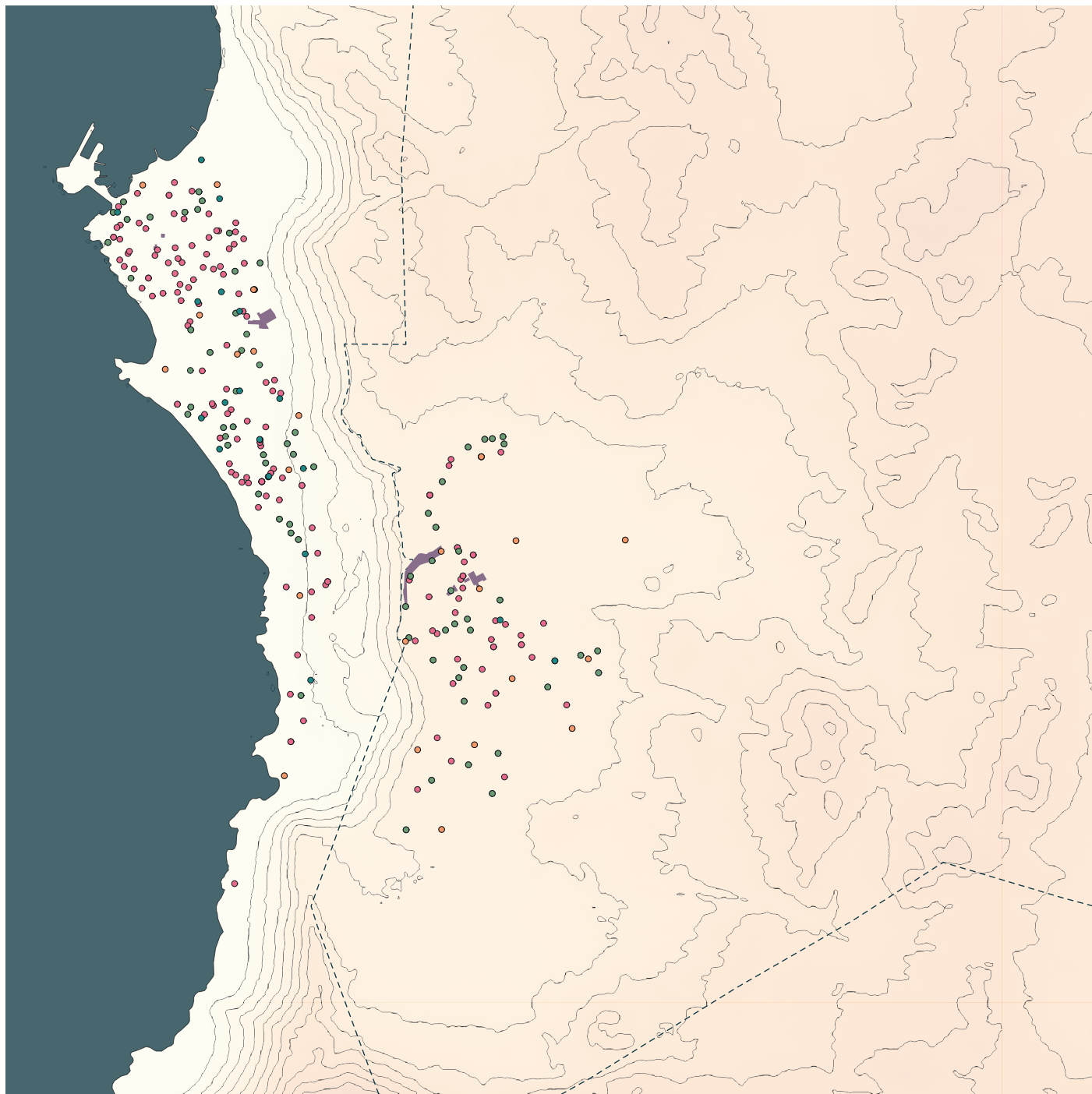
The new Puntos Limpio at schools coincide with the spatial application of teaching recycling at school.

The new Puntos Limpio at ferias coincide with after-hours clean-up. Do note, itinerant ferias are important locations for such clean-up intervention, but are not marked on the map, because they lack a permanent location.

Source: Corporación Ciudades | schools

-  Existing Punto Limpio
-  New punto limpio plan Corporacion C.
-  New Punto Limpio at green area
-  Ne Punto Limpio at school
-  New Punto Limpio at feria

0 1 2 km N
|



04 **Waste collection informal settlements**

41 **Defragment urbanity**

42 **Formalize informal settlements**

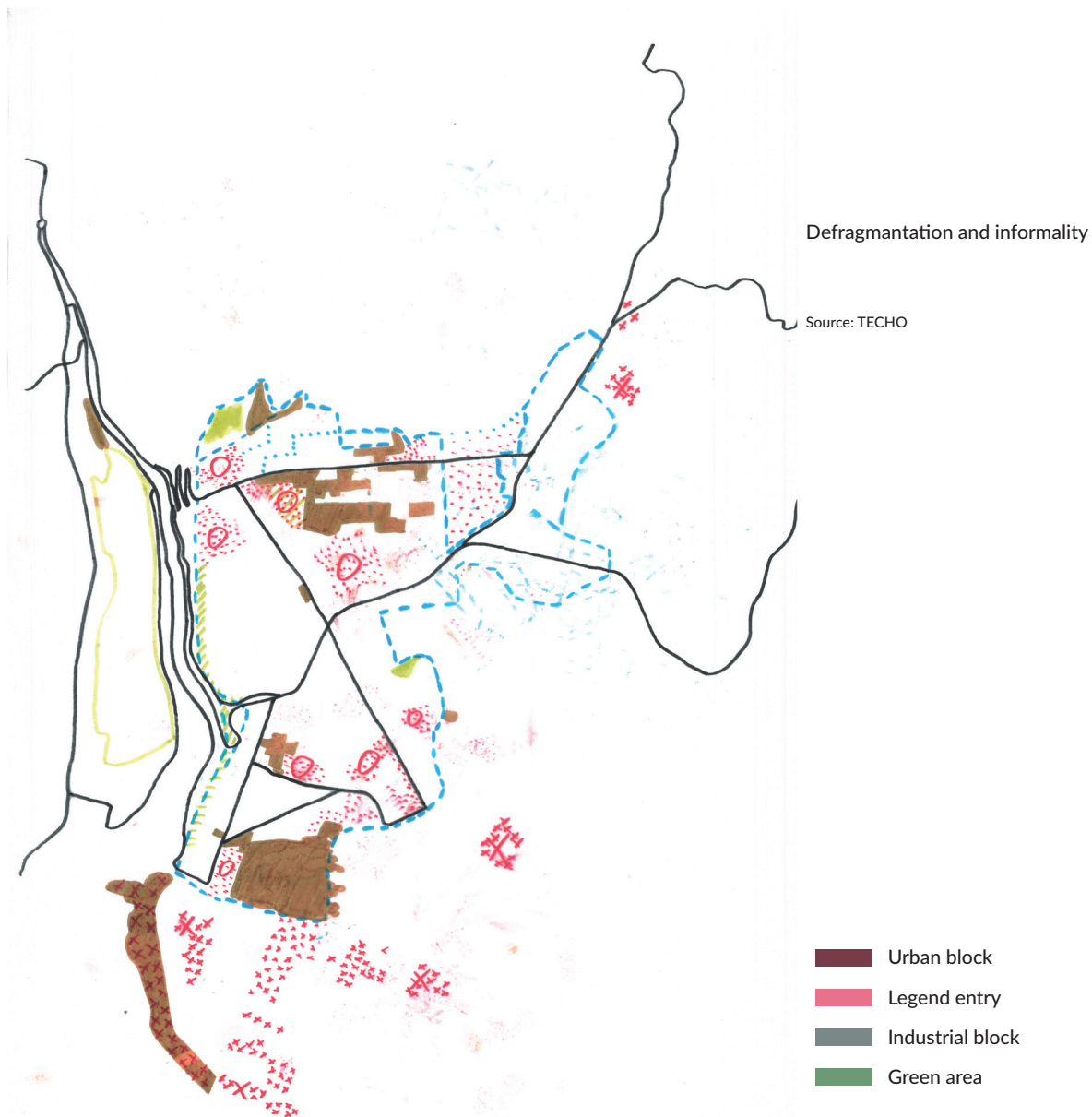
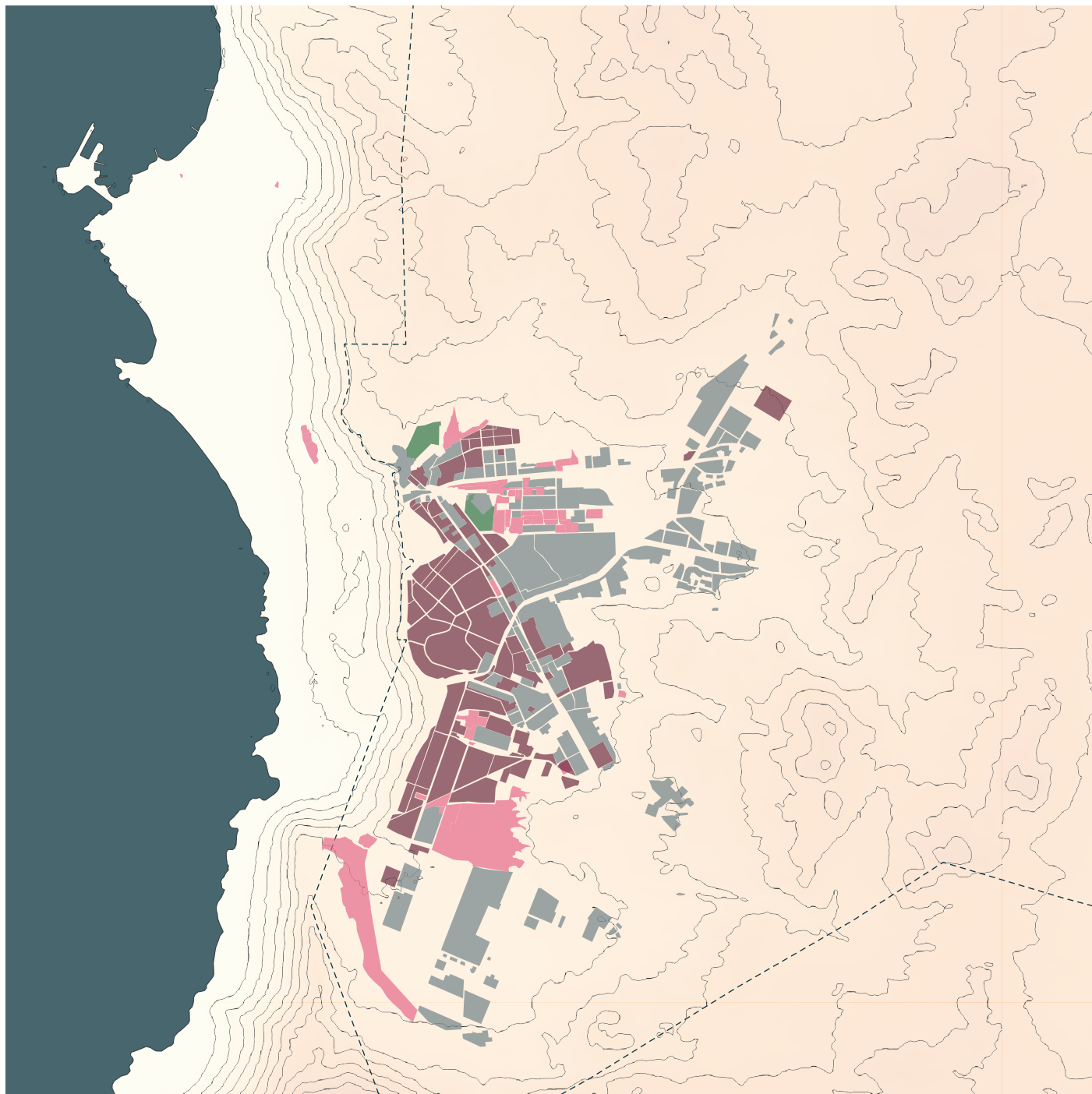


Image 8.2: Mapping fragmentation in Alto Hospicio - handsketch
Source: by author



04 **Waste collection informal settlements**

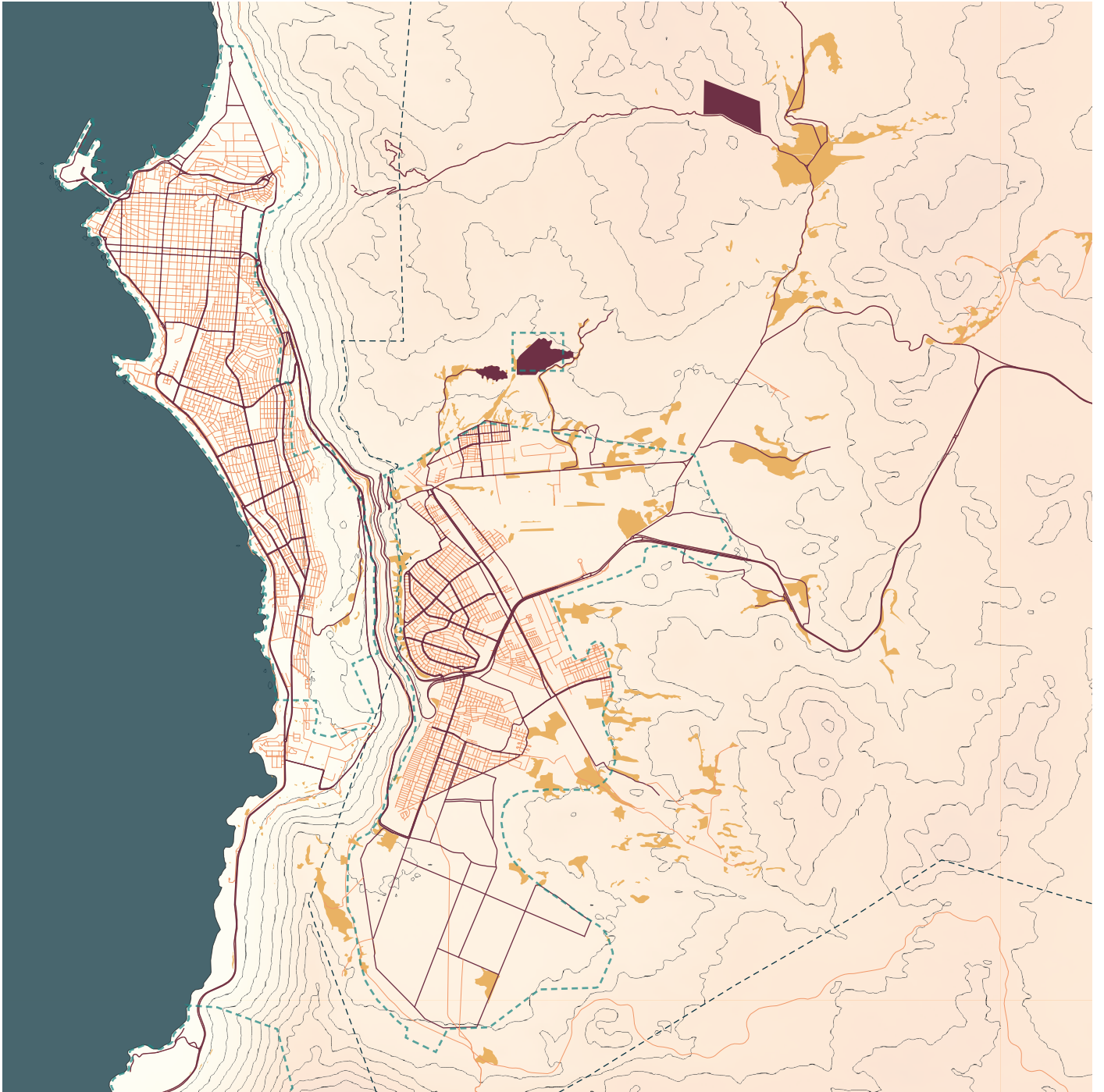
41 **Defragment urbanity**

42 **Formalize informal settlements**

Roads and landfills

- Official landfill
- Clandestine landfill
- Limite urbano PRC
- Secondary road
- Primary road

0 1 2 km N



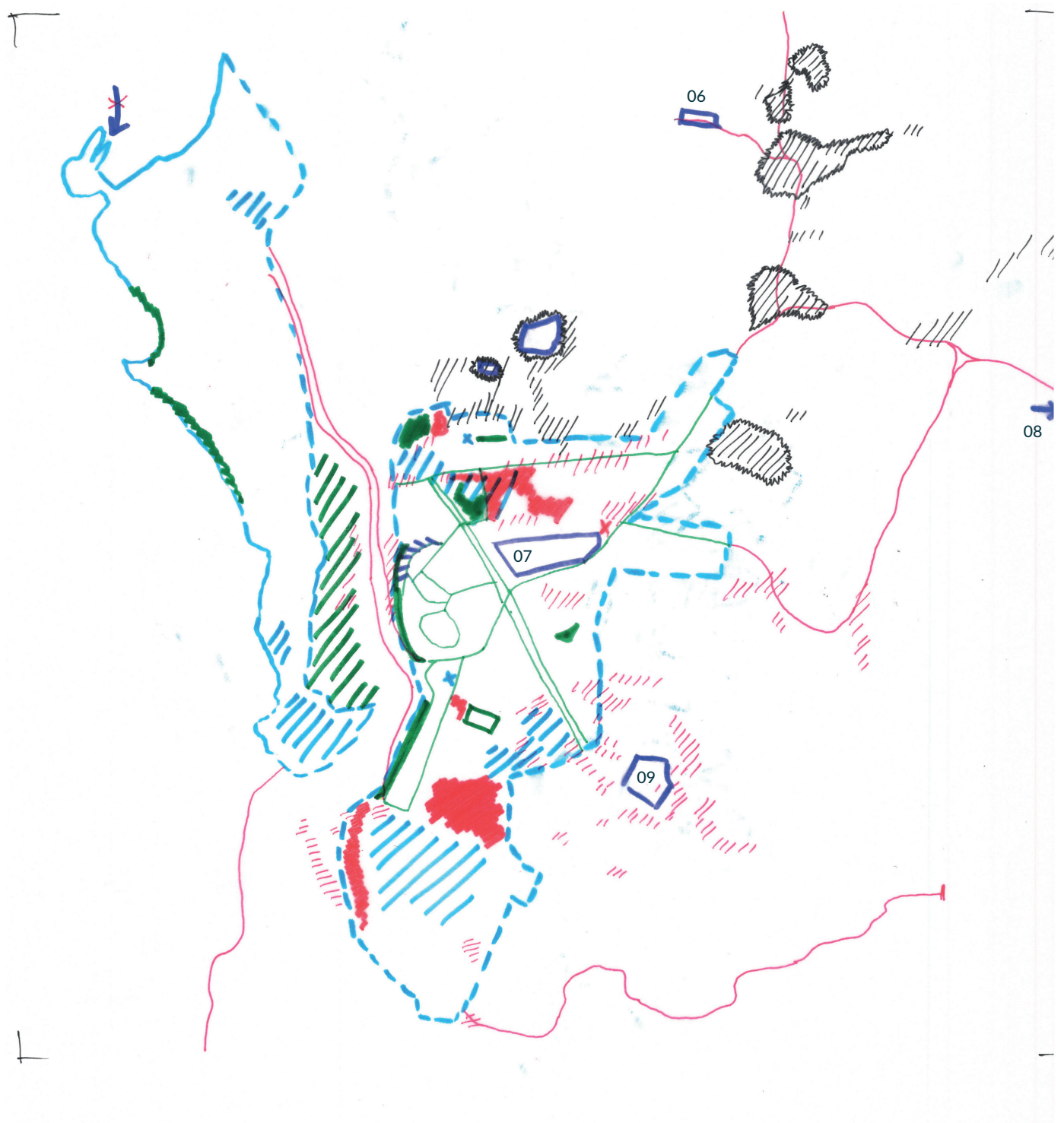
Design

Synthetic map of design interventions

Waste collection points at schools, markets and in public spaces are not highlighted on this scale, because this would clutter the map.

- 01 punto limpio (not visible)
-  04 waste collection informal settlements
-  05 clean up after market hours
- 06 sanitary landfill
- 07 sorting facility
- 08 textile recycling plant
- 09 integral waste facility
-  12 surveillance
-  13 landfill perimeter protection
-  15 erradicating micro dumps
-  16 reducing stray dog population
-  20 import restrictions for used textile
-  21 international quality agreement
- 25 recycling at school (not visible)
-  30 territorial office
-  40 from dump to park
-  41 defragment urbanity
-  42 formalize informal settlements
-  43 contain clandestine landfills
-  44 road side barriers
-  45 no to no-spaces
-  46 slow traffic infrastructure
-  47 quality public spaces
-  48 embellishment, greenery and shading

0 1 2 km N



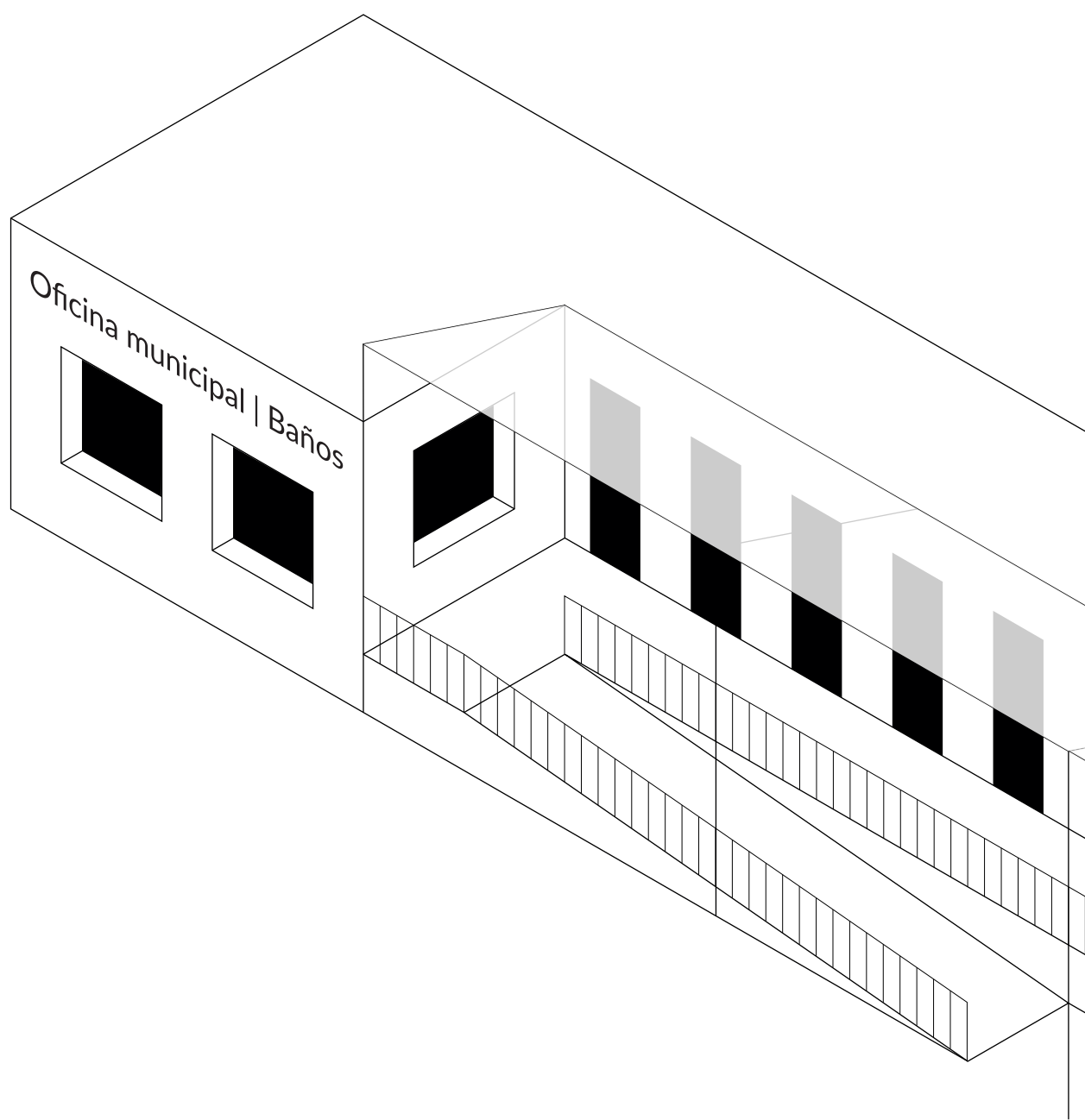
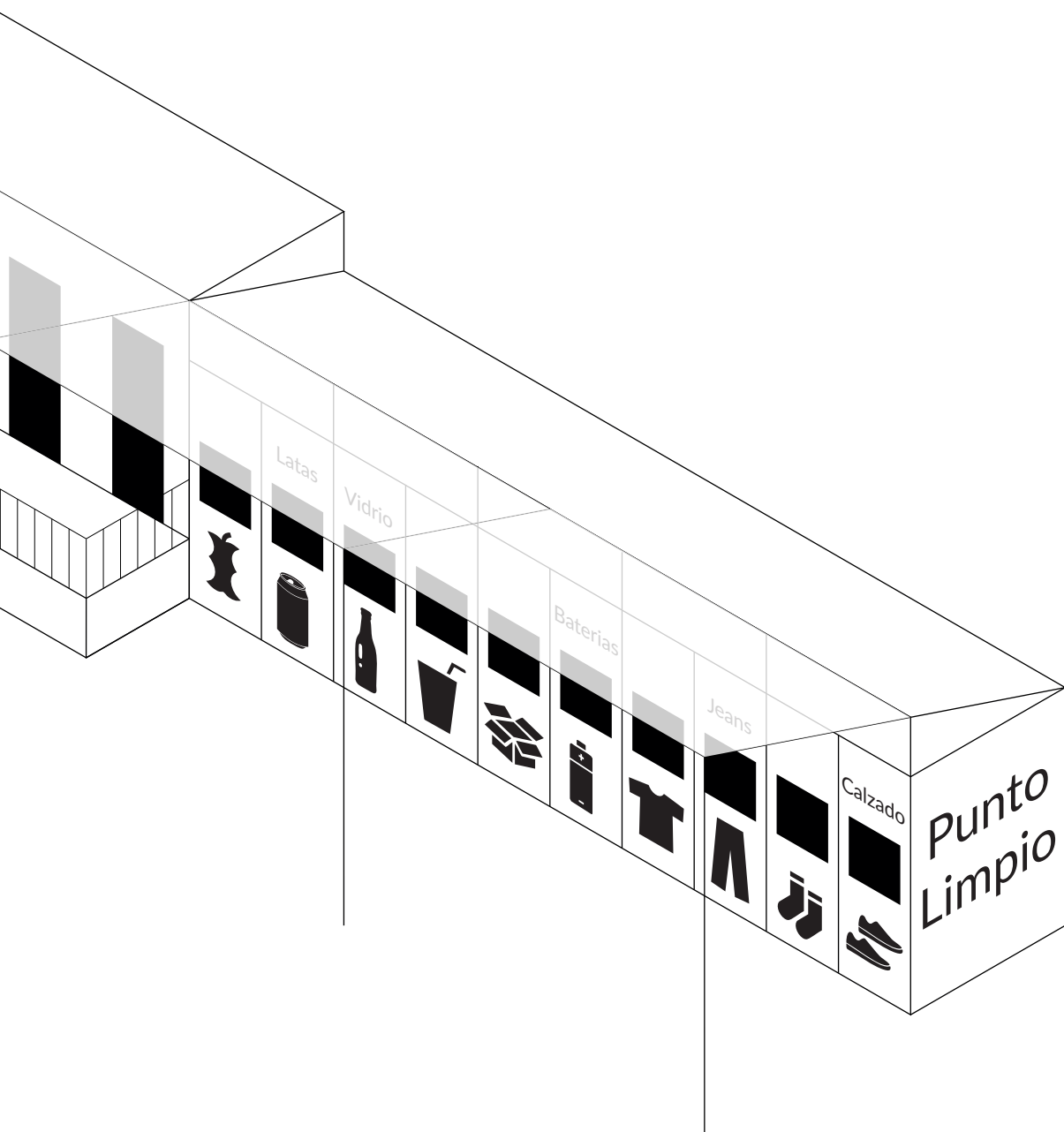


Image 8.2: Punto Limpio Quebradilla
Source: by author



PART C - CONCLUSION

9. CONCLUSION

Here I will answer the main question of this thesis, repeated below, by formulating concise and concrete answers to the research questions.

“How can spatial and non-spatial interventions regarding the issue of clandestine landfills demanded by activism-driven reshaping of urban-desert imaginaries restore environmental justice for human and more-than-human entities in Iquique and Alto Hospicio?”

[RQ1] What is the extent of the damages to environmental justice for human and more-than-human entities caused by clandestine landfills?

Collectively covering an area of over 600 hectares, micro dumps within and outside of the urban areas of Alto Hospicio and Iquique and clandestine landfills of textile and other waste materials. This severely undermines environmental justice – the fundamental right to live or exist in an environment free of contamination – for both human and more-than-human entities in the territory which has been converted into a sacrifice zone of global materialism. Damages include the impact on the integrity of the natural landscape through the presence ashes and waste, as well as the marks of vehicles and heavy machinery, that have gone off road to either discard waste materials or to clean them up, carved into surface like permanent scars, spoiling both the view over the otherwise enchanting desert landscape and the material pureness of the soil, which toxic particles seep into upon degradation. These wastescapes also harbor pests, from flies to stray dogs, posing health threats to the human and pet population especially within nearby neighborhoods, such as El Boro and many informal settlements, highlighting the intersectionality of environmental injustice with socio-economic vulnerability. Another health risk emerging from these unregulated spaces of waste disposal is air pollution, as piles of waste are frequently set ablaze to create space for more waste, causing black, white and grey fumes of smoke to rise up high above even the surrounding mountainous landscape, spreading toxic particles throughout the territory; into the city where people, especially younger children may suffer from respiratory diseases like asthma as a consequence; into the pacific ocean, affecting the health of sea life, including jellyfish, sea lions and whales.

[RQ2] How do urban-desert imaginaries from the past and present enable the proliferation of clandestine landfills? (Through which systems, infrastructures and networks?)

Firstly, the creation of the image of El Despoblado de Atacama representing the desert as a harsh, inhospitable and desolate territory, – in spite of an abundance of desert settlements in quebradas and ancestral cultural heritage providing testimony to its contrary – motivated an increase of national and international migration from the interior towards coastal cities, thus negatively impacting the livability in the interior in a self-fulfilling-prophecy-like fashion by causing a youth-drain. This flow of migration stimulated concentrated urbanization consolidating the image of urbanity in

coastal cities like Iquique, resulting in a disconnect and [fancy word for harsh duality] between the urban and the desert, reducing their relationship to little more than geographical proximity.

In addition, the paradigm of capitalism and economic growth along with its extractivist attitude reimagined the desert landscape a blank canvas awaiting human intervention and appropriation as a means to the end of money making. First it established a port of industrial scale and later when material extraction and export halted, reviving the ports bringing a free zone to town resulting in the superfluous import of products including cars and especially used textiles. The impact of its ventures on the surrounding environment is, much like disposal of left over stock not representing any economic value, of little to no importance to the money driven capitalist. In this way the systems, infrastructures and networks of the modern capitalist world including ports, free zones, roads, that have facilitated the emergence of ongebreideld and unregulated waste accumulation in a natural landscape within an unsustainable urban-desert imaginary wherein urban activity uitbuits the perceived passiveness of the desert for asymmetrical profit.

Finally, even the popular dreamy image of Iquique as coastal city pranked with its beaches and palmeras seems to have played a role in the disregard for the beauty of nature hidden within the apparent stillness of the desert landscape towards the interior of the region and the ignorance/negligence concerning the aanzwellende waste management crisis in the back yard of its younger sister and neighbor, the city of Alto Hospicio.

[RQ3] How is activism reshaping urban-desert imaginaries in Iquique and Alto Hospicio?

Through exposure, providing visual evidence of the local reality, activism has achieved global attention for the issue of waste accumulation in the desert landscape. Through workshops and educational campaigns, activism has fostered awareness and capabilities for sustainable behavior on a local scale. Through entrepreneurship, activism has generated pathways that provide an alternative destination to textile waste by developing circular products or rescuing and redesigning used clothing or redistributing them among a consumers all over the world. Through journalism, activism has vocalized a critique of the way the desert is being abused and through works of art is has provided stimulus for individual critical reflection, thus advocating for the reshaping urban-desert imaginaries towards a positive, respectful and appreciative relationship between the urban and the desert.

Moreover, activism has been the seed for critical public opinion, resulting in social pressure that has both moved stakeholders like ZOFRI S.A. to take action and contribute to the generation of a solution, and provided agency to the local government to lobby for more support and funds from higher up the governmental hierarchy to be able to deal with a problem on a scale that impressively supera the budget for waste management of a considerably poor municipality. Altogether, activism has been crucial in the battle against micro dumps and clandestine landfills, in ways beyond the reshaping urban-desert imaginaries.

[RQ4] What actions, projects and strategies are being carried out by different actors in an effort to terminate the proliferation of clandestine landfills and restore environmental justice?

In addition to activist NGOs, like Desierto Vestido and Reverdesierto, the municipality of Alto Hospicio is a key active stakeholder working on the through improvement of waste management, implementation of surveillance systems, collaboration with the private sector

and education in schools targeting children and at neighborhood gatherings targeting for adults. Other governmental institutions are financially supporting projects and startups with a sustainable mission as well as working on legislation to improve regulation of textile waste disposal in Chile and preventing disguised import of waste materials by defining trade quality requirements, an effort in which the Chilean government is supported by international relations.

[RQ5] How can spatial and non-spatial interventions to restore environmental justice regarding the issue of clandestine landfills be united into a coherent solution?

To achieve the restoration of environmental justice in the face of the issue of micro dumps and clandestine landfills in Iquique and mostly Alto Hospicio, there are innumerable, spatial and non-spatial interventions possible and necessary to be executed by stakeholders from all sectors of society, private, civil and public, ranging from a very local to a national and even international scale. From the point of view of the discipline of urbanism, however, can be narrowed down into five distinct categories: Waste Management, Regulation and Enforcement, Education and Engagement, Exposure and Protest, and Urban Planning and Design. Organizing the interventions from these categories into a pattern language offers a coherent interdisciplinary and multi-faceted solution to a complex multi-scalar issue, by defining pattern relations and connecting pattern to relevant stakeholders.

[RQ6] What does the application of the interventions with spatial implications look like in the context of Iquique and Alto Hospicio?

From a spatial point of view it looks like the following description.

Outside of the urban area:

- o Road side barriers restrict access onto the natural landscape, preventing the execution of unauthorized interventions including the dumping of waste, thus protecting the natural integrity of the desert landscape.
- o Smaller micro dumps will be eradicated and nearby access road will be monitored to prevent recurrence.
- o Larger clandestine landfills, that contain too much waste material to be feasibly absorbed into the existing sanitary landfill, will be equipped with spatial interventions that contain the contamination and inhibit the continuation of waste accumulation and burning on these sites.

Inside of the urban area:

- o Micro dumps will be eradicated, the new permanent cleanliness on the street positively influencing the perception people have of Alto Hospicio and thus stimulating a sense of care to keep the city clean. Which requires a civilian effort that will be facilitated by the network of collection points at parks, schools and markets.
- o Streets and public space are designed without any left-over undefined spaces that are susceptible to becoming a micro dump, preventing the emergence of new micro dumps.
- o Carefully designed public spaces at the edge of the urban area highlight the beauty of the desert landscape, stimulation appreciation of this geography in the perception of people living in the urban area, thus reestablishing a positive urban-desert imaginary in the territory of Iquique and even more so Alto Hospicio.

10. DISCUSSION

Having answered the research questions, I will now discuss how the interpretations developed throughout the project contribute to and differ from the existing academic discourse. The main concepts the discussion focuses on are imaginaries, activism, environmental justice, and the capacity of urban planning and design methods to contribute to counteracting the phenomenon of illegal waste accumulation.

With regard to imaginaries, this thesis builds on existing concepts of urban and desert imaginaries but proposes urban-desert imaginaries as a synthesis that foregrounds their interrelation in the context of extended urbanization. While scholars such as Lefebvre (1992) and Soja (in Lindner & Meissner, 2018) have conceptualized space and imaginaries as social products rooted in perceptions and representations, this research emphasizes how imaginaries are not only reflective but also generative of spatial outcomes.

In this case, the generative potential of urban-desert imaginaries is being operationalized by activist efforts that go beyond traditional modes of activism, such as resistance by demanding action from responsible public and private stakeholders directly through legal steps or indirectly through societal pressure. Additionally, activist efforts here include the production of alternative representations through creative projects like Atacama Fashion Week and El Gigante Vestido. These projects aim to change perceptions, thus catalyzing the reshaping of urban-desert imaginaries.

This thesis also set out to expand the academic discourse on environmental justice by incorporating more-than-human considerations, drawing on authors such as Donna Haraway (2016). While conventional approaches often center on redistributive mechanisms and human health equity, this research argues for an extended ethical framework that includes the rights of ecosystems and landscapes to remain free from both material contamination and symbolic degradation. In line with critiques of waste colonialism (Walsh et al., 2023), this perspective challenges dominant desert imaginaries of emptiness and sacrificial use. However, despite the intention to foreground more-than-human justice, this perspective remained at the margins of the thesis development. This was due in part to the human-centered nature of available data, including fieldwork findings, which highlights the difficulty of meaningfully integrating more-than-human stakeholders into spatial research and design practice. Further elaboration and methodological development would be needed to translate this expanded ethical lens into actionable planning tools.

Methodologically, this thesis departs from traditional planning frameworks by employing a pattern language, inspired by Alexander et al. (1977). It is used here as an interdisciplinary tool. It includes interventions and actions not typically from within the domain of urbanism, but also includes spatial interventions demonstrating the capacity of spatial design to inhibit environmental contamination, such as waste dumping, by access restriction or the careful design of public space, which positively contributes to the reshaping of urban-desert imaginaries and reduces susceptibility to unregulated waste accumulation by eliminating 'no-spaces', a term I coined to describe spaces within the urban area that are poorly defined in use and ownership.

11. REFLECTION

To reflect upon the project I will answer five questions that are provided in the graduation manual plus two that I have added myself.

What is the relation between your graduation project topic, your master track Urbanism, and your master programme (MSc AUBS)?

My graduation project topic, textile waste accumulation in the desert landscape of Alto Hospicio, Chile, is closely related to the Transitional Territories studio topic Altered Natures, as the mountains of discarded textile waste gravely impact the natural landscape. Furthermore, my graduation project is related to the Urbanism track within the MSc AUBS master programme through its focus on the exploration of the relation between the urban and the natural landscape and the way imaginaries, to be understood as perceptions and representations of desert-space influence the relation between urbanization and desert, fitting perfectly into the research-realm of extended urbanism, which is a concept that refers to the ways urban characteristics, systems, and influences stretch beyond traditional city boundaries into rural, peri-urban, and even remote or natural areas, challenging the conventional idea that urbanism is confined to dense, centralized cities.

How did your research influence your design/recommendations and how did the design/recommendations influence your research?

My research was deeply intertwined with the formulation of recommendations. Firstly, my initial research exploring the topic, informed the construction of the conceptual framework, which can be considered as a recommendation for the approach regarding the issue. The conceptual framework subsequently steered the focus of my theoretical research towards the concepts of environmental justice and urban-desert imaginaries, two core elements in my conceptual framework.

A third component, namely activism, I continued to research through investigating examples of efforts against the accumulation of textile waste in the desert landscape of Alto Hospicio. This research avenue led me to realize that not all of these efforts are necessarily a form of activism, but should rather be categorized into different domains, which made me decide to design a pattern language. In turn, did the inclusion of the design of a pattern language into my methodology lead me to revise my conceptual framework adding a fifth core element accommodating interventions beyond activism, thus adjusting my recommendation to adequately address the issue.

Moreover, the application of the pattern language guided further spatial research of the project area, making me look into the prevalence of qualities that determine the possible implementation of specific patterns on specific locations. This spatial research, then resulted in an overview of recommended interventions for Alto Hospicio and Iquique that will contribute to solving the problem of environmental injustice due to textile waste accumulation in the desert landscape.

How do you assess the value of your way of working (your approach, your used methods, used methodology)?

A crucial part of my way of working was to conduct immersive fieldwork, living in Alto Hospicio for a week and a half and in Iquique for a week and a half to experience the contrast between both places.

This helped me to generate a deeper understanding of local context and helped to ground the design recommendations in reality.

The pattern language as an observatory method I have found a useful tool to be respectful of the foreign context and build upon existing knowledge and experience instead of reinventing the wheel in an colonial fashion, imposing a solution not sensitive to local context.

Moreover, I consider the pattern language essential to make the connection between the spatial and non-spatial interventions required to compose the solution for this problem.

How do you assess the academic and societal value, scope and implication of your graduation project, including ethical aspects?

The main academic value of this project lies firstly in the positioning of the issue in relation to an existing theoretical body of knowledge, and more importantly, in the capturing of relevant case study, translated into a design – the pattern language – that can be reapplied.

The value for society lies in a potential improvement of environmental quality if the recommendations made in the design based on the pattern language will be executed. The ethical responsibility therein has been to consider conflicts of interests of stakeholders, which are included in patterns accompanied by a warning sign.

How do you assess the transferability of your project results?

As this project targets an issue that is a symptom of non-circular global supply-and-waste chain, there are many other places in the world that face the same problem, including many countries in Africa and South-East Asia. Even the intersectionality of the issue of textile waste with the issue of informality in labor and housing is presumably common in the territories that find themselves at the end of the global textile supply-and-waste chain. Thus, challenges that result from these issues and their intersectionality will be similar, indicating that this project can be relevantly transferred to other cases.

However, it is important to take into account that this project was developed in a specific geographical, socio-economic and cultural and legal context. Applying the outcomes of this project to another location with similar challenges, therefore requires reflecting critically upon the contextual differences between this case and the other. Differences in geography will influence how textile waste spreads throughout the territory and in which manner it causes environmental harm. For example, it is easy to imagine that the impact of dumping textile waste into a river will significantly differ from the situation at hand were waste is being accumulated in the desert. Socio-economic particularities are crucial to understanding whether proposed solutions might negatively affect livelihoods. Meanwhile, the cultural and legal context largely determine which stakeholders need to be involved and what their role should be in the process of solving the problem.

Through developing a pattern language, I have attempted to abstract solutions in order to increase transferability and with that also their academic value. However, the set of patterns developed here has emerged from analysis and design in this specific context, catering to challenges fundamentally connected to the issue of textile waste as well as to contextual particularities. Therefore, applying this pattern language in another context will likely result in the conclusion that some of the patterns that are relevant here, are not so relevant in another case or need to be altered. At the same time, new patterns relevant for that specific context will likely emerge.

How has your research influenced your understanding of the issue?

At first, I started my research asking myself how it is possible that no one is doing anything about this pollution contaminating such an enchantingly beautiful landscape. However, I am relieved to say that the implicit hypothesis that 'no-one is doing anything about it' which in part sparked my intrigue by the topic and thus my motivation for this thesis has been utterly dismissed by the findings of my research. Along the way I have found that generally people do care and initiatives, not only to generate awareness, but also to achieve change in the current dynamic that sustains the problem, are quite numerous. Likewise, I have been positively impressed by the amount of people contributing to this work on behalf of diverse stakeholders such as public institutions, private organizations and NGO's.

However, during fieldwork I also noticed that my initial misperception of 'no one is doing anything about it' is commonly shared among local people that are not in any way themselves involved in contributing to the problem solving. Maybe the issue of awareness is relevant not only for the problem itself but also for the solution.

Moreover, through my research, my take on the problem has shifted from considering it as an environmental issue to understanding it as a symptom with severe environmental implications resulting from a complex interplay between social problems, economic dependencies and inadequate legislation. Therefore, the project is not so much about interventions in the landscape, but rather about tackling underlying social and regulatory issues.

What are the key insights or lessons you derived from conducting your project in a foreign context?

At the beginning of this project I was hesitant in developing the project outline because I wanted the project to be sensitive of a local culture and socio-economic context that I did not yet know much about. This struggle led me to position the project and myself as a researcher in service of local activism. Later, I discovered that surrendering my agency as an urban designer is in fact counterproductive and would have prevented me from making a relevant contribution to cause. As a result, this project has taught me to perform a balancing act between exercising my own agency in the role of researcher / urban designer and maintaining a respectful and humble attitude by observing without imposing.

In addition, a particularly important issue with regard to working in a foreign context is language. Although Spanish is not my native tongue, I do consider myself fluent which has proven invaluable to the development of the project. It has helped me in reviewing policies; it has made relevant literature accessible to me; it has made getting around during fieldwork easier; it has diminished the barrier to my understanding of the local culture; and most importantly it has allowed me to conduct interviews and have conversations in Spanish, so that interviewees could express thoughts, concerns and ideas in their native tongue, assuring accuracy of information.

Furthermore, working in a foreign context comes with the advantage of decreased likeliness to take relevant details for granted. Meanwhile I noticed that the downside of that same coin is the risk of getting carried away delving into contextual details that are not directly relevant to the project out of insecurity to overlook something that would have been obvious to a local person.

12. LIMITATIONS

Like any project, the development of this work was shaped by certain limitations, which I outline below, categorized into scope limitations and executive limitations.

Scope limitations

The focus of this thesis has been on the situation at the end of the chain of the fashion industry. Therefore I did not address the fast fashion value chain as a whole through the lens of circularity. Were that the case, then the most crucial solutions would focus on interventions higher up the chain, tackling overproduction, overconsumption and premature disposal.

Executive limitations

During fieldwork, I was unfortunately unable to engage directly with local activists. Their perspectives could have offered more nuanced and critical insights into grassroots efforts surrounding the issue. In particular, they may have deepened the understanding of the development and spatial dynamics of illegal dumpsites, as they are closely involved with the on-the-ground reality through frequent field visits and community engagement. This limitation was partially mitigated by the availability of rich secondary sources—such as documentaries, interviews, social media content, and other publications—featuring activists and organizations like the NGO Desierto Vestido. These resources provided valuable indirect insight into their perceptions, actions, and framing of the issue.

Regarding the design outcome of this project, the pattern language, an important limitation lies in its emphasis on the human, overlooking the more-than-human, which originally was explicitly intended to be included into the project scope. Because the fieldwork was largely based on interviews and observations involving human actors and interventions within human-dominated environments, the resulting patterns are primarily oriented around human systems, behaviors, and institutions. As a result, the roles and agencies of more-than-human entities are underrepresented.

It is also important to note that the pattern language developed here is not intended to be exhaustive. It emerged from the specific context of Iquique–Alto Hospicio and is shaped by the particular conditions, actors, and dynamics present there. Applying this framework in other contexts would likely necessitate both the addition of new patterns and the omission of some that are too context-specific. Furthermore, a balance was sought between compactness and specificity: to keep the language concise and accessible, some patterns integrate multiple elements that could, in future work, be disaggregated into more detailed sub-patterns. This opens possibilities for future research or design projects that aim to delve deeper into specific dimensions of the issue.

13. FURTHER RESEARCH

My first suggestion for further research regards the meaningful integration of rights for nature in preventive strategies to protect the integrity of the environment and the natural landscape. By this I particularly mean all nature opposed to rights only for established protected areas. The question would thus be something like: "How to defend the integrity of the natural landscape beyond protected natural areas?" This is relevant to the case study of Alto Hospicio and the wider region given the fact that there is a lot of pressure – in the shape of waste disposal as well as other extractive practices such as mining – on the vast natural landscape, which is not an established protected natural area, and likely to large and heterogenous to be eligible for the status.

From a curative perspective an interesting question for further research regarding the integrity of the natural landscape is how to recover sites affected by clandestine landfills and micro dumps. This question rises from the observation of scars that are left in the landscape even after a dump site has been eradicated, meaning the waste has been removed.

Another topic, that I have touched upon only lightly in this thesis is the issue of waste management in informal settlements. After all, the occurrence of informal waste disposal can only be assured if there is a well function formal alternative. This is particularly interesting for the case study of Alto Hospicio given the high prevalence of informal settlements.

Furthermore, this research has defined a further design task, which is the design of streets and public spaces in way that eliminates undefined spaces with the urban area to reduce the susceptibility of urban space to unauthorized interventions such as dumping waste.

14. ETHICAL PARAGRAPH

In the status quo, it appears that some economically vulnerable individuals depend on the proliferation of clandestine landfills for a livelihood. In order to propose a proper solution for the issue of clandestine landfills in Alto Hospicio, the socio-economic realities of these individuals have to be taken into account.

The aim of the thesis has been to take more-than-human entities into account as stakeholders. They are, however, voiceless and not able to speak for themselves. Thus humans, such as environmental activists and scholars, will be speaking for nature / more-than-human, at the consequence of representing their interests through a human lens.

During fieldwork I have conducted interviews with professionals involved in efforts against the proliferation of the clandestine landfills. In order to not expose them to any risk, I have set up a data management plan and asked interviewees to read carefully and sign an informed consent form.

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APPENDICES

El Boro

Walking the hills - photo report











