

Pattern deck

UNDRESSING THE DESERT

**A Pattern Language to restore
Environmental Justice damaged
by Textile Waste Accumulation
in the Desert**

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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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MSc Thesis Proposal

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Introduction

Welcome to: *A Pattern Language to Restore Environmental Justice Damaged by Textile Waste Accumulation in the Desert.*

This pattern language was developed as part of the master graduation thesis “*Undressing the Desert*”, focusing on the case of Alto Hospicio–Iquique, Chile. The patterns are based on fieldwork, expert interviews, policy reviews, and secondary sources.

The concept of a pattern language was introduced by architect Christopher Alexander in 1977. It consists of a collection of patterns, each addressing a specific problem or aspect of a complex issue. When structured coherently, these patterns can work together to support the emergence of an integrated design. To enable this, the patterns are organized and their interrelations are made explicit.

Each pattern is presented as a double-sided A6 card. A template card is included to explain how the information is structured. The color of the cards indicates the domain to which each pattern belongs. The domains are:

Waste Management

Regulation and Enforcement

Education and Engagement

Exposure and Protest

Urban Planning and Design

I M A G E

TITLE

Nr.

Hypothesis (relating why and how)

Textile waste

<- slider ->

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

Why

Practical Implementation

How



Attention

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

Stakeholders

... | ... | ...

Related Patterns



Sources: Fieldwork | Interview | Literature

Glossary

1TA	Primer Tribunal Ambiental (Environmental Court in the Northern Macro region of Chile)
AM IQQ-AHO	Area Metropolitana Iquique-Alto Hospicio (Metropolitan Area Iquique-Alto Hospicio, under administration of the GORE Tarapacá)
Bienes Nacionales	Ministerio de Bienes Nacionales (Ministry responsible for managing and regulating publicly owned lands and national assets throughout the country.)
CChC	Cámara Chilena de la Construcción (A private, non-profit trade association that represents companies and professionals in Chile's construction industry.)
CircularTec	Centro Tecnológico de Economía (Circular Technological Center for Circular Economy, dedicated to accelerating the transition to a circular economy through collaborative research, innovation, and industry-academia-government partnerships.)
CONAF	Corporación Nacional Forestal (Public service agency that manages and protects Chile's forests, national parks, and wildlife.)
CORFO	La Corporación de Fomento de la Producción (Public service agency that promotes Chile's economic development by supporting innovation, entrepreneurship, and productive investment.)
GORE Tarapacá	Gobierno regional de Tarapacá (Regional Government of Tarapacá)
GRANSIC	Gran Sistema Colectivo de Gestión (Part of Chile's Extended Producer Responsibility (Ley REP) framework, introduced to

	help companies collectively organize the collection, recycling, and financing of waste materials corresponding to defined priority products.)
Ley REP	Ley Responsabilidad Extendida al Productor (Extended Producer Responsibility Law)
MAHO	Municipalidad de Alto Hospicio (Municipality of Alto Hospicio)
Mineduc	Ministerio de Educación (Ministry of Education)
MINVU	Ministerio de Vivienda y Urbanismo (Ministry of Housing and Urban Development)
MIQQ	Municipalidad de Iquique (Municipality of Iquique)
MMA	Ministerio de Medio Ambiente (Ministry of Environment)
MOP	Ministerio de Obras Publicas (Ministry of Public Works)
Seremi	Secretaría regional ministerial (Regional ministerial secretariat)
SERVIU	Servicios de Vivienda y Urbanización (A regional agency under the Ministry of Housing and Urbanism)
SMA	Superintendencia del Medio Ambiente (Chile's decentralized public agency under the Ministry of the Environment, tasked with monitoring, enforcing, and sanctioning compliance with environmental regulations.)
ZOFRI S.A.	Zona Franca de Iquique Sociedad Anónima (The company that manages and operates the free trade zone in Iquique.)



MOBILE WASTE COLLECTION POINTS

2

Mobile waste collection points can be placed at event locations to collect waste generated during the event sorted by its material nature, making the waste stream suitable for recycling.

Textile waste

Other waste

Infrastructure

Site

Theoretical or Emperical Back-up

Events typically produce a high concentration of waste in a short time and in a specific location. Placing mobile waste collection points at these sites encourages visitors to help to dispose of this waste responsibly. Since event waste often consists of large volumes of similar materials, such as drinking cups, collecting them separately significantly increases the potential for effective recycling.

Practical Implementation

Waste management company Recynor has developed the Eco Truck, a mobile waste collection unit that brings recycling directly to communities. During religious festivals in La Tirana and San Lorenzo in Chile's Tarapacá region, these mobile units were successfully deployed through a public-private partnership. The initiative was later expanded to the Carnival in Arica, a coastal city 200 kilometers north of Iquique. During Carnival 2025, one of South America's largest, over six tons of waste were carefully sorted, separated, and compacted.

Stakeholders

Waste management companies (Recynor) | Event hosts | Municipalities | Sponsors (ZOFRI S.A.) | Event visitors

Related Patterns

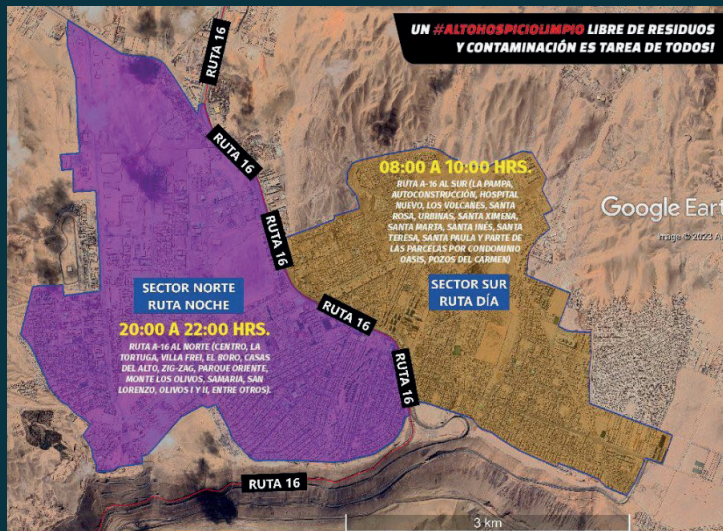
1

24

31

32

Sources: (Recynor, 2023) | (ZOFRI S.A., 2025)



SCHEDULED HOUSEHOLD WASTE COLLECTION

3

Organizing household waste collection according to a clear and constant schedule helps residents to know when to take out the trash to reduce the time the trash stays outside vulnerable to pillaging by stray dogs.

Textile waste

Other waste

Policy

City

Theoretical Back-up

When residents take out the trash for household waste collection, there is a risk that stray dogs will tear open the bags to search for food. The longer the bags remain on the street, the greater the chance of this happening. To minimize this risk, it is important to coordinate a clear waste collection schedule, allowing residents to take out their trash shortly before the collection truck arrives. This helps reduce the amount of waste on the streets, whether in bags or scattered by animals, and contributes to a cleaner environment.

Practical Implementation

Effective communication is a key element of scheduled waste collection. The municipality can use social media to announce both permanent and temporary changes to the collection schedule, such as adjustments due to public holidays.



Attention

In Alto Hospicio, household waste collection occurs very frequently, yet problems persist because many residents ignore the schedule and often put out their garbage just after the collection truck has passed.

Stakeholders

Municipalities | Recicladores de base | Residents

Related Patterns

12

26

27

Sources: Fieldwork | Interview official MAHO



WASTE COLLECTION IN INFORMAL SETTLEMENTS

4

Organizing a separate waste collection service in informal settlements, where regular door-to-door waste collection legally can not be provided, prevents the accumulation of waste in and around them.

Textile waste

Other waste

Policy

Neighborhood

Theoretical or Emperical Back-up

According to the TECHO report 2022-2023 there are 63 informal settlements in Tarapacá. Most of them, 46, are located in Alto Hospicio and another 11 in Iquique. Only 26 of the informal settlements in Tarapacá have a dedicated space for waste disposal.

In the absence of formal waste management there are many micro dumps in and around informal settlements. Shown on the picture is the example of a micro dump at Mirador Paso de la Mula next to Alto Hospicio's largest informal settlements Toma Paso de la Mula.

Practical Implementation

The municipality of Alto Hospicio deploys a special service to collect waste from informal settlements.



Attention

Formally providing a service such as waste collection in an informal settlement is legally complicated.

Stakeholders

Municipalities (MAHO) | AM IQQ-AHO | Community leaders in informal settlements

Related Patterns



Sources: Fieldwork | Interview official MAHO | (Moncada Díaz, 2023)



CLEAN-UP AFTER MARKET HOURS

5

Deploying a clean-up team after operational hours of an open market safeguards the maintenance of cleanliness on site.

Textile waste

Other waste

Policy

Site

Theoretical or Empirical Back-up

La Quebradilla is the biggest open air market of the metropolitan area. The activities on the market generate waste, from packaging material to unsold products.

Practical Implementation

To maintain hygiene and order on this site the department of cleanliness and ornament of the MAHO employs a clean-up team to go there every day after the market is being dismantled at around 16:00h. The team is equipped with broomsticks, garbage containers and shovel loaders to collect the waste left behind by visitors and vendors.



Attention

Although the area of the open air market itself is being cleaned on a daily basis, directly besides it, there are micro dumps. I even witnessed a small burning at the margin of the market area during a clean-up. Moreover, the guarantee of an after hours clean-up undermines the concept of responsibility of the producer of the waste material.

Stakeholders

Municipalities (MAHO) | Fair vendors | Workforce (clean-up crew)

Related Patterns



Sources: Fieldwork | Interview official MAHO



SANITARY LANDFILL

6

Waste streams that are not suitable for recycling need a place to go, which can at best be a sanitary landfill, which is designed, built and operated under legal restrictions and provision that aim to minimize sanitary and environmental problems.

Textile waste

Other waste

Infrastructure

Region

Theoretical or Emperical Back-up

Chilean government distinguishes sites of waste disposal as '*basurales*', dumps, which are spontaneous without sanitary or environmental control; '*vertederos*', landfills, which are planned, but lack sanitary measures to prevent sanitary and environmental problems; and '*reellenos sanitarios*', sanitary landfills, which are designed, built, and operated in compliance with the provisions of Supreme Decree No. 189 to reduce sanitary and environmental problems.

Practical Implementation

The opening of sanitary landfill Santa Inés has allowed the closure of landfill El Boro. It is a private facility operated by Cosemar, with a surface area of 46.2 hectares. Located in the 'Las Quemadas' sector of Alto Hospicio it has been active since 2020. During its 20 operational years, it can receive approximately 4,767,245 tons of solid waste. It serves the municipalities of Iquique and Alto Hospicio for the disposal of solid household and similar waste, as well as private clients.



Attention

By law, sanitary landfills are not allowed to take in textile waste, because this causes soil instability.

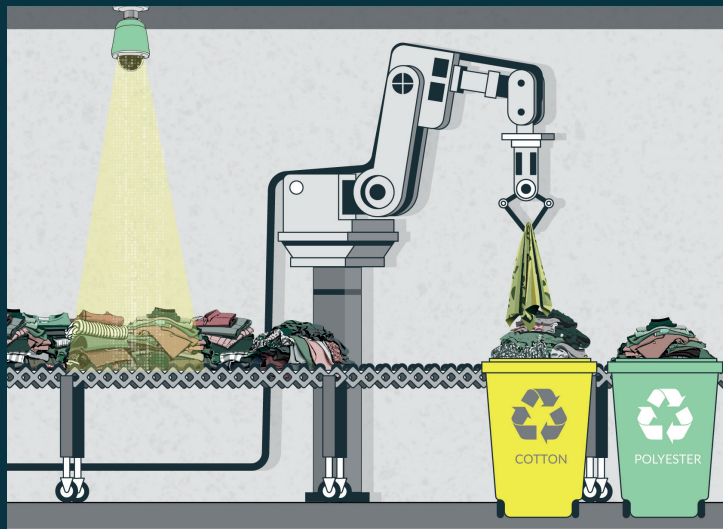
Stakeholders

Waste management company (Cosemar) | Municipalities

Related Patterns



Sources: Interview official MAHO | (Vivanco Font, 2022) | (MINVU, 2019)



WASTE SORTING FACILITY

7

By sorting collected unsorted waste based on its material nature a waste sorting facility generates waste streams that are suitable for recycling, while reducing the amount of waste that will be deposited into a sanitary landfill.

Textile waste

Other waste

Theoretical or Empirical Back-up

Currently all waste materials that are being collected for recycling are being transported to Santiago for processing. Leader in recycling in Latin America, Ambipar Environment, having taken over the regional recycling company RECYNOR, has announced the construction of an Integral Industrial Waste Management Plant (GIRI, after its Spanish acronym for 'Planta de Gestión Integral de Residuos Industriales') in Tarapacá.

Practical Implementation

Requiring an investment of over 3 million USD, GIRI Norte will be developed with the same standards as the Sorting and Pretreatment Center for Waste Valorization that the company is building in Santiago. It will have the capacity to process 10,000 tons of non-hazardous solid waste for valorization, such as plastics, metals, wood, paper, cardboard, etc. annually and will convert these material into streams of high quality raw materials to be used in production of new products.



Attention

The project was announced in 2023 and to be realized in 2024. However, it has not yet been built.

Stakeholders

Waste management companies (Recynor) | AM IQQ-AHO

Related Patterns

6

8

9

10

11



TEXTILE RECYCLING FACILITY

8

The establishment of a textile waste recycling facility provides an environmentally sound alternative destination for textile waste to not end up in clandestine landfills.

Textile waste

Other waste

Theoretical or Empirical Back-up

There is currently no legal way to dispose of textile waste in Tarapacá as the material is not permitted in legal landfills because it generates soil instability. However, at kilometer 20 of route 16 a textile recycling facility is under construction.

Practical Implementation

The project named Recitex, for which funding was received from CORFO, is a private initiative by two Turkish brothers with over 14 years of experience trading in used textiles in Iquique under their holding of Bayram enterprises. The plant is expected to be operational as of May or June 2025, will process 20 tons of textile per 8 hours and will employ a 25 people workforce. The product of the process, which does not involve the use of water, is a spun microfiber that will be used as filling for mattresses.



Attention

The interviewed recycling agent fears that a large community of people making a living from used textiles will be left behind, if the recycling facility processes too much of the imported material, including quality items fit for resale.

Stakeholders

Entrepreneurs in textile recycling (Recitex) | Sponsors (CORFO) | Municipalities (MAHO)

Related Patterns

7

10

11

18

20

23

21

Sources: Fieldwork | Interviews | (Ortega Novoa, 2025)



INTEGRAL WASTE TREATMENT CENTRE

9

An integral solid waste treatment centre (CTIR, after it's Spanish acronym for *Centro de Tratamiento Integral de Residuos*) brings together several waste management infrastructures in one large precinct to increase process efficiency and reduce transport costs.

Textile waste

Other waste

Infrastructure

City

Theoretical or Emperical Back-up

The project consists of a sanitary, environmentally and technically sustainable facility for the final disposal of household and similar solid waste, which includes the recovery of organic waste to produce compost, treatment of recyclable inorganic waste, management of bulky waste and final disposal of construction waste from the municipalities of Alto Hospicio and Iquique, through a transfer station.

Practical Implementation

The project's intervention area is approximately 148 hectares within a 300-hectare municipal property located in the Pampa Perdiz sector. The useful life of the project is estimated at 40 years and 8 months: 8 months construction stage, 20 years operation stage and 20 years closure stage.



Attention

An environmental permit, or RCA, after its Spanish acronym for *Resolución de Calificación Ambiental*, was issued for this facility in 2019 with a validity of five years. In 2024, the project was still in the design phase due to organizational challenges. The facility has not yet been built.

Stakeholders

GORE Tarapacá | AM IQQ-AHO | Waste management companies

4

6

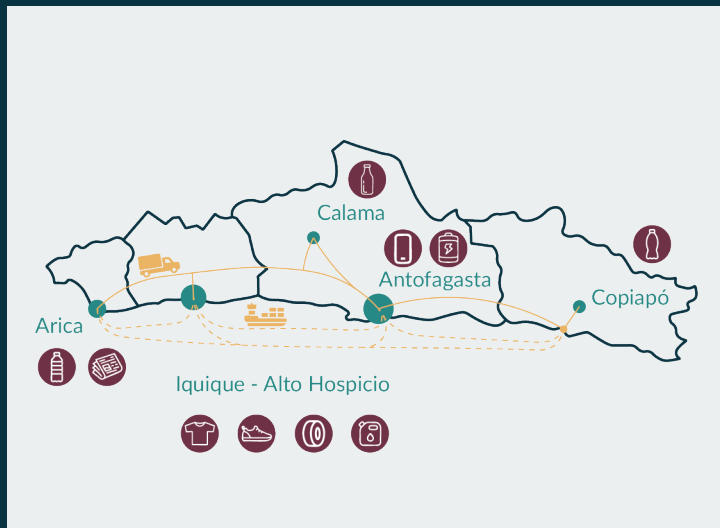
7

10

13

Related Patterns

Sources: (Departamento Gestión de Inversiones Regionales de División de Desarrollo Regional de SUBDERE, 2024) | (El Longino, 2021) | (MINVU, 2019)



RECYCLING NETWORK ZONA NORTE

10

Having a least one recycling facility per waste material within a recycling network in the macroregion of Northern Chile eliminates the need to transport waste materials over long distances (e.g. to Santiago) in order to be recycled.

Textile waste

Other waste

Policy

Macroregion

Theoretical Back-up

Currently, all waste materials being collected separately for the purpose of recycling are transported to Santiago after compacting. Long-distance transport of recyclable materials increases emissions, costs, and logistical complexity, reducing the overall sustainability of recycling efforts. Collaboration between cities and regions in the northern macroregion of Chile can establish a recycling network with at least one recycling facility per waste material, preventing the need to transport waste materials over long distances (e.g. to Santiago) in order to be recycled.

Practical Implementation

To implement such a network in Northern Chile, cities and regions can collaborate to map existing waste management infrastructure and distribution of waste generation by waste material type. This serves to identify gaps and determine which location is best suited for the recycling of specific materials. Within the region of Tarapacá a start has been made to map recycling potential through a project titled “Escáner de Circularidad de Tarapacá” by Circular Tec.

Stakeholders

GORE Arica y Pinacota, Tarapacá, Antofagasta and Atacama | Municipalities | Sponsors (CORFO, CircularTec) | Waste management companies

Related Patterns



Sources: (CircularTec, n.d.) | Interview with representative from CORFO



PRODUCTS FROM RECYCLED TEXTILE

11

The development of innovative products made from recycled textile redefines the perception of textile waste from waste to resource.

Textile waste

Other waste

Enterprise | Product

Country

Theoretical or Emperical Back-up

Textile waste can be used as a resource to produce new products. Examples include thermal insulation panels by Procitex, and yarn by Ecocitex.

Practical Implementation

In 2015, Procitex CEO Franklin Zepeda started the development of his prototype thermal insulation panels from recycled textile and, after having the product certified for fire resistance, opened the first production facility in Alto Hospicio in 2016 taking textile from dumpsites and from ZOFRI to prevent it from being dumped. In 2022, production was moved to Santiago. Procitex charges companies for receiving textile waste and makes use of tracing codes, ensuring that no textile gets lost along the way. The production process entails six steps: 1) receiving the textile, 2) selecting, 3) peparing the textile by taking of buttons etc., 4) shredding, 5) mixing in flame retardent additives, and 6) compacting into panels. The panels can be recycled again.



Attention - Due to commercial challenges, the original facility in Alto Hospicio is no longer active.

Stakeholders

Entrepreneurs in textile recycling (Procitex, Ecocitex) | Sponsors (CORFO)

Related Patterns



Sources: (Tarapaca Smart, 2023) | (Ecocitex, n.d.)



SURVEILLANCE AND FINES

12

Through (camara) surveillance and fining individuals conducting prohibited activities, regulations regarding waste disposal and environmental protection can be reinforced, reducing incidents and waste accumulation in the desert.

Textile waste

Other waste

Policy

City

Theoretical or Emperical Back-up

The use of surveillance and fines can serve as a deterrent against illegal waste disposal, reinforcing environmental regulations and encouraging responsible behavior. In the case of waste management, visible enforcement through cameras and fines can discourage illegal dumping and non-compliance with collection schedules.

Practical Implementation

The municipaly of Alto Hospicio writes fines for between 50 and 300 dolars. They have written fines for dumping waste in clandestine landfills as well as for taking out the trash outside of the scheduled timeframe for door to door waste collection.



Attention

Initially, many fines were later withdrawn by the court, because the footage provided as evidence was not conclusive enough. Moreover, surveillance in key areas is likely to be the cause of a further dispersion of clandestine landfills throughout the territory.

Stakeholders

Municipalities (MAHO)

Related Patterns



Sources: Interview official MAHO



LANDFILL PERIMETER PROTECTION

13

Official landfills of any kind need a perimeter protection to prevent illegal activities on the site.

Textile waste

Other waste

Spatial Intervention

Site

Theoretical or Empirical Back-up

The Escombros landfill directly west of former Municipal landfill El Boro does not have a perimeter protection. Legally it is not required to have one as the waste allowed on this location is limited to construction debris, which is officially considered non-hazardous. However, the lack of perimeter protection undermines the control of entry of materials, individuals and their activities. Consequently, illegal activities do take place as has been observed on the premises of the Escombros landfill during a site visit executed by the Superintendencia del Medio Ambiente in 2022.

Practical Implementation

A fence, for example similar to the one deliniating the adjacent El Boro landfill, would protect the perimeter of the Escombros landfill and keep out individuals with intentions of conducting illegal activities.

Regulation policies exempting (former) landfills for non-hazardous waste materials from the requirement of perimeter protection need to be addapted demanding the installment of such protection for all former, existing and future landfills.

Stakeholders

Municipalities | Waste management companies (Cosemar) | MMA



Related Patterns

Sources: Fieldwork observations | (Pastore Herrera & Ramos Riquelme, 2022)



MAPPING CLANDESTINE LANDFILLS & MICRO DUMPS

14

The development of a strategy to recover affected areas require a spatial overview, which can be generated through mapping clandestine landfills and micro dumps.

Textile waste

Other waste

Policy

Theoretical or Empirical Back-up

The municipality of Alto Hospicio 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 study the municipality developed a strategy.

The municipality of Iquique states on their website to be using geographic information system (GIS) software to identify potential micro dumps, with the purpose of eradicating them and installing containers for waste disposal.

A map of micro dumps was also included in the diagnostic study for the urban livability project by Corporación Ciudades.

Practical Implementation

Mapping can be done through both fieldwork and the use of GIS software.

Stakeholders

Municipalities (MAHO, MIQQ) | Urban (and landscape) planners and designers (Corporación Ciudades)

Related Patterns

15

30

43

44

Sources: Interview official MAHO | (Corporación Ciudades, n.d.-b) | (Municipalidad de Iquique, n.d.)



ERRADICATING MICRODUMPS

By eradicating microdumps environmental contamination is eliminated locally.

15

Textile waste

Other waste

Spatial Intervention

Site

Theoretical Back-up

Once identified, microdumps can be eradicated by the municipality to stop environmental contamination.

Practical Implementation

Microdumps are removed by deploying heavy machinery to clear the waste and transport it to a sanitary landfill. While effective in removing waste, these cleanup operations leave deep tracks and disturbed soil, creating visible scars on the landscape. The impact of such interventions is noticeable on Cerro Dragón, where former microdumps have been cleared but the land remains visibly damaged.



Attention

Eradicating larger clandestine landfills appears an unfeasible challenge, because 1) there is no budget, 2) there is nowhere the enormous volumes of waste can go, as taking them to the sanitary landfill would collapse the facility reducing its calculated useful life from 20 to about 4 years, 3) moving such large volumes of waste materials produces a lot of emissions, counteracting the objective of reducing environmental pollution.

Stakeholders

Municipalities (MAHO, MIQQ) | GORE Tarapacá | AM IQQ-AHO

Related Patterns

14

16

17

29

38

43

30

40

Sources: Interview official MAHO | (Municipalidad de Iquique, n.d.)



REDUCING STRAY DOG POPULATION

16

To prevent stray dogs from scavenging through micro dumps worsening the on site situation and spreading sanitary risks, the population of stray dogs roaming the streets needs to be reduced.

Textile waste

Other waste

Theoretical or Empirical Back-up

Alto Hospicio is widely known as a place where people go to abandon pets. As a result the great population of stray dogs. These dogs often scavenge through micro dumps and in doing so make more mess and spread sanitary risks, such as diseases.

Practical Implementation

There are plans to construct a center for the sterilization and care of pets. The center aims to provide tools and programs that promote responsible and regulated pet care, helping to prevent abandonment and uncontrolled reproduction.

Moreover, pet care pop-ups are organized in both Alto Hospicio and Iquique, where pet owners can have their pets vaccinated and sterilized free of charge.

Additionally, a pet shelter could absorb the population of stray dogs currently roaming the streets of Alto Hospicio.

Stakeholders

Municipalities (MAHO, MIQQ) | Dog owners

Related Patterns



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



COLLABORATION ACROSS GOVERNMENTAL SCALES

17

Collaboration with governmental organisations on a larger scale can provide municipalities with increased capacities and resources to address complex problems they are not equipped to deal with, such as extensive environmental pollution.

Textile waste

Other waste

Policy

City | Region | Country

Theoretical Back-up

On a national scale it comes down to the government recognizing the problem, shooting money and then turning their back on the execution of the solutions. On a regional scale a more elaborate effort for collaboration is ongoing through the establishment of Alto Hospicio - Iquique as a Metropolitan Area.

Practical Implementation

In 2023 the region of Tarapacá had Alto Hospicio - Iquique declared a Metropolitan Area under Law No. 21.074, “Strengthening the Regionalization of the Country”, published in February 2018. By this declaration a set of legal capacities was installed in the regional government of Tarapacá which is the legal administrator of the metropolitan area. Although waste management was not the primary motive, the increased legal capacities for the regional government do explicitly include the power “to approve the Prevention or Decontamination Plans involving a metropolitan area” as well as the power to “manage the collection, transport and/ or final disposal of solid household waste from one or more municipalities in the metropolitan area.”

Stakeholders

Gobierno de Chile | GORE Tarapacá | Municipalities (MAHO, MIQQ)



Related Patterns

Sources: (Comité Interministerial de Descentralización, 2023) | (Ministerio del Interior y Seguridad Pública, 2023)



EXTENDED PRODUCER RESPONSIBILITY

18

Incorporating textile as a priority product into the Chilean legislation for Extended Producer Responsibility, ley REP.

Textile waste

Other waste



Policy

Country

Theoretical or Empirical Back-up

In 2016, the ley REP (Responsabilidad Extendida al Productor, or extended responsibility for the producer) was introduced in Chile. Its aim is to reduce the production of waste and stimulate its reuse, recycling and valorization, thus striving towards a circular economy.

Practical Implementation

The law is designed as an economic instrument for waste management, which obliges producers of certain priority products to organize and finance the management of waste derived from the products they place on the market. Priority products currently include: tires, containers and packaging, lubricating oils, electrical and electronic equipment, batteries and accumulators. The inclusion of textile as a priority project was suggested early on by a representative from the region of Tarapacá, but the relevance was not recognized nationally at that time. However now, advances to include textile as a priority product have been made since 2021 and the ambition of the MMA is to implement it 2025.

Stakeholders

MMA | SMA | Producers of textile | Consumers | Municipalities

Related Patterns



Sources: (Ministerio del Medio Ambiente, n.d.) | (Órdenes, 2024)



TRACEABILITY

19

A legal framework for traceability of used textile from import all the way down the line to either purchase by a consumer or disposal by a certified recycling agent, facilitates the issuance of penalties for offenders and discourages illegal disposal.

Textile waste

Other waste

Policy

Country

Theoretical or Empirical Back-up

The principle of traceability seeks to generate information throughout the waste management chain to ensure that the final destination of the waste is adequate, to improve control during the waste management process, and to promote waste information. According to local experts on the textile waste crisis in Tarapacá, it would be wise to additionally monitor the supply chain of used textile starting from the point of import. Tracking volumes of used textiles until either resale to consumers or the handover to qualified recycling agents, prevents unregulated spillage.

Practical Implementation

Traceability is defined as a key principle in the ley REP (Law No. 20,920 in Article N°2 letter k). The law stipulates the principle as the “set of pre-established and self-sufficient procedures that allow to know the quantities, location and trajectory of a waste or batch of waste along the waste management chain”.

Stakeholders

MMA | Importers of used textiles | Recycladores de base

Related Patterns

10

17

18

22

Sources: Interview with recycling professional Punto Limpio ZOFRI | (Ministerio del Medio Ambiente, 2020)



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.

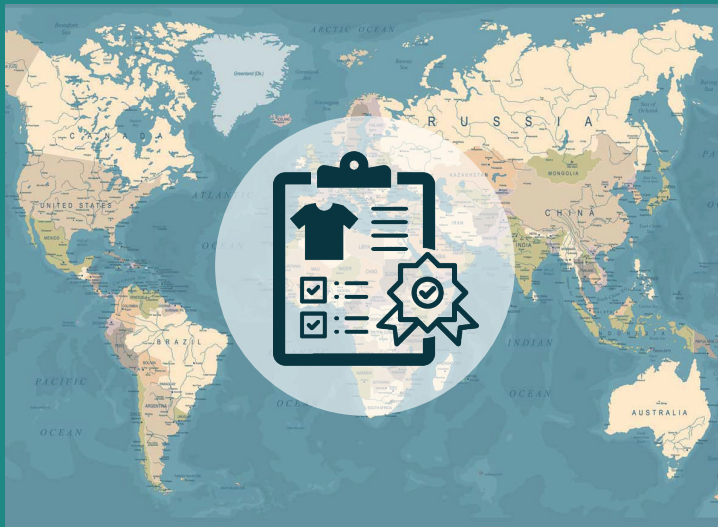
Stakeholders

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

Related Patterns



Sources: (Ministerio de Medio Ambiente, 2025)



INTERNATIONAL QUALITY STANDARDS USED TEXTILE

21

An international agreement between developed and developing countries on quality standards for used textile versus textile waste can safeguard a minimum quality of exported textile, putting an end to waste colonialism.

Textile waste

Other waste



Policy

World

Theoretical or Empirical Back-up

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.

Practical Implementation

In 2024 the United Nations issued a report on Global, European and Chilean perspectives regarding the used clothing crisis which concretely recommends to “develop minimum international criteria for second-hand clothing export” and “agree between both parties on legal definitions of ‘textile waste’ and ‘second-hand clothing’”

Stakeholders

Gobierno de Chile | UN | EU | foreign national governments of countries exporting and importing used textiles

Related Patterns

8

17

20

22

23

Sources: (UNECE & ECLAC, 2024) | (Walsh et al., 2023)



CLEAN PRODUCTION AGREEMENT

22

Anticipating stricter legal regulation regarding extended producer responsibility for textile producers a voluntary clean production agreement established between public and private parties can help to prepare stakeholders, smoothening the transition to a new legal situation.

Textile waste

Other waste



Policy

Country

Theoretical or Empirical Back-up

Clean Production Agreements (APLs) are voluntary partnerships between industry groups and public authorities to improve sustainability through specific goals and actions. Structured in three phases—conception, implementation, and certification—they involve audits and lead to a Clean Production Certificate valid for three years. An APL focused on new textiles is underway, led by Cámara Diseña Sustentable, addressing material management beyond waste. For second-hand textiles in Iquique, a separate APL is being considered, pending data collection and environmental impact assessments.

Practical Implementation

The APL “Circular Economy in First-Hand Clothing,” developed by Cámara Diseña Sustentable with support from the Ministry of the Environment, aims to foster a more sustainable textile industry. Over 24 months, it will implement waste management models and pilot projects to support the inclusion of first-hand clothing in the EPR Law.

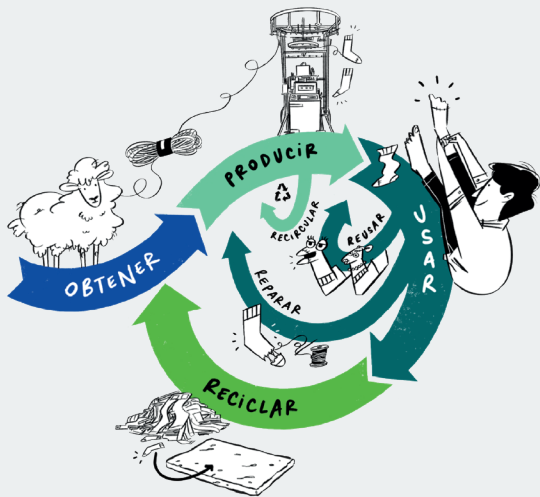
Stakeholders

Trade association Cámara Diseña Sustentable | MMA | Producers of textile

Related Patterns



Sources: (Cámara Diseña Sustentable, 2023) | (UNECE & ECLAC, 2024)



CIRCULAR ECONOMY STRATEGY FOR TEXTILE

23

To guide the transition of the textile sector on a national scale a strategy is needed to establish goals, required actions and roles and responsibilities.

Textile waste

Other waste

Theoretical or Empirical Back-up

The Circular Economy Strategy for the Textile Sector in Chile towards 2040 aims to guide actions and articulate efforts to prevent the generation of waste, prolonging the useful life of textiles, promoting quality, reuse and textile recovery, in order to protect the health of people and the environment; and strengthen the local development of the textile system and innovation. This will be accompanied by a regulatory framework that addresses design, traceability, transparency and the contributions of the textile sector in social, environmental and economic matters.

Practical Implementation

The strategy proposal formulates four main goals: 1) Decrease overconsumption of textile products; 2) Increase the number of formal jobs and trades linked to circular business models in textiles; 3) Increasing the valorization of textile waste; 4) Prevention and eradication of sites affected by the illegal disposal of textiles. The 20 initiatives and 38 actions to accomplish these goals are grouped into four main areas shared with the Roadmap for a Circular Chile by 2040: Circular Culture, Circular Regulation, Circular Territory and Circular Innovation.

Stakeholders

MMA | others varying per action

Related Patterns



Sources: (Ministerio del Medio Ambiente, 2024, p.7, 18 & 31)



SMARTER TOGETHER

24

Gathering interested parties to share knowledge stimulates the development of a smart, sustainable and circular economy and thus will reduce the production of waste.

Textile waste

Other waste

Event

Region

Theoretical Back-up

Tarapacá Smart is an annual event, gathering a multitude of actors involved or interested in the progress of a smart, sustainable, and circular economy, provides the opportunity to inspire, network, and exchange ideas, encouraging collaboration and stimulating the further development of projects and initiatives advancing a smart, sustainable, and circular economy in the region.

Practical Implementation

Entrance to the event is free to all. The programme includes presentations by experts, discussion panels and a sustainability fair, where local entrepreneurs present innovative and sustainable products.

The first edition was held in 2017 and since then it has become a yearly returning event until COVID and was resumed in 2023. The fifth and most recent edition was held in March 2024. A sixth has not yet been announced.

Stakeholders

CORFO | CircularTec | ZOFRI S.A. | GORE Tarapacá | MAHO | MIQQ | entrepreneurs | academics and students | general public

Related Patterns



Sources: (Programa – Tarapacá Smart, 2024) | (Tarapaca Smart, n.d.)



RECYCLING AT SCHOOL

25

Teaching children about the importance of recycling and individual environmental responsibility fosters a positive evolution in social culture preventing longterm continuation of the current problems.

Textile waste

Other waste

Campaign

City | Country

Theoretical Back-up

Educating children about recycling and environmental responsibility contributes to long-term cultural change by embedding sustainable values early in life. According to social learning theory, children model behaviors they observe and are more likely to adopt lifelong habits when introduced through education. Environmental education in schools cultivates awareness, critical thinking, and a sense of responsibility, laying the foundation for environmentally conscious citizens. By normalizing recycling from a young age, future generations are better equipped to reduce waste and support sustainability efforts, helping to break the cycle of environmental neglect and ensuring more resilient, responsible communities over time.

Practical Implementation

The topic of recycling can be integrated in the regular national syllabus or provided as interactive guest classes facilitated by a locally active NGO's or the municipality.

Stakeholders

Mineduc | School boards | Municipalities | NGO (Desierto Vestido) | Recycladores de base

Related Patterns

1

18

26

27

Sources: Interview official MAHO



RECYCLING, A DAILY TOPIC 26

A change in the waste collection system to improve recycling depends on citizen cooperation and therefore requires a promotional campaign to sensitize people to the importance of their role and integrate recycling as a habit in everyday life.

Textile waste

Other waste

Campaign

Country

Theoretical or Empirical Back-up

The introduction of the Extended Producer Responsibility Law (Ley REP) not only increases the responsibility of producers but also assigns a new role to consumers, who must separate their waste to enable recycling. The success of this shift relies on recycling becoming an integrated part of everyday life, culture, and public discourse. Embedding these behaviors socially and culturally is essential for achieving widespread compliance and long-term impact.

Practical Implementation

To raise awareness about the new collective management system for coordinating and financing the recycling of packaging and containers, one of the priority products under Ley REP, the “Reciclar es ReSimple” campaign was launched. A central feature of this campaign is the ReciClan, a group of personified recyclable materials created to engage and educate the public. An innovative tool within the campaign is a set of WhatsApp stickers featuring these ReciClan characters, encouraging people to weave recycling messages into their everyday digital conversations and making sustainable behaviors more relatable and fun.

Stakeholders

GRANSIC (ReSimple) | general public

Related Patterns

3

4

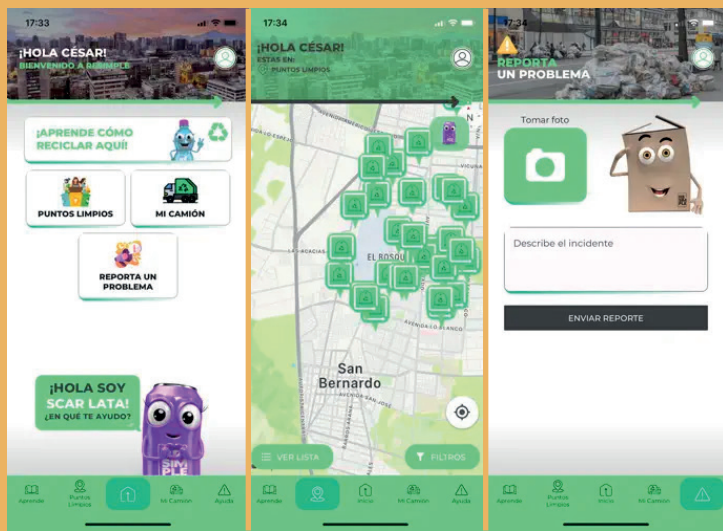
5

18

25

27

Sources: (ReSimple | NOSOTROS, n.d.)



ACCESSIBILITY TO PRACTICAL INFORMATION

27

Accessibility to practical information such as where to find collection points, opening hours, waste collection schedules etcetera is crucial for successful implementation of waste collection services.

Textile waste

Other waste

Theoretical Back-up

Access to clear, practical information is essential for effective public participation in waste management. People are more likely to adopt new habits, such as sorting or properly disposing of waste, when barriers to action are minimized. Lack of access to information, such as collection schedules or locations of recycling points, often leads to non-compliance or misuse of services. Transparent and accessible communication empowers citizens, builds trust in public systems, and increases the likelihood of sustained participation in recycling programs.

Practical Implementation

To improve accessibility to information, user-friendly mobile applications can be implemented to provide up-to-date information on collection points, opening hours, and pickup schedules. Additionally, municipalities can engage directly with residents during juntas vecinales (neighborhood meetings), where a municipal officer is present to answer questions, clarify procedures, and promote positive recycling habits.

Stakeholders

Municipalities | GRANSIC (ReSimple) | general public

Related Patterns



Sources: Interview official MAHO



PARTICIPATIVE PLANNING

28

Involving citizens in spatial planning stimulates people to think about their living environment and helps to incorporate the wishes of citizens into interventions and policies, strengthening citizens relation to the the city and environment fostering a sense of care.

Textile waste

Other waste

Campaign | Event

City

Theoretical or Empirical Back-up

Participative planning is important for meaningful citizen engagement. It involves listening to people's opinions and experiences to better understand their needs and priorities. At the same time, it is essential to share information so citizens can reflect and respond with informed input. This two-way exchange helps create more balanced, realistic decisions and builds a stronger connection between people and the places they live in.

Practical Implementation

The development of the Imagen Objetivo for Improved Liveability in Alto Hospicio and Iquique by Corporación Ciudades included a series of ten participative seminars, each focussed on a different topic, such as mobility, housing or public spaces. The first of these sessions started with the presentation of the results of a survey regarding the perception and preferences of the inhabitants of Iquique - Alto Hospicio in relation to the context of the city, its characteristics and desires of future vision.

Stakeholders

Urban planners and designers (Corporación Ciudades) | Municipalities (MAHO) | GORE Tarapacá | participants

Related Patterns

29

30

42

Sources: (Corporación Ciudades, 2023)



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

15

28

30

41

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



TERRITORIAL OFFICE

30

The newly established Metropolitan Area (AM, after its Spanish acronym) needs a representative space in the territory to work on the development of projects and generate visibility for residents.

Textile waste

Other waste

Infrastructure

Neighborhood

Theoretical or Emperical Back-up

Led by Environmental Engineer this will be focussing on the development of projects regarding the environment, one of the four main topics for the AM together with housing, connectivity and public works. Moreover, the aim of this office located in a residential area is to foster community involvement in the development of projects carried out under the authority of the AM.

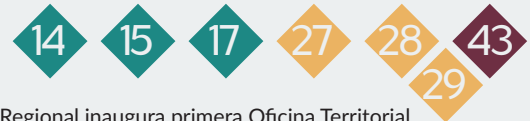
Practical Implementation

In March 2024, the first 'Oficina de Vinculación Territorial del Área Metropolitana Alto Hospicio - Iquique' (Territorial Liaison Office of the Alto Hospicio - Iquique Metropolitan Area) was opened at Pasaje Isidora 390 in the Autoconstrucción sector, Alto Hospicio. The initiative is a public-private collaboration, including the Collahuasi Fundación (a large mining company in the region). At the opening, representatives of the founding institutions were present, as well as local neighborhood leaders.

Stakeholders

AM IQQ-AHO | GORE Tarapacá | Sponsors (Collahuasi Foundation) | | residents

Related Patterns



Sources: ("Gobierno Regional inaugura primera Oficina Territorial en el Área Metropolitana Alto Hospicio - Iquique," 2024)



TEXTILE RECOVERY WORKSHOPS

Offering textile workshops enables people to repair and adjust clothes, increasing the longevity of clothing and reducing textile waste.

31

Textile waste

Other waste

Event

City

Theoretical or Empirical Back-up

Knowledge and skill sharing regarding the repair and reuse of textiles empowers individuals to recover used textiles instead of discard them, increasing the longevity of textile items and thus reducing textile waste.

Practical Implementation

Workshops are held creative workshops center, such as *Casa de Oficios* in Iquique, or as part of a larger event such as *Tarapacá Smart*, or even at a pop-up stand at a much visited location such as the *ZOFRI-Mall*. Public is drawn through announcements on socia media.



Attention

It is not quite realistic that everyone will repair and reuse all their future used textiles themselves - a scenario which in fact would be even problematic for professional tailors dedicated to clothing repair. Evenso, workshops of this kind do promote awareness to consider no longer wanted textiles as repairable or reuseable, motivating people to adequately dispose of these textiles at collection points so that the material can still be recycled.

Stakeholders

NGO (Desierto Vestido) | Local fashion designer | general public

2

23

34

Related Patterns

Sources: (Desierto Vestido, 2022)



CLOTHING EXCHANGE

32

Events where participants can 'shop' for clothes in exchange for clothes they previously handed in stimulate consumerism awareness and reduce textile consumption, in turn reducing textile waste.

Textile waste

Other waste



Event

City

Theoretical or Empirical Back-up

Many people possess clothing that they no longer use, in spite of its good condition. Initiatives to facilitate an exchange of clothing, prevent people from disposing of items in good condition, thus reducing unnecessary generation of textile waste. Moreover, it satisfies the participants' needs for wardrobe renewal without having to buy new clothes, reducing textile consumption.

Practical Implementation

Days or hours before the event, participants can hand in clothing items in good condition in exchange for coupons. These coupons can later be used during the event to 'buy' another item that was previously handed in by someone else. Depending on the intentions of the organizing party, items can also be bought with money instead of a coupon to raise money for charity or to cover the expenses of the event.



Attention

A plan needs to be in place to responsibly dispose of any left-over items.

Stakeholders

Students | Sponsors (ZOFRI S.A.) | Participants | Local fashion designers

Related Patterns



Sources: (Diario El Longino, 2025) | Fieldwork conversations



REDISTRIBUTE

33

An alternative destination can be found for clothing items discarded in the desert by making them available worldwide.

Textile waste

Other waste

Campaign

Site | World

Theoretical Back-up

Re-commerce Atacama is a project by Desierto Vestido in collaboration with Fashion Revolution and VTEX. The aim of the project is to get clothing out the desert of Alto Hospicio in a meaningful way. In addition to removing discarded textile from the desert this project is protesting the fashion production industry, raising awareness, achieving active engagement and returning the problem to the world.

Practical Implementation

Activists go to textile landfills, where they sort out and retrieve valuable items that will be washed, if needed repaired, and “sold” online for free. Customers pay only for shipping costs.

The first collection of 300 items was released on March 17th 2025 and sold out within five hours, proving that online fashion consumers are interested in being part of the solution rather than the problem.



Attention - As the price for an item is zero, that means this pattern depends on unpaid labor for collecting, cleaning and packing.

Stakeholders

NGO (Desierto Vestido) | Activists | Fashion consumers worldwide

34

37

Related Patterns

Sources: (Johnson, 2025) | (Re-commerce Atacama, 2025)



RESCUE AND REDESIGN

34

By reusing textile rescued from clandestine landfills and micro dumps in the desert, local fashion designers can give a new life to wasted textile while reducing environmental contamination.

Textile waste

Other waste

Enterprise | Product

Site | City

Theoretical or Empirical Back-up

Piles of textiles waste on dumpsites are frequently set on fire, but even when they are simply left they get burned by the strong desert sun over time, severely damaging the material quality and reducing their potential to be recycled in any way.

Practical Implementation

To prevent this, local activists and fashion designers frequently visit clandestine landfills and microdumps to collect textile items in good condition. On a small scale this reduces the amount of environmental contamination. Moreover, the rescued items are used as base materials to make unique designs, giving them an new value.



Attention

Scavenging these wastescapes is not without risk and some local fashion designers therefore prefer to 'rescue' textile items from markets such as La Quebradilla. In this way they are less directly contributing to the reduction of environmental contamination by not using virgin materials and by preventing textiles they buy on the market might end up on such dumpsites.

Stakeholders

NGO (Desierto Vestido) | Local activists | Fashion designers

Related Patterns

11

22

23

31

32

39

33

Sources: (Calderón, 2024) | Fieldwork conversations



PICTURE OR IT DIDN'T HAPPEN

35

In order to raise awareness about environmental contamination, such as clandestine textile landfills, exposure through striking visual evidence is essential.

Textile waste

Other waste

Campaign | Product

World

Theoretical or Empirical Back-up

A picture speaks a thousand words. Striking visual testimony is therefore the most powerful tool to generate awareness by triggering an emotional response of shock and concern.

Practical Implementation

Various stakeholders have made efforts to make visual records of the clandestine textile landfills. An impressive photo series demonstrating the magnitude of the textile dump and highlighting social impact was published by AFP photographer Martin Benetti. Drone footage of a gigantic fire at one of the biggest textile landfills was recorded by Cheng Hwa, a student at the Fashion System Observatory. These images of professional quality have been spread through international journalism platforms generating worldwide attention for the issue. NGO Desierto Vestido frequently posts photos and videos of fieldwork visits to dumpsites and smoke clouds rising up seen from across the city, targeting a more local audience with mobile phone visual records from smartphone cameras.

Stakeholders

NGO | Photographers | Media outlets | Worldwide audience

Related Patterns

36

37

38

39

Sources: (Benetti, 2021) | (Shipley & Alarcón, 2024)



STORY TELLING

36

The explaining of the problem through documentaries, podcasts, written articles and social media posts help a wider audience to understand the nature of the problem.

Textile waste

Other waste

Theoretical or Empirical Back-up

Effective communication plays a crucial role in shaping public perception and generating collective awareness. Storytelling through diverse media formats—such as documentaries, podcasts, articles, and social media—enables people to engage emotionally and intellectually with the issue at hand. By making environmental challenges more relatable and visible, media exposure fosters civic interest, encourages behavior change, and builds societal pressure on both public and private actors to take action.

Practical Implementation

Publications across a range of formats—including podcasts, written articles, news items, and documentaries—have told the story of illegal textile waste accumulation in the Atacama Desert. These have appeared globally, including in the USA, Germany, Italy, and Ireland. Many of these works are (partially) based on interviews with members of the local NGO Desierto Vestido, helping to amplify the voices of those directly engaged in the issue.

Stakeholders

NGO | Journalists | Documentary makers | Media outlets | Journalism platforms | Worldwide audience

Related Patterns

24

35

37

38

39

Sources: (DW Documentary, 2022) | (Joy, 2022) | (Maggioni, 2024) | (Shipley & Alarcón, 2024) | (Uribe, 2021)



ART PROJECTS

37

An art project critiques the status quo, provoking its audience to reflect on modern society and their role within it, reshaping their perception of (for example) the textile industry and encouraging them to reconsider their actions and habits.

Textile waste

Other waste

Campaign | Product

Country

Theoretical or Empirical Back-up

Art projects have the power to provoke reflections in their audience about abstract dilemmas such as the what will be the heritage of our modern society in comparison to the heritage left to us by our ancestors.

Practical Implementation

The largest humanoid geoglyph on earth, El Gigante de Tarapacá, is situated not far from Iquique-Alto Hospicio. The replica, made from textile waste retrieved from the same desert, represents the mirage between the marks left on the desert landscape left by previous civilizations and the impact by our current consumerist society. Referencing cultural heritage in a modern artwork provokes the audience to contemplate on what will be the heritage of today's society. By constructing the artwork in several parks in Santiago, the country capital, El Gigante Vestido took the demonstration of their reflection to a national scale.

Stakeholders

Artists | Students | Sponsors

(Example El Gigante Vestido: Teachers and students from Universidad Finis Terrae | Municipalidad de Huará | MAHO | Rembre | PARQUEMET | Padre Hurtado | SoyProvidencia)

Related Patterns

33

35

36

39

Sources: (Echeverría & García, 2021)



LAW SUIT

38

Filing a law suit is a powerful tool for civilians or activists to demand responsible entities - private or public - to comply with legal obligations to take care of the environment.

Textile waste

Other waste

Campaign | Policy

Region

Theoretical or Empirical Back-up

Government institutions have a responsibility and legal obligation to enforce environmental legislation. Persistent illegal activities, such as the dumping of waste in clandestine landfills, must therefore be properly addressed. However, due to budget constraints and bureaucratic hurdles, authorities may struggle to take effective action. In such cases, a court ruling can serve as a decisive push to break the impasse, prompting more concrete measures or securing increased funding to ensure proper enforcement.

Practical Implementation

In March 2022, Iquiqueña and attorney Paulin Silva filed a lawsuit before the Primer Tribunal Ambiental to determine the responsibilities of the Municipality of Alto Hospicio and the Chilean government, regarding the issue of textile waste accumulation in the desert.



Attention

A law suit may provoke cautious or even hostile attitudes damaging the potential for collaboration between stakeholders.

Stakeholders

Activists | Lawyers | Courts (Primer Tribunal Ambiental | Municipalities (MAHO) | Gobierno de Chile

Related Patterns

15

35

36

43

Sources: (Órdenez, 2024) | (Primer Tribunal Ambiental, 2022)



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



Event

World

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 Maurício 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

34

35

36

37

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

15

29

47

48

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



DEFRAGMENT URBAN FABRIC

41

Cohere in urbanity is required to prevent the existence of no-spaces that prone to becoming dumpsites.

Textile waste

Other waste

Theoretical or Empirical Back-up

The commune of Alto Hospicio has experienced extreme population growth over recent decades, resulting in rapid urban expansion lacking spatial strategy. This has led to a fragmented urban fabric, especially on the periphery, where informal settlements, isolated real estate projects, industrial zones, and vacant plots form a disjointed patchwork. The lack of coherence in urban morphology means a high prevalence of undefined spaces inbetween different urban morphologies, or no-spaces, which are highly prone to becoming micro-dumps due to their neglect and ambiguity.

Practical Implementation

The Plan Regulador Comunal (Municipal Zoning Plan), which in Alto Hospicio is currently due for renewal, offers a strategic opportunity to reduce urban fragmentation. By clearly defining future land uses and urban morphologies, and aligning zones for expansion with existing disconnected developments, the plan can guide the creation of a more continuous, cohesive urban landscape. This not only improves urban livability but also helps prevent the emergence of neglected no-spaces vulnerable to illegal dumping.

Stakeholders

MAHO | Urban planners and designers | MINVU | CChC

Related Patterns

42

45



LEGALIZE INFORMAL SETTLEMENTS

42

Legalizing informal settlements (*tomas*) by officially transferring ownership to their inhabitants enables the municipality to better organize waste management in these locations.

Textile waste

Other waste

Policy

Neighborhood

Theoretical or Empirical Back-up

The waste management budget of the Municipality of Alto Hospicio is allocated based on its registered population, excluding the significant portion of its residents living in *tomas*. Additionally, municipal services such as regular waste collection cannot legally be provided outside formally recognized urban areas. Legalizing informal settlements would address both challenges.

Practical Implementation

Chile has a precedent for legalizing informal settlements. In 2001, President Ricardo Lagos launched the “Plan Integral,” which regularized thousands of households in camps such as La Pampa, El Boro, and La Negra. More recently, the Ministry of Housing and Urbanism (MINVU) has selected 272 camps that have been built on state-owned lands and will be part of the Construyendo Barrios (Building Neighborhoods) program. The program will transfer ownership to the occupiers.



Attention

Legalization can only occur for settlements on state-owned land, and only if they meet age criteria, to avoid incentivizing new land occupations.

Stakeholders

MINVU | Bienes Nacionales | Inhabitants informal settlements

Related Patterns



Sources: Interview Official MAHO | (Thomson, 2023)



CONTAIN CLANDESTINE LANDFILLS

43

To prevent continuation or further escalation of the on site illegal activities at clandestine landfills they should be registered into the *Plan Regulador* - the zoning plan - as contaminated areas that require surveillance and restricted access to prevent further contamination.

Textile waste

Other waste

Policy

Site

Theoretical or Empirical Back-up

Currently, there is no viable solution for the removal of large clandestine landfills in the region, as the volume of waste they contain would overwhelm the existing sanitary landfill. Until an appropriate solution is found to manage these volumes, a containment strategy is necessary to prevent further deterioration of conditions at these sites.

Practical Implementation

Clandestine landfills should be formally recognized in the *Plan Regulador Comunal* (Municipal Zoning Plan) as contaminated zones awaiting recovery. This designation should be accompanied by clearly defined interim actions under a containment strategy. These may include perimeter fencing to restrict access, surveillance, and warning signs to prevent further dumping.



Attention

Restricting illegal activities at existing dumpsites does not guarantee their complete cessation. If not accompanied by preventive measures that address the underlying incentives, such efforts may simply lead to the spread of contamination to other areas.

Stakeholders

MAHO

Related Patterns



Sources: Fieldwork | Interview Official MAHO



ROADSIDE BARRIERS

44

Roads outside of the urban area need to be equipped with road side barriers to prevent vehicles from going off the road to dump waste by the roadside or along unofficial dirtroads leading deeper into the desert landscape.

Textile waste

Other waste

Spatial Intervention

Region

Theoretical or Empirical Back-up

Spatial analysis reveals that illegal dumpsites often emerge along informal, off-road tracks branching from intercommunal roads. These tracks provide unregulated access to remote areas, enabling clandestine waste disposal. Installing roadside barriers to block off-road access is an effective spatial deterrent strategy. By physically restricting vehicle access to open land, such measures help reduce the opportunity for illegal dumping.

Practical Implementation

Roadside barriers should be installed along intercommunal roads to limit unauthorized access to open land, thereby inhibiting illegal off-road activities such as waste dumping. By restricting interruptions in the roadside barriers to a few designated access points, surveillance efforts and enforcement measures, such as warning signs and monitoring, can be concentrated at these locations. This is particularly important because the territory outside the urban limits is too vast to monitor effectively if access remains unrestricted.

Stakeholders

MAHO | GORE Tarapacá | Seremi de Obras Publicas

Related Patterns



Sources: Fieldwork



NO TO NO-SPACES

45

Streetprofiles need to be designed from facade to facade clearly distinguishing use of space through adequate paving to discourage people from dumping waste onto strips of undetermined space.

Textile waste

Other waste

Spatial Intervention

Neighborhood | City

Theoretical or Empirical Back-up

During fieldwork I noticed micro dumps within the urban area occurred mostly in spaces that I would refer to as no-spaces. Different from the by Marc Augé coined Non-Places (1992), no-spaces in this case are unpaved surfaces that are undefined in use or function, nor demonstrate ownership in any way. These characteristics make such spaces susceptible to becoming micro dumps.

Practical Implementation

Getting rid of no-spaces within the urban area requires an elaborate urban project to make a streetprofile designs for every street within the urban area. The basic requirements for these streetprofile designs is that they extend from the facade to facade and clearly define adequate paving for each strip in accordance to its function is the design, thus not leaving any left-over no-space.

Stakeholders

Municipalities (MAHO) | Urban designers

Related Patterns

42

43

46

47

48

Sources: Fieldwork



SLOW TRAFFIC INFRASTRUCTURE

46

More infrastructure for slow traffic stimulates people to go on foot or by bike, moving through the city at a slower pace, fostering a stronger connection between citizens and territory, increasing their sense of care for their living environment.

Textile waste

Other waste

Infrastructure

Neighborhood | City

Theoretical or Empirical Back-up

Traffic in Alto Hospicio and Iquique is heavily car-dominated, partly due to the increased affordability of vehicles through the ZOFRI (Free Trade Zone). Developing infrastructure for slow traffic, such as pedestrians and cyclists, encourages active mobility. Moving through the city at a slower pace fosters a stronger connection between residents and their surroundings, enhancing their sense of responsibility and care for the local environment.

Practical Implementation

Incorporating sidewalks and bike lanes into the design of major roads is essential to ensure the safety and accessibility of slow traffic. In areas of urban expansion or renewal, dedicated pedestrian and cycling paths, free of motorized traffic, can be implemented. These routes offer a more interconnected network and more pleasant alternatives for non-motorized mobility, making walking and cycling both safer and more attractive.

Stakeholders

Municipalities | Urban planners and designers

Related Patterns

45

Sources: Fieldwork | (Corporacion Ciudades, n.d.-e)



QUALITY PUBLIC SPACES

47

Public spaces of high quality such as parks and plazas invite citizens to spend time outdoors and generate a positive perception of the city both stimulating a sense of care for their living environment.

Textile waste

Other waste

Infrastructure

City

Theoretical or Empirical Back-up

Iquique and Alto Hospicio have only 2.13 m² and 3.29 m² of green space per inhabitant, respectively—barely a third of the 10 m² per capita standard recommended by SIEDU. Furthermore, only 2.1% of the urban area has any form of vegetation cover, the lowest percentage in the entire country.

Practical Implementation

Parque Urbano Santa Rosa, covering 5.5 hectares, represents a major public investment of 3,500 million pesos. It includes picnic areas, pedestrian walkways, bike paths, hiking trails, three large scenic overlooks, and a plant nursery to supply vegetation for the park itself. It is the first park in the region to be managed by SERVIU. In collaboration with the National Forest Corporation (CONAF), native vegetation has been planted not only in Parque Urbano Santa Rosa but also in other parks, plazas, and housing projects.



Attention

Water availability is essential for sustaining plant life in the park. However, due to the permanent absence of rainfall, potable water is currently used. Average water consumption in the park reaches 130 m³ per month.

Stakeholders

Municipalities | SERVIU | MINVU | CONAF | general public

Related Patterns



Sources: (Corporación Ciudades, 2024) | (Jorquera Jorquera & Grandjean Balboa, 2019) | ("Parque Santa Rosa," 2024) | (Pavez, 2024)



EMBELLISHMENT, GREENERY AND SHADING

48

Embellishment, greenery and - given the climate - shading elements are crucial tools to prevent the occurrence of undetermined spaces susceptible to waste dumping, while also improving the perception of public spaces such as parks and plazas as well as streets, contributing to a sense of care for their living environment in citizens.

Textile waste

Other waste

Spatial Intervention

Site | Neighborhood | City

Theoretical or Empirical Back-up

Urban embellishment and greenery enhance the perception of the city and improve residents' experience of their environment. Additionally, the presence of shading elements increases comfort, especially in hot or arid climates.

Practical Implementation

In 2022, the recovery of Playa El Colorado in Iquique for public recreational use included large shading structures and decorative elements such as murals.

The incorporation of greenery, shading, and aesthetic enhancements should not be limited to recreational areas but extended to transitional public spaces as well—such as integrating shade structures along primary pedestrian routes.



Attention

When incorporating greenery into public spaces in a desert climate, irrigation methods and water usage must be carefully planned and sustainably managed.

Stakeholders

Municipalities | Urban designers | general public

Related Patterns



Sources: Fieldwork | (Corporacion Ciudades, n.d.-a) | (Municipalidad de Iquique, 2022)

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