

Craft beer as an engine of change:

using systemic design to foster connections
in the San Diego-Tijuana cross-border region,
World Design Capital 2024.



**Politecnico
di Torino**

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Candidates

Aline Di Campi
Giulia Galante

Supervisor

Prof. Pierpaolo Peruccio

Co-supervisor

Prof. Mai Nguyen
Prof. Gianluca Grigatti

abstract

The thesis project is situated within the historical and geopolitical debate on borders, examining the environmental, economic, and social impacts they generate. Today, there are over fifty border walls worldwide, about half of which were built in the last decade. This trend reflects the desire of states to concretely delineate a distinction between "us" and "them", although alternative solutions such as international cooperation and sustainable development may offer more lasting results. Despite historical and contemporary evidence demonstrating that walls are ineffective in addressing migration, crime, terrorism, and drug and human trafficking, they continue to proliferate, hindering social cooperation and dividing families and communities.

The analysis presented within this thesis focuses on one of the busiest borders, the one between Mexico and the United States, focusing on the section between San Diego and Tijuana. This region represents a unique case study of a barrier that has historically, and continues to act, not only as a boundary but also as a bridge. This distinctive connection was a driving force behind the candidacy and subsequent selection of the region as the World Design Capital 2024. The objective of the thesis is to contribute to the initiatives of WDC 2024 by building a metaphorical bridge between the two cities, using a systemic methodology to present the region as a united territory. This involves promoting collaborations and reducing prejudice and social stigma, with the goal of fostering a cohesive community.

To understand the current system intrinsic to San Diego and Tijuana, a holistic analysis was conducted, encompassing both desk and field research across social, economic, and environmental domains. This research identified the complex problems of the region, but also highlighted multiple potentials, such as the successful internal collaboration within the craft beer industry. The investigation of the craft beer sector was the subject of further analysis involving collaboration with two of the region's craft breweries, aimed at a deep understanding of the production process and the flows of inputs and outputs. The identification of challenges and opportunities within the sector and the region laid the foundations for development of a new network system among the breweries and other local stakeholders.

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A NEW BEGINNING

gate

In recent decades, the border between the United States and Mexico has become a **symbol of political contention** between parties, accentuated by the construction of a physical barrier separating the two nations. This contention has influenced the **socio-cultural dynamics** of the cities straddling the barrier, specifically the case study examined in this thesis: **San Diego and Tijuana**, situated on the western coast of their respective countries, the United States and Mexico. As will be analyzed in various sections of this thesis, despite the physical barrier impeding cross-border exchange dynamics, the region remains a **hub of vibrant economic and cultural exchange**.

San Diego and Tijuana represent a **unique case** where the border is not merely a line of separation but also a **bridge of cooperation and territorial development**. This duality has been recognized internationally, with the designation of the two cities as **World Design Capital 2024**. Hence, how can design contribute to the sustainable development of San Diego and Tijuana? What are the specific challenges and opportunities in this unique context?

The objective of this thesis is to contribute to the WDC 2024 initiatives by **constructing a metaphorical bridge** between the two cities **through systemic design**, starting from one of the region's assets: the **craft beer sector**, which thrives on both sides of the border. The research employs a systemic methodology, aiming to present the region as a **unified territory**, **promote collaborations**, and **reduce prejudice and social stigma**.

This thesis is structured into two volumes. The first volume presents **desk and field research** aimed at identifying the challenges and opportunities of the region. The second volume builds on these **challenges and opportunities**, focusing on the **new system and design guidelines**. The first volume includes a summary of the research work, with the initial three chapters analyzing the context that fostered the flourishing of this design initiative, specifically the WDC 2024, and describing the methodology employed. The subsequent two chapters of the first volume provide the results of the desk and field research applied to the region and the craft beer sector. Finally, the second volume will present the design possibilities emerging from the research and the identification of opportunities, which will serve as the foundation for the **development of the new system** and its **subsequent evaluation**.

the WDO

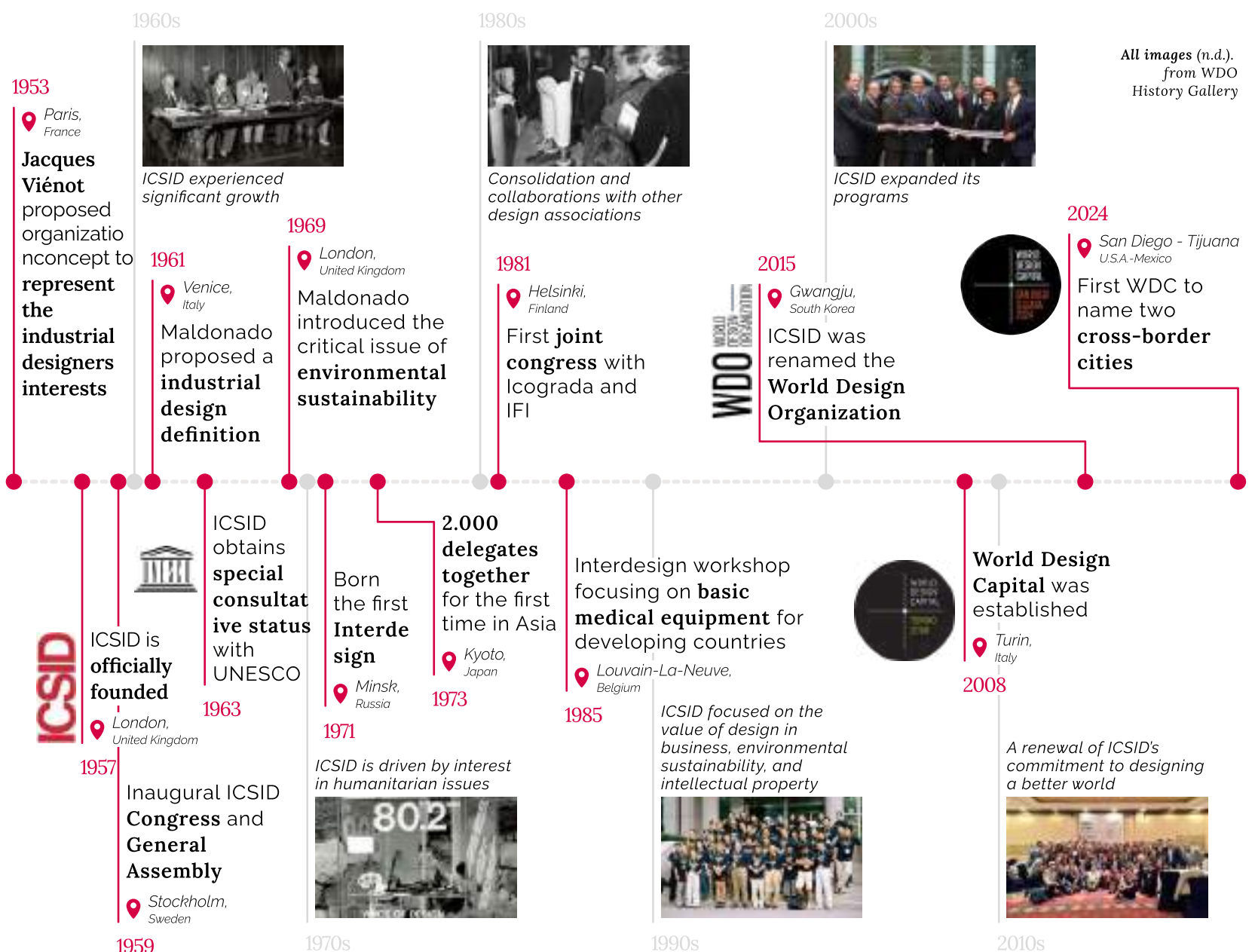
1.1 A STORY

1.2 A MISSION

1.3 THE WDC

1.4 THE 2024 CHOICE

1.1 a story



All images (n.d.).
from WDO
History Gallery

The International Council of Societies of Industrial Design (ICSID), rebranded as the World Design Organization (WDO) in 2015, is a **non-governmental international organization** established in **1957**.¹

The concept of establishing an organization to represent the interests of industrial designers was proposed four years earlier by **French designer Jacques Viénot** during the **International Congress of the Institut d'Esthétique Industrielle**. This concept materialized through the collaborative efforts of French architect Pierre Vago, German-American designer Peter Muller-Munk, and Russian-British architect and designer Misha Black.² However, it was not until two years post-foundation that the inaugural **ICSID Congress and General Assembly** were convened in **Stockholm**.³

In the 1960s, ICSID experienced significant growth, expanding its membership to over 40 organizations from more than 30 countries. By 1963, ICSID had attained **special consultative status** with UNESCO, collaborating on numerous development projects that leveraged design to **enhance human conditions**.³ A pivotal figure within ICSID and the field of systemic design was the designer Tomás Maldonado. At the 1961 ICSID Congress in Venice, Maldonado proposed a **definition of industrial design**, which was formally adopted by ICSID in **1969**.⁴ It was during the 1969 Congress in London that Maldonado introduced the critical issue of **environmental sustainability**, referring to it as **"the problem of all problems"**.⁵

The 1970s marked a significant turning point for ICSID, driven by an interest in **humanitarian issues**, leading to the introduction of the **Interdesign program**. In **1971**, industrial designers from around the world were brought together in Minsk, then part of the Soviet Union, to participate in the inaugural workshop focused on a problem of both regional and international relevance, namely **"The Production and Distribution of Bread"**.² These years also saw the strengthening of ICSID's role as a **bridge-builder**. In 1973, during the Congress and General Assembly held in Kyoto, Japan, 2,000 delegates from Western and Asian design communities participated.³

The 1980s witnessed organizational consolidation and the beginning of collaborations with other design associations. In **1981**, ICSID organized its first **joint congress** with the International Council of Graphic Design Associations (Icograda) and the International Federation of Interior Architects/Designers (IFI) in Helsinki, Finland.²

Notably, in **1985**, in collaboration with UNESCO and IFI, ICSID³ held an Interdesign workshop in Louvain-La-Neuve, Belgium, focusing on **basic medical equipment** for developing countries.²

During the 1990s, the organization increasingly focused on the value of design in **business, environmental sustainability, and intellectual property**.³

With the turn of the century, ICSID expanded its programs. In **2008**, in Turin, the **World Design Capital (WDC)** program was established to **celebrate** the **achievements of cities** that have utilized design as a tool to reinvent themselves and improve the quality of life for their citizens.³

The year **2015** marked a renewal of ICSID's commitment to designing a better world. During the General Assembly in Gwangju, South Korea, the organization was renamed the **World Design Organization**, reflecting a renewed constitution and a broader accessibility to the global design community.³

Presently, the WDO encompasses a global network of over **200 member organizations** from more than 40 countries.⁵

1.2

a mission

The organization's mission is to mobilize the industrial design community to address **social and environmental challenges** through initiatives that inform, engage, and empower design as a tool to **enhance economic, social, cultural, and environmental** quality of life. ⁶ To advance this objective, the WDO endorses 7 of the 17 United Nations **Sustainable Development Goals**, a set of targets adopted by UN member states to tackle some of the world's most pressing challenges. ⁶

Currently, the WDO administers various programs aimed at addressing **global challenges** through design, focusing on economic, social, cultural, and environmental themes. These programs foster **collaboration** across multiple levels, engaging companies, established designers, and students.

The **Interdesign** program, the oldest of its initiatives, launched in **1971**, aims "**to address local problems of global significance**" ⁷ through two-week workshops hosted by local organizations or consortia. These workshops explore **local issues** and seek **innovative solutions**. ⁷

The **Corporate Circles** program provides a platform for **information sharing** and **networking** among high-level corporate designers. This program seeks to unite industry professionals to exchange best practices, challenges, and solutions to obstacles. ⁸

Introduced in 2020, the **Young Designers Circle** program engages young designers, allowing them to **develop their perspectives and voices** within the design community or within a corporate context. ⁹

The **World Design Protopolis** program offers selected cities or communities design knowledge and resources, aiming to **make them accessible** across diverse social and economic contexts. ¹⁰

Since 2016, the WDO has also promoted **World Design Talks**, one-day workshops that address themes aligned with the 2030 Agenda. ¹¹

The WDO regularly organizes events, including the **World Design Congress**, a triennial event open to all interested in industrial design. ¹² The **General Assembly**, which reviews the current state of global design, ² is an exclusive event for members.

Recurring events also include **World Industrial Design Day**, celebrated annually on **June 29**, ¹³ and the designation of the World Design Capital, awarded biennially to cities that effectively use design to drive economic, social, cultural, and environmental development. ¹⁴

“ As the international voice for industrial design, we advocate, promote, and share knowledge of design driven innovation that has the power to create a sustainable and better world. ”

WDO mission

1.3

the WDC

Since **2008**, the World Design Organization committee has **biennially** elected the **World Design Capital** with the aim of promoting and encouraging the economic, social, cultural, and environmental development of cities globally through the use of design. ¹⁵

The primary purpose of this program is to advocate for the use of design as a tool for **urban development**. The core objectives of the program include promoting the city, with particular attention to its **design community**, and increasing **citizens' awareness** of the role of design as a driver for urban development. The importance of design in playing a crucial role in urban development should serve as a model for other cities, in order to create an **international network** where cities with a similar level of development can share best practices and thrive economically, socially, culturally, and environmentally. ¹⁶

*WDC San Diego-Tijuana Signing ceremony (2024).
from WDC San Diego-Tijuana Gallery*





WDC San Diego-Tijuana (2021).
from AIA San Diego

what it means?

Throughout the year, various events are organized and promoted to **showcase the local achievements** attained through the use of design to a local, national, and international audience. These distinctive WDC events, in collaboration with WDO, are described below.

The first event is the **WDC signing ceremony**, which invites key stakeholders, including government officials, the design community, local media, and businesses. This event does not take place in the designated year but in the first quarter of the year following the announcement, with the aim of **instilling pride** in the city among its population.¹⁶

Subsequent events are specific to the designated WDC year. The beginning of the WDC calendar year is celebrated with the **World Design Street Festival**, during which citizens are **directly engaged** through concerts, public design workshops, and exhibitions, with the intent of **raising awareness** about the importance of design as a means to improve quality of life.¹⁶

Focusing on user experience, the **World Design Experience week** allows designers from around the world to present their projects reinterpreted through the annual WDC theme.¹⁶

The most content-rich event is the **World Design Policy Conference**, during which ideas, insights, and best practices are **exchanged** from various countries, regions, and cities that are developing, launching, and maintaining effective design policies.¹⁶

The creation and active maintenance of the international network of cities is fostered through the dedicated event, the **World Design Network of Cities Meeting**, which aims to **highlight the successes** of WDC legacy programs and **identify collaboration opportunities** between designated WDC cities and other design-effective cities.¹⁶

Finally, the last event of the WDC year is the **convocation ceremony**, during which the year's successes are celebrated, reflections on the WDC legacy are offered, and the WDC title is handed over to the incoming city.¹⁶

the past choice cities

The designation of a city as the World Design Capital is based on a series of criteria that reflect the city's **ability to integrate design** into its social, economic, cultural, and environmental structure. The goal is for the designated World Design Capital to have a **concrete opportunity** to use design as a catalyst for positive and sustainable change.

The primary selection criteria for a WDC are listed below:

- **Existing design assets within the city:** this includes the presence of a **rich heritage** in design, architecture, urban planning, and educational institutions dedicated to design, as well as an active community of designers who have contributed to the city's development and the improvement of residents' quality of life.
- **The city's ability to use design as a tool for urban renewal:** this involves having **clear strategies** and **concrete projects** that utilize design to address challenges and stimulate innovation.
- **The ways in which citizens benefit from the use of design in city planning:** design should promote social inclusion, community participation, and overall well-being.
- **The mobilization and participation of the broader design community and various sectors of the population and visitors:** it is essential to involve **diverse actors** across different territorial scales and interests to achieve broader engagement and greater results.
- **The promotion of a broader dialogue on urban revitalization strategies:** this includes the sharing of best practices and the creation of global networks that can serve as models for other cities in their development through design.
- **The capacity to organize and finance a year-long program of design events.** ¹⁶

The designation of a city as the World Design Capital has played a pivotal role in promoting **sustainable development** on multiple fronts: economic, social, cultural, and environmental. Specifically, these cities have initiated a range of initiatives contributing to their progress by **fostering extensive networks** of design professionals. These networks have not only facilitated the exchange of knowledge and ideas but have also fostered **synergies** among various sectors and stakeholders within the cities to enhance citizens' quality of life.

2020

Lille Metropole,
France

Embracing the theme "**Design is Capital**", the city showcased the diversity and dynamism of design projects within the region.

2018

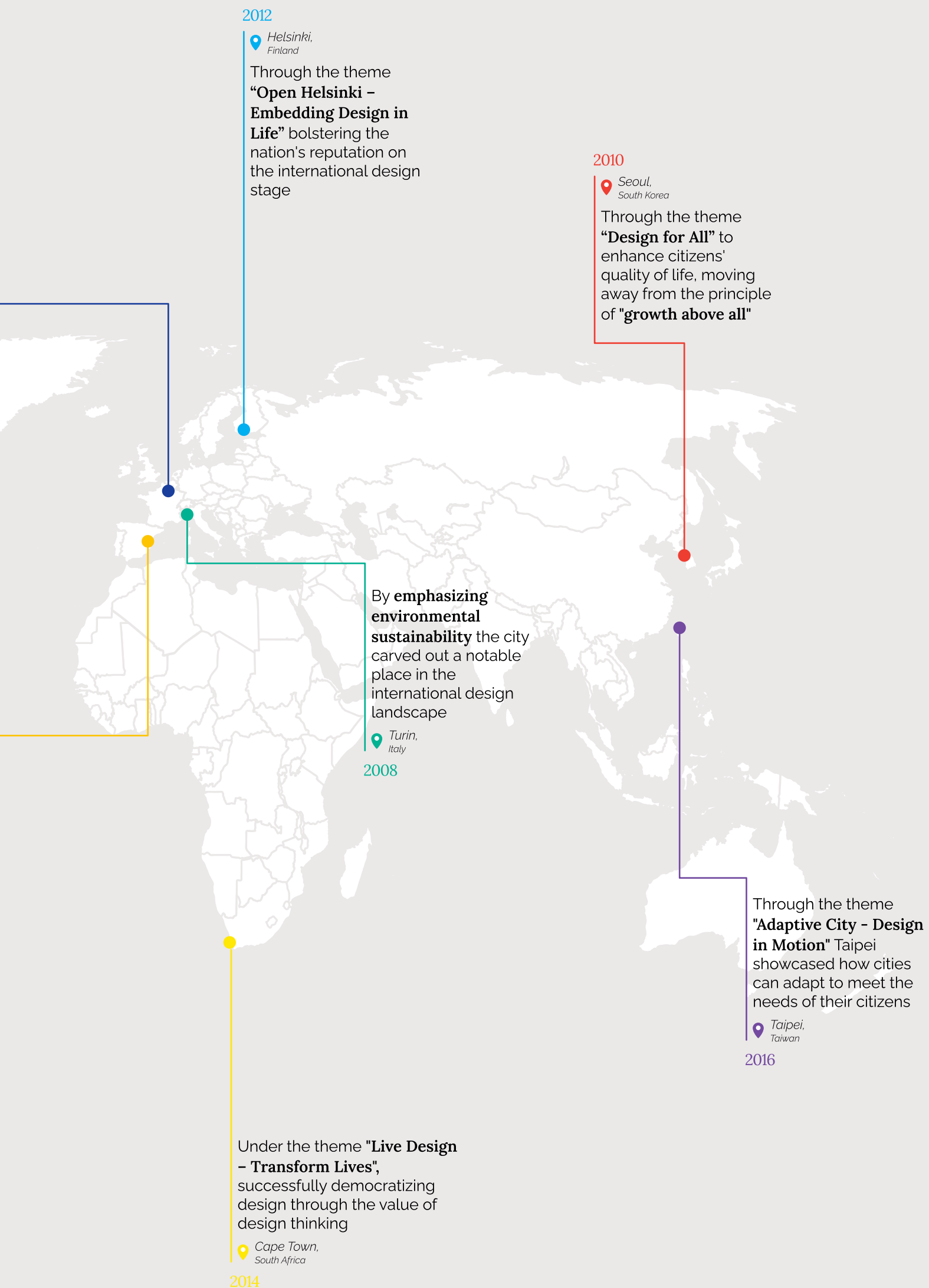
Mexico City,
Mexico

The primary objective was to cultivate a network of knowledge and exchange opportunities with a focus on "**Socially Responsible Design**".

They tackled six main themes: **health and wellness, design education, economy and innovation, heritage and identity, environmental sustainability, and equity, inclusion and diversity**

Valencia,
Spain

2022



Turin, Italy, became the inaugural World Design Capital in **2008**, marking a pivotal moment in global design. By emphasizing **environmental sustainability**, starting from its vibrant visual communication, the city carved out a notable place in the international design landscape. This journey involved **collaboration** between Turin's local businesses and 80 distinguished designers from across the globe.¹⁷ The designation as World Design Capital not only attracted significant investments to the city but also elevated its profile while fostering an **innovative public-private urban network model**.¹⁶

The second city to be designated as the World Design Capital in **2010** was **Seoul**, South Korea, which initiated an **architectural revolution** through the theme "**Design for All**" to enhance citizens' quality of life, moving away from the principle of "**growth above all**".¹⁸ Numerous interventions increased the city's **brand value** and led to the creation of the **Dongdaemun Design Plaza (DDP)**, designed in 2009 by architect Zaha Hadid.¹⁹ The DDP has become a significant **landmark** for **urban development** in South Korea.¹⁶

In **2012**, the title of World Design Capital was awarded to **Helsinki**, Finland, bolstering the nation's reputation on the international design stage through the theme "**Open Helsinki – Embedding Design in Life**". The event's outcomes were significant, as it led to the introduction of the city's first **Chief Design Officer**, which heightened public interest in design and integrated design principles into everyday processes.²⁰

Cape Town, South Africa, was designated the World Design Capital in **2014** under the theme "**Live Design – Transform Lives**", successfully democratizing design through the **value of design thinking**. The numerous co-design workshops, which involved citizens from various neighborhoods, were of significant importance.²¹



MAUTO (2008).
from World Design Capital Turin 2008



Design Fair (2010).
from World Design Capital Seoul 2010



Open Identity (2012).
from World Design Capital Helsinki 2012



International Design House Exhibition (2014).
from World Design Capital Cape Town 2014



International Design House Exhibition (2016).
from World Design Capital Taipei 2016

Taipei, Taiwan, was designated as the fifth World Design Capital in **2016**, with the theme "**Adaptive City - Design in Motion**". Through design-driven innovation, Taipei showcased how cities can adapt to meet the needs of their citizens, ultimately enhancing their quality of life.²² Designers from around the globe gathered to tackle urban challenges such as **space and resource limitations**, **rapid aging populations**, **slow economic growth**, **housing costs**, and the impacts of **extreme weather conditions**.²³



Opening ceremony (2018).
from World Design Capital Mexico City 2018

Mexico City, Mexico, took the stage as the World Design Capital in **2018**, with a focus on "**Socially Responsible Design**". The primary objective was to cultivate a **network of knowledge** and exchange **opportunities** aimed at enhancing the quality of life for its residents.²⁴

In **2020**, amidst the COVID-19 pandemic, **Lille Metropole**, France, comprising 95 municipalities, was honored with the title of World Design Capital. Embracing the theme "**Design is Capital**", the city showcased the **diversity and dynamism** of design projects within the region. To engage stakeholders across the territory, **Proof of Concept initiatives** were conceived by the community and further developed by design teams during workshops in collaboration with local businesses and organizations.²⁵



Maison Pocs (2020).
from World Design Capital Lille Metropole 2020

The last World Design Capital was **Valencia**, Spain. Their events happened after the pandemic, in **2022**. They tackled six main themes: **health and wellness**, **design education**, **economy and innovation**, **heritage and identity**, **environmental sustainability**, and **equity, inclusion, and diversity**,²⁶ through workshops and exhibits.

Valencia is currently rocking design in public policies, making a direct impact on industries and infrastructure.²⁷



World Design Policy Conference (2022).
from World Design Capital Valencia 2022

1.4

the 2024 choice

For the first time since 2008, the World Design Capital designation has been awarded to **two cities** within a single **binational region**: **San Diego** in the United States and **Tijuana** in Mexico. These cities, which were once part of the same country, Mexico, are now divided by a **barrier** formerly known as “**the line**”. Their **shared history** has created a **uniquely intertwined region** unlike any other in the world. ²⁸



The World Design Organization chose this region, located on the world's busiest border with over **150,000 pedestrians and vehicles** crossing daily,²⁹ as a model for **cross-border collaboration**. This selection highlights the region's tradition of using **human-centered design** to transform both natural and built environments.¹⁶

The ultimate goal of the WDC program is to elevate this region to a **model of seamless collaboration**.³⁰

As highlighted in the article "*Opinion: Here's why our region's World Capital Design title should get both sides of the border excited*" by Jorge Francisco Sánchez-Jofras and Diana G. Robinson Trápaga, both PhD candidates at CETYS University, this objective is encapsulated in the **acronym H.O.M.E.**:

- **"Human-centered"** in order for people's needs to be placed at the center of design,
- **"Open"** in order to be inclusive with newcomers and new ideas for the enhancement of the city,
- **"Multidisciplinary"** through shared engagement by the different sectors of the region, which is multicultural by definition.
- **"Experimental"** in the way of addressing today's complex challenges in the region by starting with the very fact that solutions must transcend traditional geographic boundaries and require the interconnectedness that our two cities have already shared throughout history.³⁰

The WDC program emphasizes themes of **justice, equity, diversity, inclusion**, aiming to ensure that everyone has the opportunity to thrive within their communities. Justice focuses on **removing barriers** to resources and opportunities, equity ensures **fair distribution of resources**, diversity is leveraged for **mutual benefits**, and inclusion fosters a **sense of belonging**.³¹

By addressing complex issues beyond physical borders, designers can tackle shared challenges and promote positive, sustainable social, economic, and environmental changes. This approach aims to **create synergies** around the commonalities between the two cities, establishing a **shared cultural and artistic platform**. The goal is to improve the lives of residents and those who commute between the cities for work or leisure.²⁸

The various events planned under the WDC program were held in both cities, with some in San Diego and others in Tijuana. This encouraged local participants and guests to cross the border and engage with both cities.³¹

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the border

2.1 A DEFINITION

2.2 AROUND THE WORLD

2.3 THE U.S.A.-MEXICO BORDER

2.4 AS DESIGN PRODUCT

2.5 THE SOUL OF THE BORDER

2.6 A DIRECT EXPERIENCE

2.1

a definition

In Italian, French, and German, the terms "**confine**" and "**frontiera**" are often used synonymously to indicate a geographical boundary. However, this analogy hides a significant historical and conceptual difference.

"**Confine**", derived from the Latin "cum-finis", meaning "**together at the end**," boundary indicates a sharp, static line **separating two contiguous spaces** belonging to the same or different **cultures** that recognize each other. It demarcates **land, city walls, provinces and geographical areas** controlled by neighboring political entities, rising to symbolize the known space, the known world.

A "**frontiera**", evokes a demarcation threshold between the **known and the unknown**, order and disorder, civilization and barbarism, the frontier is configured not as a static line, but as a geographical zone with **shifting edges**, an elastic territorial strip overlooking unknown territories. It represents the "**face-to-face**" between two cultures, two countries, **a place of confrontation** and encounter, proving to be more flexible and dynamic than the border, capable of shaping the everyday and generating complex dynamics.^{1 2}

A border is not merely a "boundary line", a simple demarcation between two states. A frontier is a complex and multifaceted symbol, capable of shaping the everyday and **generating complex dynamics**. The complexity of a frontier is to be found within the **multiple dimensions to which it belongs**:

1. **Physical dimension**, the most obvious, refers to the border as a territorial demarcation line;
2. **Historical dimension**, given by the events that have outlined its constituent features;
3. **Order and security dimension**, characterizing it as a line of defense against possible external threats, real or perceived;
4. **Psychological dimension**, taking on a more intimate dimension dependent on each person's experience.

The analysis of these dimensions will make it possible to grasp the complexity of the subject matter and **dissect the salient points**. However, before delving into such an analysis, it appears crucial to **first identify the existing boundaries** in the world today, and to understand how these boundaries **impact both geographically and sociologically**.

The everyday. (April 11, 2024).
made by the authors



2.2

around the world

In the era we are living in, characterized by the **internet, globalization, and the ability to reach anywhere with a computer or smartphone**, talking about borders seems almost contradictory. While the **virtual world** and the resulting knowledge and relationships, which flow from it, know no limits, **reality does**. The world and people have always been divided by culture, religion, and thoughts. And as much as we like to think that we have managed to break down these divisions today, this is not entirely true.

Subconsciously, when talking about walls around the world, one often refers to historical ones like the **Chinese Great Wall or the Berlin Wall**, or to walls on contentious borders like the one in the West Bank. The reality is that from the **15 barriers present on the planet in 1989**, the year of the fall of the Berlin Wall, today there are **more than 77**.³

The motivation driving men to continue identifying borders and building barriers is primarily the internal security of the territory, which can be disturbed by **cultural and/or religious reasons, drug trafficking, migration, health concerns, and the fight against terrorism**.

The boundaries can be mainly constituted by two types: those **natural identifiable** thanks to easily recognizable natural elements, or those **physical**, constituted by barriers raised by humans. Physical boundaries, in turn, can be divided into **historical boundaries, cultural boundaries, and contentious boundaries**.⁴

natural borders

The first natural borders to emerge were associated with elements of nature, such as **rivers, lakes, seas, oceans, mountains, forests, and deserts**. These borders were identified early on for **security reasons**: the first villages were built in strategic locations where the enemy could be easily seen, such as on high ground, or in areas that made it easier to procure food and water, such as near rivers, lakes, or the sea, which, besides **providing water, also offered fertile land and fishing opportunities**. This is probably one of the reasons why people designated natural elements as **boundaries between territories and, above all, the reason for fighting to conquer new territories**.

Important natural boundaries such as seas and oceans have been designated for **defining continents**. Indeed, it is worth noting that continents are geographically divided from each other by the sea or ocean, **except for the boundary between Europe and Asia**. In this case, the boundary follows the Ural Mountains in Russia, reaches the Caspian Sea, passes through the Caucasus and along the Black Sea, with the Atlantic Ocean to the west and the Mediterranean to the south. Continents, besides being a **geographical division**, possess a **strong cultural division stemming from the different development of civilization**, particularly in terms of religion. Additionally, Istanbul is an interesting case, being an important Turkish city located on the Euro-Asian border: the city is situated astride the two continents separated by the Bosphorus Strait.

Important natural boundaries can also be found **between states**, such as **mountains, forests, or deserts**. These boundaries often prove difficult to

cross due to the **extreme conditions** to which humans are subjected. However, when fleeing from war or critical political conditions, people are willing to risk everything.⁴

Several examples can illustrate the particular condition of natural borders. A notable case is the natural boundary between **Italy and its neighbors France, Switzerland and Austria**, represented by the mountain **range of the Alps**. Italy has always been a point of **reference for migrants** fleeing their lands, both from Africa and Eastern European countries. What happens is that migrants try to continue their journey to northern Europe and, in the absence of legal documents, their **only possibility is to cross the Alps**.⁵

A border with similar issues is the one between the **United States and Mexico**, which will be discussed specifically in the following pages. It presents a **significant immigration problem** for people coming from **South American countries such as Colombia and Venezuela**. The border is difficult to cross due to **both physical barriers that have been constructed and natural barriers**, including two deserts, the Chihuahuan Desert and the Sonoran Desert, as well as the wide bed of the Rio Grande River that separates the two states.

Lastly, a unique border is that of **Australia**. This state is an island surrounded by the sea, which makes it a **closely guarded territory**. Indeed, to enter this country, the options are either by sea or by air. Through Operation Sovereign Borders, Australia **controls the seas around it** and intercepts all means attempting to enter illegally.⁶

Ashley Gilbertson VII, *A young migrant boy looks across a bay in Italy*. (n.d.). from UNICEF



historical borders

In the world, there are physical borders, consisting of brick barriers, which can be defined as historical because they are **walls built by great empires** to define their territory and control security. These walls are recognized today as **great architectural achievements** and have become tourist attractions and **UNESCO heritage sites**.⁷

The first, or at least the most famous, between the historical walls is the Great Wall of China, designated as a **UNESCO World Heritage Site in 1987**. The walls that make it up were built starting from the 3rd century BC at the behest of **Emperor Qin Shi Huang** to prevent his army from retreating, then to control incoming and outgoing trade flows from the empire, and finally to **prevent invasions by other populations**.⁸

In Europe, the oldest historic walls are those that comprised the more than 5,000 kilometers of border fortifications of the **Roman Empire**, known as **the limes**. What remains today are approximately 550 kilometers of these fortifications, located in two sections **in Germany**. These walls were erected to establish economic and cultural boundaries. Among these ancient structures are **Hadrian's Wall and the Antonine Wall**, both of which have been designated as UNESCO World Heritage Sites—Hadrian's Wall since 1987 and the Antonine Wall since 2008. Hadrian's Wall, located in the United Kingdom and built by order of Emperor Hadrian around 122 AD, delimited the northern boundaries of the Roman Empire. Meanwhile, the Antonine Wall, **situated in Scotland** and constructed by order of Emperor Antoninus Pius in 142 AD, aimed to **defend the territories from the northern barbarians**.⁹

Among the historical walls, there are also those that have had great importance during the course of modern history, such as the **Berlin Wall** and the **Irish Peace Lines**.

The history of the **Berlin Wall** is one of the most unique because it divided the city and its inhabitants for 7 years. On the morning of August 13, 1961, indeed, Berliners **woke up to find themselves separated by a barrier initially constructed of barbed wire, later replaced by a brick wall**. The wall, which was meant to stop the population's exodus eastward,¹⁰ separated **East Berlin of the German Democratic Republic from West Berlin of the Federal Republic of Germany**. There were only three checkpoints, and people did not have the freedom to cross the wall at will. The wall, a **symbol of the Cold War**, was demolished on November 9, 1989. Today, parts of the wall remain as symbols of history that have been turned into **canvases for artists**.¹¹

If the Berlin Wall separated Germany due to the differing political ideologies of the people in power, the Irish Peace Lines were built to separate **Northern Ireland, Protestant, from Southern Ireland, Catholic**. The Peace Lines, built starting from 1969, were made of metal, cement, or barbed wire fences and equipped with gates that were closed at night. The first barriers were built in the **city of Belfast by Catholics** who sought to defend themselves, and later, they were **erected in various cities**.¹²

HUNG CHUNG CHIH, *The Great Wall of China*. (n.d.).
from *National Geographic*



physical borders

The boundaries mentioned in the previous paragraph are part of the macro-category of the physical borders, namely those **raised by humans**, it is known that after the fall of the Berlin Wall, these have increased, as anticipated in the introduction. **Each continent has its own walls, its own barriers**, and raises them in an attempt to feel safe, to protect itself, to stop the migration of people, and to filter them.

Physical borders can consist of only border crossings that materialize in customs through which it is possible to **control incoming flows into states**. They can also be combined with barriers in areas with a **higher influx**, where usually the barriers consist of metal fences or ditches. Lastly, fortified borders consist of **long stretches protected by physical barriers** and interrupted only by customs. ¹³

States erect walls mainly due to tensions, to **stop migration flows, and drug trafficking**.

problem of physical borders

Building walls or physical barriers to separate two states is **rarely the optimal solution** for halting migratory flows, combating terrorism, or resolving conflicts. **People always find ways to circumvent these walls**, sometimes **risking their lives in the process**. This is confirmed by the numbers of people attempting **to reach Europe from African states**, as well as those from Latin America seeking entry into the United States.

More than 269,900 people arrived in Europe in 2023, plagued by severe political instability and ongoing conflicts, such as those in the Middle East, North Africa, Sub-Saharan Africa, Central and South Asia. ¹⁴

Beyond endangering human lives, walls also **pose a threat to the ecosystem**, particularly to **plants and animals**. This happens because if people are not allowed to cross the border, neither can the **seasonal migratory flows of animals** crossing of the Sonoran and Chihuahuan Deserts mals, especially **large mammals**. ¹⁵

Ahmad Gharabli, A man walks along a road by Israel's controversial separation barrier between the occupied West Bank village of Nazlat Issa (left) and the Arab-Israeli town of Baqa al-Gharbiya (right) in northern Israel.. (n.d.). from Al Jazeera



The borders of the world

a man's invention

“Reliefs and waterways have a strong suggestive power, but they cannot rise to the dignity of borders except through a **solemn act of registration**, the only one capable of transforming a datum of nature into a rule of law.”

Régis Debray

Natural borders

Sonoran Desert

Chihuahuan Desert

Rio Grande River

Gibraltar Strait

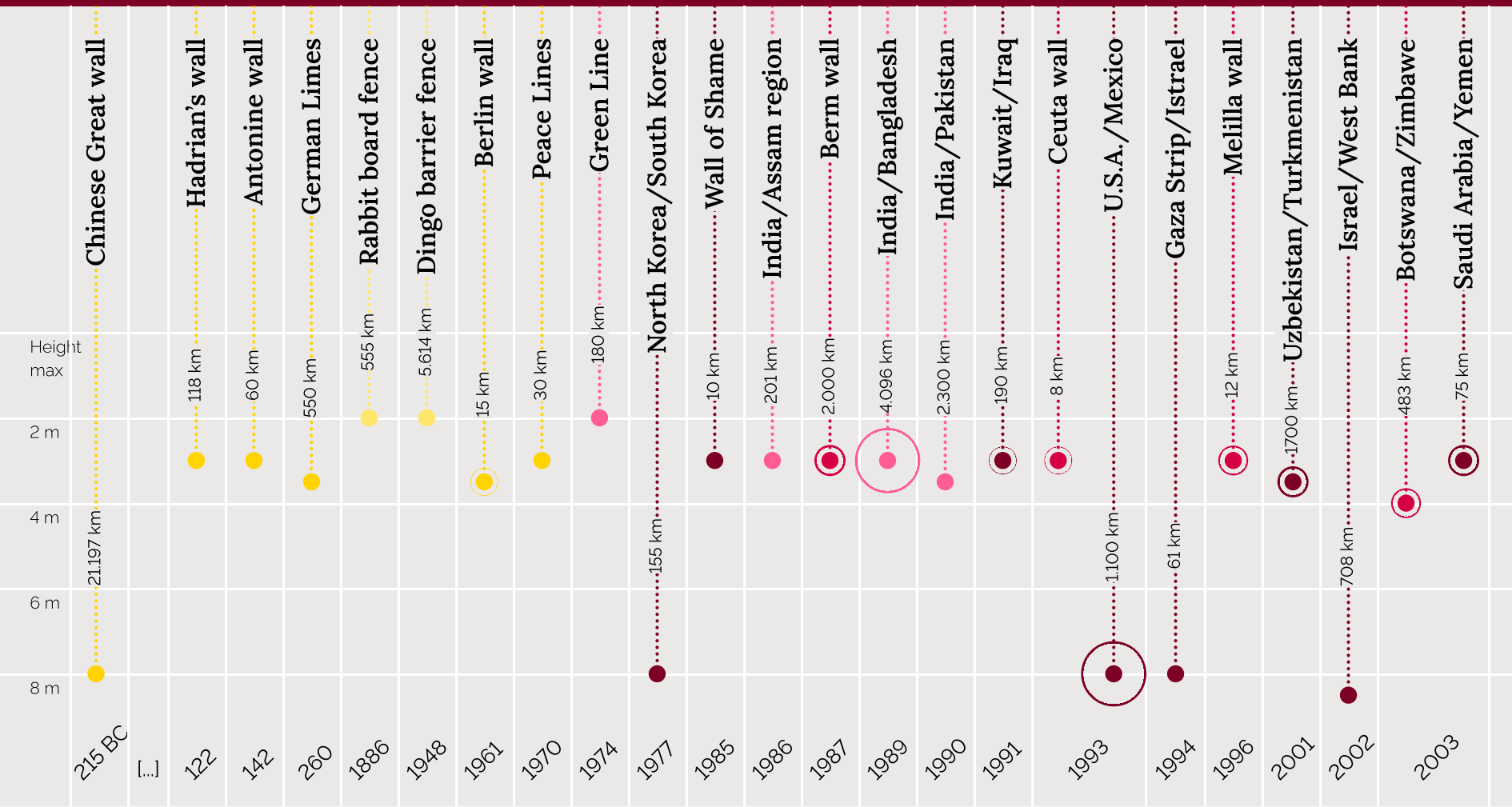
Sahara Desert

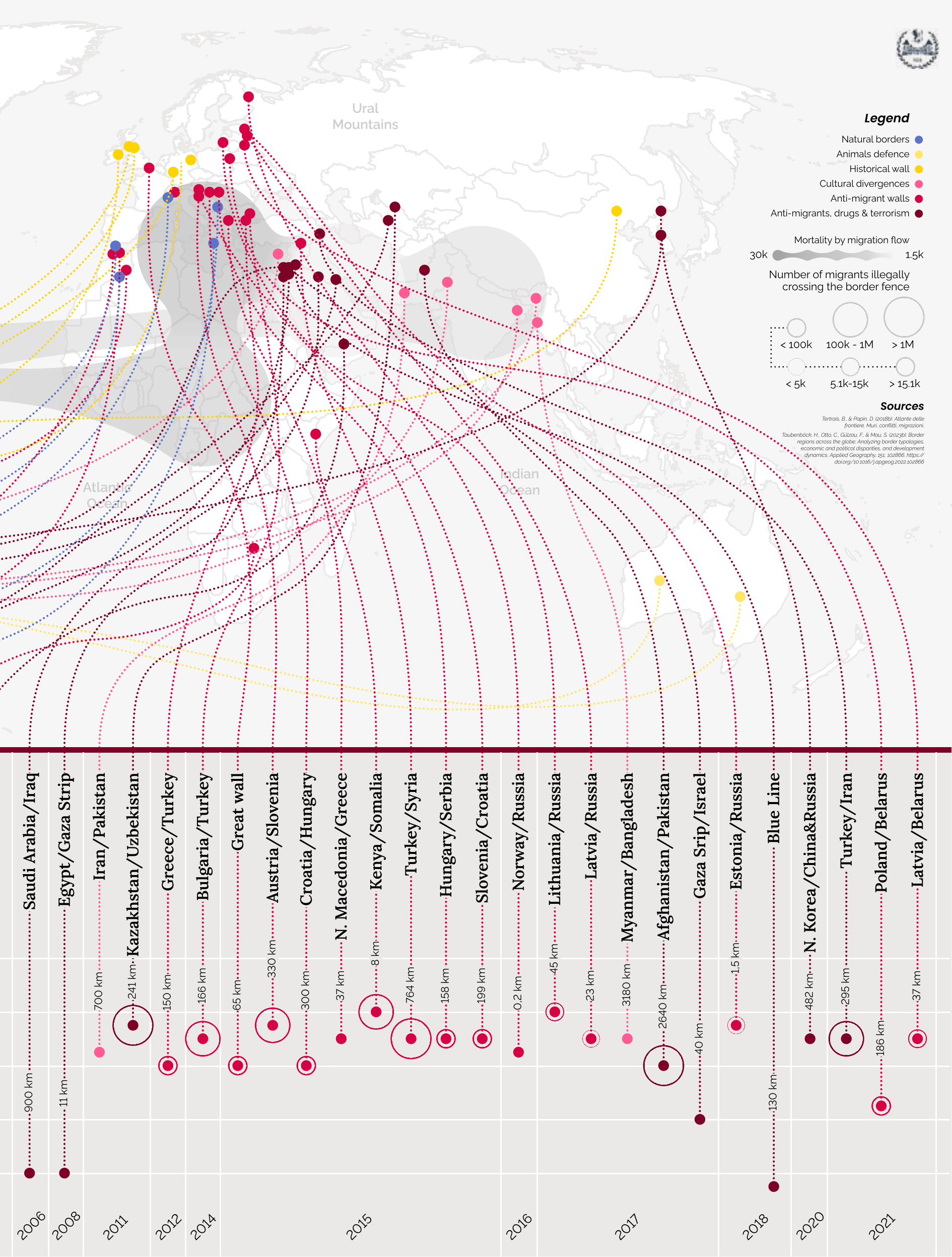
Alps Mountain range

Balkan Mountains

Mediterranean Sea

Physical borders





2006	Saudi Arabia/Iraq	900 km	
2008	Egypt/Gaza Strip	11 km	
2011	Iran/Pakistan	700 km	
2011	Kazakhstan/Uzbekistan	241 km	
2012	Greece/Turkey	150 km	
2014	Bulgaria/Turkey	166 km	
	Great wall	65 km	
	Austria/Slovenia	330 km	
	Croatia/Hungary	300 km	
	N. Macedonia/Greece	37 km	
2015	Kenya/Somalia	8 km	
	Turkey/Syria	764 km	
	Hungary/Serbia	158 km	
	Slovenia/Croatia	199 km	
2016	Norway/Russia	0.2 km	
	Lithuania/Russia	45 km	
	Latvia/Russia	23 km	
2017	Myanmar/Bangladesh	3180 km	
	Afghanistan/Pakistan	2640 km	
	Gaza Strip/Israel	40 km	
2018	Estonia/Russia	1.5 km	
	Blue Line	130 km	
2020	N. Korea/China&Russia	482 km	
	Turkey/Iran	295 km	
2021	Poland/Belarus	186 km	
	Latvia/Belarus	37 km	



The "Wall of Shame" in Lima separating rich and poor. (n.d.).
from Unequal Scenes

authors' note

In order to present the particular cases of physical barriers that have been erected in the world, along with their motivations, we decided to divide them by continent.

American borders

One of the most famous and discussed physical barriers in the world is located in North America and is the one that separates the USA from Mexico, which will be discussed specifically later on. Meanwhile, the physical barriers present in Latin America differ significantly.

These barriers **do not oppose between two states**, rather, they **divide the urban areas of the same city**, often separating the wealthy neighborhoods from the **poor ones with inadequate sanitation**, commonly referred to as favelas.

These barriers arise in major cities and physically materialize the **great gap between the wealth and poverty of the population**. They are supported by citizens to increase and **ensure security in the wealthier neighborhoods**.

Similar situations can be found in various South American cities, such as Lima or Rio de Janeiro. In 2009, the so-called "**eco-wall**" was built within the latter city with the aim of preserving the rainforest from the expansion of the favelas of Santa Marta. That way, the poorer section of the **population living in the interior felt strongly enclosed within the limits of this wall**.¹⁶

The "**Wall of Shame**" in Lima, Peru, dates back to 1985, a response to the mass migration from rural areas to cities during the 1980s. People began to settle unlawfully by building their homes near the wealthy neighborhoods where they worked during the day, forming the so-called "**pueblos jóvenes**" (*trans. young towns*).

Consequently, those living in the neighborhoods of **La Molina and Santiago de Surco**, with the permission of local governments, had a wall built around the neighborhoods of Pamplona Alta, San Juan de Miraflores, and Villa María del Triunfo. The wall, which has now reached a length of 10 km, has not only caused significant **problems of social inclusion** but also **disruptions in the movements** of those who live within it.¹⁷

European borders

Apart from **historical walls** that separated citizens of the same city due to ideological, religious, and political reasons, such as the Irish Peace Lines and the Berlin Wall, the remaining barriers that states continue to build are the so-called **anti-migrant walls**.

In Europe, there remains a single case of walls separating a state for reasons other than immigration, namely the **Green Line of Cyprus**, which separates the **northern part of the island**, under Turkish domination, from **the southern part**, under Greek control.

The Green Line of Cyprus, 180 km long and made of barbed wire and sandbags, has divided the city of **Nicosia since 1974** when the Turks invaded the island with the intention of preserving the minority Turkish population from **the coup** organized with the support of the Greek people.¹⁸

Since 2004, thanks to international agreements facilitated by the European Union, Cypriots have been able to cross the Green Line by showing documents, but **significant inequalities**, including **language differences**, prevent the two communities from unifying.¹⁹

Europe has always been a destination for **migratory flows** due to its proximity to Africa and its history of colonization. In fact, it is not new for **people to risk their lives both by land and by sea** to reach European countries.

The first anti-migrant walls were built in the **Spanish enclaves of Ceuta and Melilla** in Morocco in 1993. These two Spanish cities replace one of the land entry points for those who want to enter Europe, as well as departure ports for those attempting to cross the Mediterranean. For this reason, the **two cities have been surrounded by high metal fences, ranging from 5 to 6 meters**, which are often scaled by groups of migrants.⁴

With the **Syrian crisis** erupting in **2012**, migrant flows to Europe sharply increased, along with the willingness of **states to erect barriers**. The migrants are not only of Syrian origin but also come from the Middle East or states in West Africa, and the main routes consist of crossing the **Mediterranean Sea with landing points such as Spain, Italy, Malta, and Greece**, or **by land through Turkey and the Balkans** and passing through Belarus.²⁰

In response to the migrant flow through the Balkans, Eastern European countries started to **build physical anti-migrant barriers** starting from Greece and Bulgaria. Between 2012 and 2013, they began constructing barbed wire barriers, the first one being 150 km long and the second 200 km long, at the **border with Turkey**. In the years to come, many other states followed suit, and as of today, **Europe has around 2000 km of anti-migrant walls**.²¹

In Europe, there exists the unique case of the **Schengen Area**, where borders and customs are **exceptionally abolished** in order to **facilitate the dynamic movement** of people within the region's border control.

On June 14, 1985, in Schengen, Belgium, the agreement was signed which allowed for the **free movement of people without border controls**. Initially, this agreement was only concluded by five countries, namely Belgium, France, Germany, Luxembourg, and the Netherlands. However, starting from 1990, when the rules were refined to ensure the security of the signatory countries, other countries gradually joined, including Italy. As of today, the **signatory countries are the 22 EU members and four associated countries**, namely Iceland, Liechtenstein, Norway, and Switzerland.

Therefore, the pact allows people from the countries that are part of the Schengen Area to **move freely among participating countries**. Consequently, borders and customs between these countries have been abolished, though there has been an **enhancement in cooperation among state police and border controls** within the Area. Conversely, citizens from non-Schengen countries must obtain a visa to travel within the Area.²²

African borders

Even within the African continent, discussions of **anti-immigration walls** have emerged, aimed at countering **internal migrations within the continent**. Apart from the previously mentioned cases of Spanish enclaves, the physical barriers constructed in Africa are intended to deter migratory movements from **states experiencing internal conflicts or political instability**.⁴

In the northwest of the continent, in Morocco, the so-called **Sand Walls** have been erected, over 2000 km of fortifications consisting of sand, rock, and observation towers that separate **Morocco from Western Sahara**. The walls, which also employ about two-thirds of the army, were erected in defense of the area occupied by the Polisario Front.⁴

Moving to the vicinity of the Horn of Africa, in 2014, the Kenyan government built a **barbed wire barrier** on the border with **Somalia to stop the flow of migrants** from that country.²³

Lastly, there's the case of the 500 km **electrified barbed wire barrier** built in 2003 by the state of Botswana on the border with **Zimbabwe**. Although the official reason for the construction of this barrier was to limit the damage caused by the **epidemic of foot-and-mouth** disease that had affected Zimbabwe's **livestock**, Botswana was accused of actually erecting the barrier to stop the **migratory flow from the neighboring state**.²⁴

Asian borders

The Asian continent has seen the **highest number of physical barriers** erected between states, likely attributed to tensions among its diverse nations and its vast geographical expanse.²¹

Among the world's most famous physical barriers is the one that divides **North Korea from South Korea**. Following the Korean War, which concluded in 1953, the **Demilitarized Zone (DMZ)** was established along the 38th parallel, spanning approximately 250 km. This zone is the most natural area in all of Asia, as it is the least developed, with the exception of the **village of Panmunjom**, known as the Truce Village.²⁵

In this case, two distinct walls with different purposes define this border. South Korea, with support from the American government, constructed a **cement wall along the length of the Demilitarized Zone**, standing between 5 and 8 meters tall. Additionally, the wall features control towers, weapon depots, and gun ports. The primary purpose of the wall is **defense**; indeed, it serves as the first line of defense in the event of another **attack from North Korea**.²⁶

Conversely, the physical barrier constructed by North Korea near the Demilitarized Zone consists of **electrified barbed wire**. In this particular, perhaps unique, case, as with the barriers built on the borders with **China and Russia** in 2003 and 2020 respectively, the purpose of the barrier is to **prevent defectors from fleeing the country**.²⁷

The issue of the physical **barrier between India and Bangladesh** dates back to 1947, the year of the independence of the **British colonies**. The partition of the territories, overseen by British lawyer Sir Cyril Radcliffe, saw the division of the **Bengal and Punjab** regions based on cultural and religious grounds. At that time, Pakistan and Bangladesh, the latter becoming independent from Pakistan in 1971, were mostly populated by **Muslims**, while India was populated by **Hindus and Sikhs**, leading to forced migration between states.

In 1985, India initiated a **separation barrier** on the border with Bangladesh to **halt the influx of migrants**. This barrier, stretching over 1000 km, varies in form and material along the border, presenting physical barriers that are difficult to overcome.²⁸

To combat the **illegal drug trade** from Asia to Europe, **Iran erected a barrier** on the border with **Pakistan**. Consisting of earth and stone reinforced with ditches and barbed wire, the barrier spans 700 km.²⁹

Lastly, let's turn to the barriers erected in the **Middle East** along the borders of the so-called **hot states** and the current situation.

Israel has erected several walls around the state to ensure internal security and deter terrorists, including walls along the borders with the **West Bank, Lebanon, and Syria**, as well as the one in the **Gaza Strip** and along the border with **Egypt**. The borders of this state are continuously evolving due to the various wars undertaken over the years.³⁰ Today, more than ever, in light of the ongoing conflict, it is of vital importance to shed light on the **fault line between Israel and Palestine**.

The Israeli-Palestinian issue dates back nearly a century. On **October 31, 1917**, during World War I, Great Britain took control of the territory from the **Ottoman Empire**. In the following years, influenced by the anti-Semitic climate in Europe, there was a significant **Jewish migration to Palestine**, lasting until 1946.³¹

To address the existing tensions, the **United Nations adopted Resolution 181** in 1947, which proposed the partition of **Palestine into an Arab state and a Jewish state**, effectively granting about 55% of Palestinian territory to the Jews. **Jerusalem**, however, was immediately declared an **international territory** separate from the two states.³¹

In 1948, an event that would radically alter relations between the two states occurred: **the Nakba** (*trans. "catastrophe"*), during which more than **750,000 Palestinians were ethnically cleansed** from their homes by **Zionist militias**.³¹

Despite various international efforts to ease tensions, most notably the **Oslo Accords** signed between 1993 and 1995, the increasing **Israeli settlements**, the illegal **occupation of territory**, and the construction of a **wall along the Israeli-Palestinian border** are among the primary causes of the ongoing conflict.³¹

The separation wall, constructed in 2002 with the stated aim of **protecting against possible terrorist attacks**, has effectively divided Palestinian communities, thereby fueling anger among groups such as Hamas. Additionally, the wall has led to the establishment of a **complex system of controls** over Palestinians in the West Bank, limiting their right to freedom of movement, undermining their **means of subsistence**, and **increasing dependence on humanitarian aid**.³²

Palestinians, however, have denounced the wall as an Israeli means of **annexing Palestinian territory** because it is built in the West Bank and not along the 1967 Green Line. The International Court of Justice, although in a non-binding decision, ruled that the **wall violates international law**, demanding its dismantling and ordering Israel to pay reparations for the damage caused.³³ Ten years after what the UN defined, Israel has **still not implemented** any of the required measures.

The situation has garnered renewed attention following the terrorist attacks of October 7, 2023. When **Hamas militants** succeeded in breaking through the **"Iron Wall"** that divides the Gaza Strip from Israel, **undermining the IDF security system**.³⁴ Since that day, the conflict has escalated, drawing **international focus to the ongoing tensions** and prompting renewed discussions on **security, territorial boundaries, and humanitarian** concerns in the region.

Oceania borders

The **Australian physical barriers** serve a different purpose compared to other parts of the world. While in the rest of the world physical barriers are erected to monitor or block the flow of people and goods entering, in Australia the **main purpose of these is to block animals to preserve crops and sheep farming**.

The Darling Downs-Moreton Rabbit Board Fence was erected in 1886 and to date spans a length of 555 km. It is a **metal barrier** interspersed with **wooden posts** and **patrolled by DDMRB agents** aimed at preserving crops from rabbits, which infested the Queensland region starting around 1880 and are currently illegal.³⁵

To this barrier, a second one is added, the **Wild Dog Barrier Fence**, with a length of 5614 km, making it the longest physical barrier in the world. Located in the heart of Australia, it separates the **desert part from the fertile one** in the southeast of the country. The barrier was built in the post-war period starting from 1945 when agricultural activity and sheep farming intensified. The barrier consists of a 1.7 m high metal mesh **interspersed with crossing gates**, aimed at keeping dingoes, members of the **canine family that live in desert areas**, away. Baits are strategically placed along the barrier to attract dingoes and prevent them from traversing it in search of an opening.³⁶

2.3

the U.S.A.–Mexico border

After providing an overview of the current situation regarding the natural, historical, and physical barriers that separate various states globally, the focus now shifts to **the central theme of this thesis**: the border between the United States and Mexico.

The **United States of America**, a **federal republic** comprising **50 states**, lies to the north of this border, while **Mexico**, a **representative democracy** with **32 federal entities**, lies to the south.

The morphology of the **United States-Mexico border** is highly diverse. Extending from the **Pacific Ocean** in the west to the **Gulf of Mexico** in the east, the border traverses a variety of landscapes. To the north are the U.S. states of **California, Arizona, New Mexico, and Texas**, while to the south are the Mexican states of **Baja California, Sonora, Chihuahua, Coahuila, Nuevo León, and Tamaulipas**.

The border alternates between arid deserts, river plains, and rugged mountains. Starting from the west, the terrain is **predominantly mountainous**, except for a small part located in the area between San Diego and Tijuana where the Tijuana River flows, and the **Tijuana River Estuary Natural Reserve** is present. ³⁷

Moving eastward, to the north, the **border encounters the green area** of the Cleveland National Forest before reaching the desert areas of the **Sonoran Desert and the Chihuahuan Desert** interspersed with the Coronado National Forest. The easternmost part of the border is characterized by the fertile **lands along the Rio Grande**. ³⁸

the routes of migrants

As mentioned earlier, walls erected to protect a state are not entirely impassable. In the case of the wall built by the **United States to block the influx of migrants from South American countries**, those attempting **illegal entry** often prefer sections where **natural barriers**, rather than the wall itself, pose the primary challenge.

Migrants seeking to cross the border come from various states, so their routes can be long and arduous, often **involving passage** through multiple states before reaching the border between Mexico and the United States. The **chosen routes for crossing the border** are the **Sonoran Desert** and the **Chihuahuan Desert** because there are **fewer controls** due to the difficult conditions. These are also the points where the **highest number of migrants lose their lives**.³⁹

Additionally, a third and very dangerous crossing point is the **Rio Grande in Texas**. The treacherous conditions of the river add to the peril faced by migrants attempting to enter the United States this way.⁴⁰



Ash Ponders, *Migrants walk along the U.S. border wall in Arizona's Organ Pipe National Monument*. (Dec. 13, 2023).
from Wall Street Journal

not only people

As previously discussed regarding global physical barriers, the wall constructed between the United States and Mexico presents **multiple challenges**, notably in terms of environmental impact. The establishment of **physical barriers significantly threatens** the biodiversity within the affected regions.

This issue partly stems from the enactment of the **Real ID Act** by the U.S. Congress in 2005, which endows the **Department of Homeland Security (DHS)** with the authority to waive any legislation that might impede wall construction. This legislative provision allows for the construction of the barrier without **comprehensive environmental impact assessments**.⁴¹

The U.S.-Mexico border area boasts a **rich biodiversity**, encompassing ecosystems from desert scrublands to **freshwater wetlands and salt marshes**, which have been fragmented by the wall's construction. This fragmentation has led to the **degradation of natural vegetation, soil erosion**, modifications to **fire regimes**, and **alterations to hydrological processes**, which can result in **flooding**.⁴¹

The repercussions of the barrier, along with associated infrastructure such as **lighting and roads**, also extend to the fauna inhabiting the border region. **Animals are compelled** to vacate their habitats due to **artificial lighting and anthropogenic noise**, disrupting and fragmenting their natural environments and pushing some **vulnerable species towards extinction**.⁴¹

Besides habitat disruption, the barrier significantly interferes with the natural life cycles of animals, particularly those **dependent on migration**. Species at risk of extinction along the border include the **bighorn sheep**, the **Mexican gray wolf**, the **Sonoran pronghorn**, the **Quino checkerspot butterfly**, and the **ferruginous pygmy owl**. The latter two species, which fly at low altitudes, may be especially hindered by the wall's height.⁴¹

2.4

as design product

Nowadays, the delineation of boundaries by **physical walls is increasingly rare**. While the term "wall" is frequently misused to denote a physical boundary, its true definition pertains to any form of **demarcation by a barrier**. Originally, walls served the purpose of territorial demarcation, as evidenced by **historical examples** like the Great Wall of China and Hadrian's Wall, initially erected for territorial demarcation before being repurposed **for defense against invasions**. ^{4 42}

Barriers can be of different types: natural barriers, virtual barriers, and physical barriers. **Natural barriers** encompass features of the landscape, such as rivers, lakes, seas, oceans, mountains, and deserts, which have historically been employed by humans to delineate territories. **Virtual barriers** are formed by highly advanced surveillance that utilizes technological devices such as sensors, drones, and satellites. Often, these technological tools are integrated with physical barriers. Conversely, **physical barriers** manifest in **diverse forms**, ranging from simple fences, barbed wire barriers, metal fences, to **brick or reinforced concrete walls**. These solutions are frequently combined to **strengthen the barrier**, with additional surveillance facilitated by **cameras, drones, soldiers, and dogs**.

how to shape a barrier

Analyzing the wall as a product of **architects' and engineers' design**, it is possible to imagine the **design process** behind it. Barriers, being a product that must fulfill very specific tasks, are typically **designed with a form-follows-function approach**, prioritizing utility over aesthetics. ⁴³

The essential requirements that a **barrier must satisfy** are varied, and mainly include:

- **Visibility:** The barrier must be visible through physical barriers and signage indicating its presence so that it can be perceived.
- **Filtering function:** It must serve the function of filtering people so that they are not blocked but controlled and allowed to pass through.
- **Illegal inviolability:** The dimensions of the barrier must be such as to prevent easy circumvention, and the texture and material must be chosen specifically to prevent illegal crossing.
- **Resistance:** The wall must be resistant to climbing, cutting, tunneling, and impact.
- **Control:** The wall must be easily controllable, preferably by presenting transparency in its texture.

These requirements serve as **guidelines throughout the design process**, ensuring the barrier's effectiveness in its purpose of security and control. ⁴³

Over time, many architects and designers have **proposed alternative uses of walls** to address the needs arising from the border lines, which are more **closely related to the social and environmental problems that the barrier creates**.

needs	requirements
Visibility	Physical barrier
	Cartel
Filter	Custom
Impassable	Dimension (Height & Width)
	Texture
	Material
Strength	Climbing
	Cutting
	Tunneling
	Impact
Controllable	Visual permeability
	Texture

Design of the year 2020, vincono le altalene al confine tra usa e messico. (2020). from MasterX





U.S.A. - Mexico

The border between the United States and Mexico is characterized by a **diverse range of natural and physical barriers**, each with varying designs and purposes.

The main **natural barriers** encountered, starting from the east and moving westward, include the **Sonoran Desert**, located between **California and Arizona**, the **Chihuahuan Desert** in New Mexico, and finally, the **Rio Grande River**, which runs along much of the **border in Texas**, all the way to its mouth.

Along the rest of the border, which corresponds to approximately 1126 km, **physical barriers** are situated. These barriers consist of various types, ranging from **cement pillars** and **fences with barbed wire** to levees along the Rio Grande River and **virtual walls**.⁴²

The physical barriers were constructed starting from the year **1993**, under the administration of **President George H. W. Bush**, and have been continued over the years by the successive administrations of other presidents.

Among the primary barriers, placed directly on the **international border line with Mexico**, there are:

- The **Bollard Fence** is composed of reinforced concrete pillars and metal spheres, which, being implanted in the ground at small intervals, are very difficult to climb over or to bypass through tunnels.
- The **Landing Mat Fencing**, on the other hand, is a barrier composed of panels of carbon steel, used by the American military during the Vietnam War for constructing aircraft landing strips, and steel poles implanted deeply in the ground.
- The **Picket fencing**, instead, consists of closely spaced metal poles.
- The **Sandia Secondary Fence** is an example of secondary barriers, the ones that are located a few meters away from the primary barriers, primarily to prevent the passage of people.. This barrier consists of a vertical part and a sloping part at the end to prevent people from climbing over.

Vehicle barriers, designed to block vehicles from crossing the border, can be **temporary or permanent** and are designed to prevent vehicles from crossing the border. Temporary barriers are made of welded metal parts, they are not very tall, and can be moved as needed using a forklift. Permanent barriers consist of **metal poles of different heights** to prevent the construction of ramps to cross them, and a concrete base implanted in the underlying ground. The poles are arranged to allow people and animals to cross the border.³⁸

Additionally, the border is patrolled by the **United States Border Patrol**, which is tasked with monitoring the border and filtering the flow of people entering and exiting through the various customs stations along the border.⁴⁴

San Diego - Tijuana

Analyzing specifically the stretch of border subject to our thesis, namely, that **between San Diego and Tijuana**, it is not separated by natural barriers. For this reason, a physical barrier has been constructed to block and filter the large influx of people entering the United States.

The history of this physical barrier began in **1990** with a primary steel barrier approximately 3 meters high placed on the border line with Mexico, which over the years has been **replaced and improved**.³⁸ Additionally, a secondary barrier known as the **Sandia Fence** was erected to further block access.

From the outset, various methods have been employed to patrol this stretch of the border. These measures include: **USBP agents, seismic sensors, a fleet of vehicles, agents equipped with night vision goggles, permanent lighting, and a fleet of helicopters.**

The barrier was recently renovated during the **Trump presidency**. In fact, Donald Trump had based his campaign for the **2016 presidential election** on the promise of building a wall between the **U.S. and Mexico**. This promise was not entirely fulfilled, as the actual additional kilometers compared to those already existing are few, but he did reconstruct and reinforce a large portion of the existing barrier.⁴⁵

For the renovation of the primary barrier, placed on the border line, eight prototypes were designed, with heights ranging from **5 to 10 meters**. The prototypes were designed to meet the requirements set by the **CBP**, requirements that correspond to those listed.

The prototypes were made of **concrete, reinforced concrete, steel**, and other similar materials with high impact resistance characteristics, and they were subsequently tested using various techniques.⁴⁶

While aesthetics were not a priority, they were introduced as a requirement during the construction of the new wall. The wall needed to be visually appealing from the U.S. perspective. Inspired by artist **Ana Teresa Fernandez**, who painted sections of the wall the same color as the sky to blend it in, the prototypes featured one side with a color reminiscent of the desert.⁴³

Numerous artists have engaged with the wall from the Tijuana side and other sections, using art to challenge its presence. Ana Teresa Fernandez, for example, who with her work **"Borrando la Frontera,"** has sought precisely to make the wall disappear from the beach of Tijuana.⁴⁷

The San Diego-Tijuana border stretch exemplifies the **complexities and challenges associated with border security and physical barriers**. From its initial construction to recent renovations and artistic responses, this border segment highlights the ongoing dialogue between **security measures and human creativity in addressing socio-political issues**.

Alejandra Vallejo Fa Visita Al Marito Daniel Armendariz Davanti Al Muro Di Confine, Nei Pressi Del Parco Dell'amicizia Di Tijuana. (May 15, 2016). from Global Voices



2.5

the soul of the border

3140 are the miles of border separating the United States and Mexico, **two states, one territory**, divided by a treaty, the **Treaty of Guadalupe-Hidalgo of 1848**. This treaty ended a two-year war and resulted in Mexico losing nearly 2 million square kilometers, half of its territory at the time. ^{48 49 50}

Although numerical data, such as border length, may seem aseptic and may not fully capture the geopolitical dynamics, understanding these numbers is essential to grasping the complexity of the phenomenon.

With its **125,000 thousand daily crossings**, the San Ysidro port of entry, it **ranks among the world's busiest borders**. ⁵¹ People cross for different reasons, not only occasionally for tourism, but also and especially on a daily basis **for work, school, shopping, medical care, or to visit friends and relatives**. ^{50 52 53 54}

This makes this border not only socially significant but also environmentally impactful. The heavy traffic of people, vehicles and goods flow across the border due to international agreements like **NAFTA**, generating **\$45 billion in annual cross-border trade**. ⁵⁵ This traffic contributes significantly to emissions due to the waiting time for cars and vans at the border. ⁵⁶

*Al Confine Fra Messico E USA. (n.d.).
from Vie di Fuga*



“ To live in the Borderlands means you
are neither hispana india negra española
ni gabacha, eres mestiza, mulata, half-breed
caught in the crossfire between camps
while carrying all five races on your back
not knowing which side to turn to, run from;

To live in the Borderlands means knowing
that the india in you, betrayed for 500 years,
is no longer speaking to you,
that mexicanas call you rajetas,
that denying the Anglo inside you
is as bad as having denied the Indian or Black;

Cuando vives en la frontera
people walk through you, the wind steals your voice,
you're a burra, buey, scapegoat,
forerunner of a new race,
half and half--both woman and man, neither--
a new gender;

To live in the Borderlands means to
put chile in the borscht.
eat whole wheat tortillas,
speak 'Tex-Mex with a Brooklyn accent;
be stopped by la migra at the border checkpoints;

Living in the Borderlands means you fight hard to
resist the gold elixir beckoning from the bottle,
the pull of the gun barrel,
the rope crushing the hollow of your throat:

In the Borderlands
you are the battleground
where enemies are kin to each other;
you are at home, a stranger,
the border disputes have been settled
the volley of shots have shattered the truce
you are wounded, lost in action
dead, fighting back;

...

• • • To live in the Borderlands means
the mill with the razor white teeth wants to shred off
your olive-red skin, crush out the kernel, your heart
pound you pinch you roll you out
smelling like white bread but dead;

To survive the Borderlands
you must live sin fronteras
be a crossroads. ”

Gloria Anzaldúa

A cultural issue

“ Hay tantísimas fronteras
que dividen a la gente,
pero por cada frontera
existe también un puente.”⁵⁷

(trans. "There are so many borders
that divide people,
but for every border
there is also a bridge.")

The **San Diego-Tijuana border** has always embodied a dual nature: it is **both a barrier and a bridge**. This **duality stems from the shared history and experiences** between the two cities, as will be explored in the next chapter, which delves into the historical context of the border.

However, “*Much more needs to be learned about the San Diego-Tijuana Border: The U.S-Mexico Border is the front line where the impacts of globalization and human migration collide along the geo-political fault line of the industrialized and developing world, and nowhere else on earth are the contrasts and contradictions of the two worlds so great as on the San Diego-Tijuana Border. In this sense, the San Diego-Tijuana border region is a living laboratory for research on issues of urban poverty, migrant health and education, and class and socio-economic differences arising from growing levels of economic disparity.*”⁵⁸

Consequently, it is possible to say that the wall separating the United States from Mexico is not only a **physical barrier**, but also, and more importantly, **a mental one**. It not only divides two countries and continents, but also **two distinct societies and ideologies of life**. It distinguishes the privileged from the disadvantaged and the rulers from the ruled.⁵⁹ The peculiarity, as will be observed below, however, lies in the presence of **a real border culture, a "third country"**.⁵⁷

The **historical trajectories** of the two nations, to which the two cities belong, have created significant cultural and social disparities, which go beyond similarities and agreements to improve the quality of life on the border. San Diego, influenced by **Protestantism and U.S. laws**, developed a distinct culture compared to Tijuana, which maintained strong **Mexican traditions**.⁵⁰

Despite these differences, the two cities became strongly interdependent, cooperating in **border management and trade**, and forming a **unique cross-border community**. The ease of crossing the border allowed many people to **live binational lives**, working in one city and residing in the other. This generated a culture of resilience and adaptation. The local economies of the two cities became complementary: Tijuana provided affordable labor and services, while San Diego offered **higher-paying markets and job opportunities**.⁵⁰

This theme of interconnectedness will be further explored in the next chapter, which delves into the specific characteristics and differences between the two cities.

2.6

a direct experience



Mi primera vez. (March 9, 2024).
made by the authors

Since the **Schengen Area** exists in Europe, allowing European citizens to travel without crossing walls or **borders**, crossing "**The Line**" (as it is called by local people) between the United States and Mexico **was a new experience**.

The crossing was repeated twice at different times and on different days because there were two visits to the city of Tijuana. This made it possible to observe changes in the flow of people, as the first visit was **on a Sunday**, while the second visit was on a **Thursday, a weekday**. The crossing times were almost the same in the morning, with both visits reaching the crossing point by **10:00 AM**. However, the return times differed, with the return on Sunday occurring **in the evening** and the return on Thursday happening **in the afternoon**.

Reaching the border wall from San Diego is simple, as the **Blue Line trolley** connects the city's far ends (the **La Jolla neighborhood** with the San Ysidro neighborhood), arriving directly at the wall crossing point in **San Ysidro**. From the trolley's terminus, the city of Tijuana is already visible, as it is built right next to the wall. Upon disembarking from the trolley, it is necessary to exchange dollars for pesos, and then one starts to funnel through the corridor that crosses the wall. This corridor has reinforced concrete walls about **3 meters high**, topped with coils of barbed wire as one approaches the crossing point. Just before entering the crossing point, the wall separating the two cities opens to reveal **the word Mexico**.

The journey to enter Mexico is short and does not take much time. **Passports and identity cards** are checked almost on the fly, and unless required, no stamps are placed on the passports. The only moment of waiting is when bags, duffels, and suitcases are placed **inside scanners**. After passing the checks, the landscape changes; before exiting the crossing point, one must pass through another corridor.

The experience of swiftly crossing the border into Mexico parallels the description provided by **Chicana author Gloria Anzaldúa** in her semi-autobiographical work, *Borderlands / La Frontera: The New Mestiza*. As paraphrased in the article "Culture of the Border and Border of Culture: Between Mexico and the USA," this crossing feels nearly seamless, almost as if one were not traversing an international boundary at all.⁶⁰ Initially, the region appears continuous and unified. However, the contrast becomes evident immediately after passing through border controls, where the differences manifest in the presence of **taco stands, street vendors, and a line of taxis poised to transport both locals and tourists** throughout the city.

Inside the city of Tijuana, **the wall is not perceptible** because it is not visible when one is in the city center. It becomes visible if viewed from a tall building, such as during a visit to the **Norte Brewing brewpub**, where there is a floor-to-ceiling window overlooking the city, and beyond the view, one can see the wall on the green hill.

The presence of the wall is felt when traveling from **Tijuana to Playa de Tijuana**, as the highway runs entirely along the wall to the beach. On the beach, the **atmosphere** is relaxed, with **families enjoying a day in the sand and waves**. **The establishments along the seafront range from well-kept to dilapidated**. The wooden boardwalk features several stands selling sweets, tacos, and drinks until it reaches the wall. The wall extends into the sea for several meters, with its concrete base emerging from the sand. On the Mexican side, the beach is full of people, while looking through the wall's bars, one can see that on the U.S. side, the beach, being part of the Tijuana River Estuary Reserve, is deserted. The Mexican side of the wall features several murals that end where the beach ends.

Returning to the United States is not quick. Especially on weekends, the queue can be very long, while during **the week**, it is much more fluid. One must wait in long lines that can last up to 3 hours due to thorough **checks by U.S. Customs and Border Protection agents**. During the wait, there are various vendors selling churros, beggars asking for contributions, and singers performing Mexican songs.

To avoid the queue when returning to the United States, there are several options. One is to take **minibuses** that cross the wall, where **identity checks have already been carried out**, making the process faster. Another is to **pay children to wait in line for others**, allowing them to skip the queue.

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the mission

3.1 THE METHODOLOGY

3.2 SYSTEMIC DESIGN AT THE BORDER

3.3 POSTCOLONIAL STUDIES

3.4 A VISION

3.1

the methodology

Beginning in the 1960s, various publications started to highlight the challenges posed by industrial production and the widespread use of a linear economy. These issues remain prevalent even today. Among these influential works, *"The Limits to Growth"* commissioned by the Club of Rome in 1972, stands out. The report, which received extensive media coverage, underscored the critical impact of exponential population growth and human activities on the planet. Its introduction reflects the urgent warning issued by U Thant, the third Secretary-General of the United Nations:

“ I do not wish to seem overdramatic, [...] Members of the United Nations have perhaps ten years left in which to subordinate their ancient quarrels and launch a global partnership to curb the arms race, to improve the human environment, to defuse the population explosion, and to supply the required momentum to development efforts ”¹

The repercussions of this report were profound, prompting significant figures within the design community to reassess the role of the designer. It highlighted the influential capacity of designers to effect fundamental change from the outset of a project. Don Norman, in *"Design for a Better World: Meaningful, Sustainable"*, emphasizes this capacity:

“ Professional designers have the training and the knowledge to have a major impact on the lives of people and therefore on the earth ”²

Likewise, Victor Papanek, in his seminal work *"Design for the Real World"*, redefines the role of industrial designers in response to the transformative pressures resulting from the excesses of industrial production. Papanek observes:

“Often, more complex problems can be addressed only by teams of specialists. [...] Industrial designers frequently find that, besides fulfilling their normal design function, they must act as a communication bridge between other team members. Thus, the industrial designer in a team setting often becomes the 'team synthesist,' a position to which they have been elevated only by the default of people from other disciplines.”³

These perspectives underscore the evolving responsibilities of designers and their potential to drive systemic change through a holistic and integrative approach to design.

The radical shift in thinking addressed in this thesis necessitates a holistic, systemic approach. The objective is to metaphorically bridge San Diego and Tijuana, designated as World Design Capital 2024, by analyzing the dynamics at the U.S.-Mexico border using systemic design methodology.

The region is characterized by the juxtaposition of a developed and a developing country, marking the most traversed and heavily trafficked illegal border globally. Consequently, the problems that arise are complex, affecting both cities within the region.

This thesis addresses these challenges through a holistic approach, focusing primarily on environmental and social issues, while acknowledging their economic implications, which will not be explored in detail.

The methodology employed to address these challenges is systemic design. As articulated by physicist and systems theorist Fritjof Capra and biochemist Pier Luigi Lisi in *"The Systems View of Life: A Unifying Vision"*:

“When we look at the state of the world today, what is most evident is the fact that the major problems of our time – energy, the environment, climate change, food security, financial security – cannot be understood in isolation. They are systemic problems, meaning that they are all interconnected and interdependent.”⁴

systemic design

Systemic design, * which emerged in the early 20th century, aims to address **complex, interconnected problems** by managing flows of matter, energy, and information to develop **collaborative networks** among **diverse systems**. This **interdisciplinary approach**, integrating both **humanities and scientific disciplines**, enables a comprehensive and **holistic understanding of problems**.

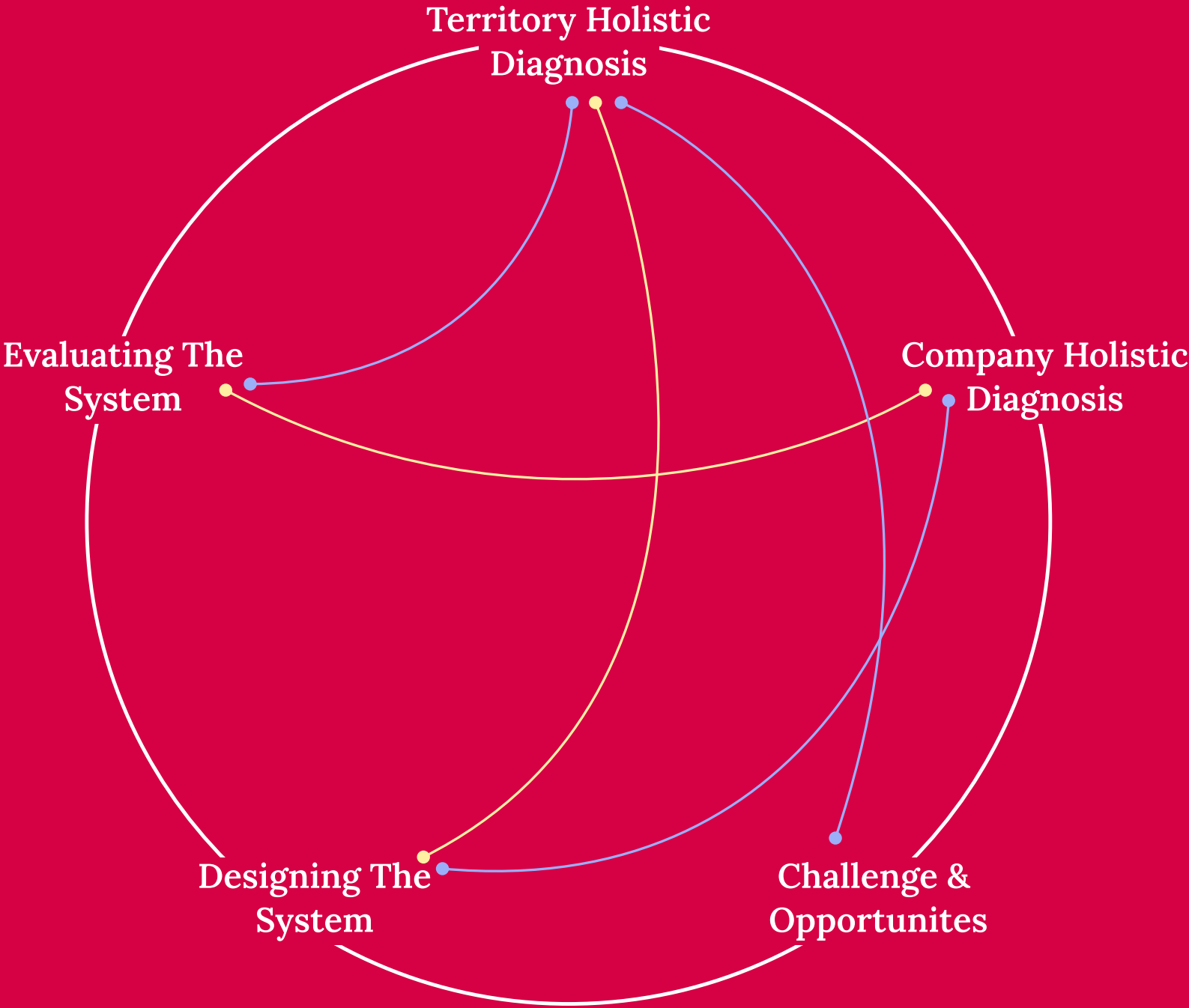
* The philosophy of systemic design is encapsulated in the phrase “**The whole is more than the sum of its parts.**”⁴

Systemic design is based on **five pillars** derived from systems theory, the study of nature, and ecology. These pillars, as outlined in *“The Systems View of Life: A Unifying Vision”*, are:

- **The relationships between the elements of a system** are essential because they generate the system itself. Indeed, the **actors** within a given **territory do not exist in isolation**; their interactions create **dynamics that confer identity upon the system**. Understanding and subsequently designing these relationships is crucial for creating systems that are effective and capable of adapting to contextual changes.
- The **outputs of one process become the inputs for another**, developing continuous flows of matter, energy, and information. This pillar is connected to the concept of a **circular economy**, where the elements composing the system must be designed to contribute to the system's overall functionality.
- **Autopoietic systems** maintain and **reproduce themselves by creating their own parts** while **co-evolving** with other systems. This concept, derived from biology and cybernetics, describes the ability of systems to **self-organize** and, through feedback cycles and adaptation, **evolve** in response to external challenges.
- **Act locally**, valuing the unique material, social, cultural, and economic resources of the considered territory.
- **Complex and interconnected problems** are viewed through the lens of society and human beings, understood as **part of a broader ecosystem**.⁴

These pillars are **reflected in the methodology adopted** in this thesis, which follows an **iterative, circular process**, in contrast to a linear one. This means that each step may require revisiting previous steps to achieve the best project definition. The methodology includes **an analysis phase** to define the current system, an **evaluation phase** to identify challenges and opportunities for **creating an updated, more efficient system**, and a final **evaluation phase** to define the project's development timelines and scalability.

It should be pointed out that **this methodology is flexible** and, in the thesis work, will be **readjusted to the needs of the context and project**.



3.2

systemic design at the border

This thesis applies systemic design to the **San Diego - Tijuana border region** with the aim of creating a **metaphorical bridge** connecting the two cities.

The structure of the thesis reflects **the systemic design methodology**. Once the region of interest and its boundaries, that is the San Diego - Tijuana area were defined, a **holistic analysis** was conducted. This analysis included examining the **environmental, social, and economic sectors** that characterize the region.

The **craft beer sector** emerged as a focal point for developing this metaphorical bridge. A comprehensive **analysis of the sector** was carried out, including an exploration of **current practices**. A specific company within this sector provided an in-depth understanding of the **production process**, including the **inputs and outputs** involved.

The research phase enabled the definition of the current system, which is based not on a single company but on the **relationships** that shape the **internal dynamics of the border region**.

From the territorial, sectoral, and brewery analyses within the region, **key challenges and opportunities** were identified, leading to potential avenues for action. For each identified challenge, **actionable opportunities** were highlighted. Through **qualitative evaluation**, the opportunities that best aligned with the initial objectives were selected.

This led to the **definition of a new system**. Despite the challenges encountered during research and project development, given the specific characteristics of the region, the new system adheres to the principles of systemic design. A **metaphorical bridge** was successfully conceptualized within the region by **leveraging the potential to establish a robust network** that connects the region through the craft beer sector.



*The writers. (April 11, 2024).
made by the authors*

3.3

postcolonial studies

In the methodological framework and for the analysis of border dynamics, it is essential to delve into postcolonial studies.

“ Sin dai primi anni Ottanta, il post-colonialismo ha sviluppato un corpus di scritti il cui obiettivo principale è cambiare i modi dominanti di pensare i rapporti tra mondo occidentale e non occidentale. ”⁵

(trans. "Since the early 1980s, post-colonialism has developed a body of writings with the primary objective of changing dominant ways of thinking about the relationships between the Western and non-Western worlds.")

In the context of this thesis, the inversion will consist of overturning the "traditional" perspective on the border, aiming at the

“ superamento del colonialismo e la persistenza della colonialità che regola sia le identità di sesso e genere, sia quelle razziali e politiche. ”⁶

(trans. "overcoming of colonialism and the persistence of coloniality, which regulates both gender and sexual identities as well as racial and political ones.")

However, to proceed as outlined, it is crucial to deeply understand the origins of these studies and, where possible, comprehend their operational modalities.

“ È fondamentale la femminista di origine indiana Gayatri Spivak a coniare, in *Europe and its Others* (1985), il concetto di «alterizzazione» (Othering) per comprendere il meccanismo mediante cui si stabilisce la superiorità del colonizzatore e, al contempo, l'inferiorità dei colonizzati. ”⁶

(trans. "It is fundamentally the Indian feminist Gayatri Spivak who, in *Europe and its Others* (1985), coined the concept of 'othering' to understand the mechanism by which the superiority of the colonizer is established and, simultaneously, the inferiority of the colonized.")

The context in which Spivak, an author and philosopher, operates is the 1980s, during which neoliberal policies altered productive systems, allowing companies to **relocate their productions** ⁷ to benefit from lower costs, albeit externalizing social and environmental costs.

As will be analyzed later in this thesis, this phenomenon closely resembles what occurred in the United States following NAFTA (1994), with the emergence of the "maquiladoras".

“ Infatti, la struttura produttiva messicana è storicamente intrecciata a quella degli Stati Uniti e buona parte degli imprenditori degli stati del nord – el norte – sono accesi fautori del consolidamento e dell'implementazione dei rapporti economici con gli Stati Uniti. ”⁸

(trans. "In fact, Mexico's manufacturing structure is historically intertwined with that of the United States, and much of the entrepreneurs in the northern states-el norte-are ardent advocates of consolidating and implementing economic relations with the United States.")

Therefore, the scenario is not much different from what Spivak observed, where the state with the greatest economic supremacy diversifies production, relocating what is possible to countries like Mexico, which offer low-cost labor, while keeping capital intensive enterprises with high skills in their own country. ⁸

“ Guardare la realtà dal punto di vista del Terzo Mondo significa osservare gli effetti negativi del capitalismo, prendere coscienza della logica dello sfruttamento che rende possibile l'accumulazione di ricchezze enormi da parte dell'Occidente. Ciò si percepisce ancora meglio se ci si mette dalla parte della donna, che essendo ritenuta subalterna è taciuta dalla società due volte: la prima volta dal capitalismo stesso, che non considera la vita familiare come produttrice di plusvalore; la seconda volta dalle culture di quei Paesi del Terzo Mondo che hanno vissuto per anni sotto il giogo europeo [...] senza poter sviluppare una propria identità, in cui gli uomini hanno giocato da padroni appropriandosi del ventre femminile come luogo di produzione. ”⁷

(trans. "To look at reality from the Third World perspective is to observe the negative effects of capitalism, to become aware of the logic of exploitation that makes possible the accumulation of enormous wealth by the West. This can be perceived even better if we get on the side of women, who being deemed subaltern are silenced by society twice: the first time by capitalism itself, which does not consider family life as a producer of surplus value; the second time by the cultures of those Third World countries that have lived for years under the European yoke [...] without being able to develop their own identity, in which men have played the master by appropriating the female womb as a place of production")



*Maquiladora. (n.d).
from Britannica*

Therefore, the “post” in the term **“postcolonialism”** should not be read in its temporal dimension. Following **Anibal Quijano**, the “post” reflects the concept that forms of colonization can persist long after formal colonization ends, manifesting through **dichotomies** such as **“dominated/dominant”** and **“center/periphery,”** as well as through **new forms of colonialism** linked to **implicit racism and patriarchy**. These factors explain why Latin American countries, despite their **economic performance**, fail to reach modernity.⁹

Such a framework of constructs is undoubtedly relevant in the context under analysis, the border cities of San Diego and Tijuana, separated by a wall that seeks to distinguish “us” from “them,” or as **Gloria Anzaldúa** would say in *“Borderlands/La Frontera: The New Mestiza”*:

*“The US-Mexican border es una herida abierta where the Third World grates against the first and bleeds. And before a scab forms it hemorrhages again, the lifeblood of two worlds merging to form a third country—a border culture. Borders are set up to define the places that are safe and unsafe, to distinguish us from them. A border is a dividing line, a narrow strip along a steep edge. A borderland is a vague and undetermined places created by the emotional residue of an unnatural boundary.”*¹⁰

From the very title of the book, the author anticipates a mixed communicative mode, with **the slash** separating the words “Borderlands” and “La Frontera” **symbolizing the demarcation line between the two states**, the border, intended to separate but also to connect the two languages and cultures.¹¹

In her writing, Anzaldúa brings to an **autobiographical and personal level the almost bidimensional confrontation of the border**, which is resolved in a new synthesis: that of “The New Mestiza.” The term **“Mestiza”** is borrowed, as she herself notes, from the Mexican philosopher **José Vasconcelos** to define a mixed race, the “mestizo”. *“This mixture of races, rather than resulting in an inferior being, provides hybrid progeny, a mutable, more malleable species with a rich gene pool.”*¹⁰

For Anzaldúa, from this **mixture of languages, cultures, and beliefs**, it is possible to discern *“a new mestiza consciousness, una conciencia de mujer: It is a consciousness of the Borderlands.”*¹⁰ The struggle of the mestiza is a **feminist struggle**, traveling within a continuous cultural compromise, transcending the logic of rational thought (the domain of the West), and turning towards a **divergent thought**, *“one that includes rather than excludes.”*¹⁰ Only this thought can save the world, because *“dominant white culture is killing us slowly with its ignorance.”*¹⁰

The spread of postcolonial theories in Latin America has reformulated some concepts but has also highlighted endemic concerns. In 1997, in a speech at the Latin American Studies Association congress in Guadalajara, academic **Antonio Cornejo Polar** opened the debate and critique of postcolonial theories, since they are **formulated only in English**, globalizing and generalizing what is unique to Latin America in terms of language and culture.⁹

*“Le teorie postcoloniali vengono infatti formulate ed enunciate nella lingua del primo mondo, nella lingua egemonica, direbbero in America Latina, attraverso quel canale di diffusione rappresentato dalle università nord-americane.”*⁹

(trans. “Postcolonial theories are indeed formulated and enunciated in the language of the first world, in the hegemonic language, they would say in Latin America, through that channel of diffusion represented by North American universities.”)

Such a view of postcolonial theories appears to be the main reason why many Latin American intellectuals **express some reticence towards postcolonial theory**.⁹ It should also be noted that this type of debate has been present in Latin America long before its emergence in the West. In 1891, scholar **José Martí**, in *Nuestra América*, already sided with mestizo identity, promoting an **American way of thinking that does not need to seek solutions in Europe**.¹²

3.4

a vision

The combination of the two theories outlined in the paragraph, **systemic thinking** on one hand and **postcolonial studies** on the other, provides the foundation upon which the **research and territorial analysis**, as well as the identification and implementation of the project, will be based. This **theoretical integration** allows us to address the complexity of the project with a **holistic vision**, considering not only the technical and functional aspects but also the **historical, social, and cultural dynamics** that influence the territory.

The methodological and theoretical framework provided by systemic design will represent the **operational basis** for the investigation, development, and evaluation of the project proposal. Systemic design, with its ability to analyze and integrate various elements into a coherent system, enables the development of **innovative and sustainable solutions**. This approach will be crucial for addressing the complex challenges associated with the creation of a **metaphorical bridge** between the cities of San Diego and Tijuana.

In addition, other methodologies inherent to the **multidisciplinary nature** of the subject will be incorporated, contributing to the advancement of the objective of constructing the bridge. Among these, a central role is given to **postcolonial theories**, which will aid in the territorial investigation as well as in the structuring and transmission of content. Postcolonial theories allow for a critical examination of **power dynamics, colonial legacies, and historical injustices**, offering a deeper understanding of the social and cultural issues present in the territory.

Furthermore, in the context of integrating different disciplines, certain concepts derived from *“Design From Peace”* have been adopted, inspired by an initial meeting during the thesis journey with **Professor Lilian González-González** from Anahuac University of Mexico. Specifically, the intention to seek solutions *“that allow us to tackle the challenges of violence that we confront in migration, disability, inclusion, and lack of resources as a main problem that generates conflict”*¹³ has been embraced.

Additionally, the thesis's objective can be interpreted more broadly, opening a debate on borders, not only those on the other side of the globe but also the **geographical barriers in the Mediterranean** that drive significant **migratory flows**.¹⁴ The intent, therefore, will be to proceed through **replicable steps and segments** of analysis in terms of methodology, while the content will need to be adapted to each specific context. This **flexible and adaptable approach** will allow the developed methodologies to be applied to various situations and contexts, ensuring that the solutions are always relevant and appropriate to the **specific needs of the territory under examination**.



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the territory

4.1 AN OVERVIEW

4.2 HISTORICAL DIMENSION

4.3 MORPHOLOGY & MOBILITY

4.4 POPULATION

4.5 ECONOMY

4.6 CULTURE

4.7 SEE CLOSELY

4.8 AN AREA OF ACTION

4.1

an overview

In the context of the World Design Capital designation and the exploration of design boundaries, it is crucial to establish a **comprehensive understanding of the project's geographical context**. Tijuana and San Diego, **despite their border status**, are two distinct cities with **unique characteristics**. They possess their own histories, shaped by **rich histories, populations, identities, and cultural backgrounds**. Before getting into the meat of the discussion, it should be recognized that the border, while a significant geographical feature, **does not define the essence of this region**. As evidenced by field research and exemplified by the *Chicano movement's* * protest slogan-

“ **We Didn't Cross the Border, the Border Crossed Us** ”

-the history of these two cities is **closely intertwined and deeply influenced** by their geographical location.

This chapter delves into the multifaceted aspects, contrasts, and connections between Tijuana and San Diego. The purpose is to **identify the potential and challenges that arise** from the project's geographical context. By understanding the dynamics of the region, a solid foundation can be built for **design decisions that address the unique needs of this binational community**.

* “The Hispanic community embarked on a social movement aimed at combating institutional racism, increasing cultural hegemony, and guaranteeing equal labor and political rights.” ¹

Children know no borders (April 11, 2024).
made by the authors



4.2

historical dimension

The analysis presented in this chapter stems from the reading of the book *"El Tercer País: San Diego & Tijuana: Two Countries, Two Cities, One Community"* ² by Michael S. Malone, published in 2020 by Silicon Valley Press. The book offers a fascinating reconstruction of the histories of San Diego and Tijuana, from their colonization to the present day.

A key aspect of the lived experiences and histories of these twin cities lies in their **markedly distinct evolutions**. **Tijuana, initially composed of private ranches** with minimal governmental presence, grew due to an artificial border first drawn **by the Catholic Church and later by the Spanish government**, eventually transforming into a dynamic metropolis. **San Diego, on the other hand, developed from the Mission** that bears its name, but only after **the 1848 war** between the United States and Mexico did it **experience significant growth**. Despite controversies between the two central powers, the story of San Diego and Tijuana is one of two cities that share **more similarities than differences**. These similarities include geography and climate, distance from central government, and the presence of a larger city to their north - San Diego for Tijuana, and Los Angeles for San Diego. This has led to the **formation of a cross-border community**, recognizing the interdependence of the two cities, making this stretch of border the busiest crossing in the world, and **providing a model of cooperation for other cross-border regions**.

authors' note

A timeline will accompany some pages of this chapter to allow for synoptic reading

legend

■ San Diego ■ Tijuana ■ Both cities/countries
■ U.S.A. ■ Mexico ■ Most important historic events
..... 1000 years 100 years

the early settlements

The initial European explorations were concentrated in the **Baja California region, specifically around La Paz**. In 1532, the conquistador **Hernán Cortés** sent an expedition to the area. It was only two years later, in 1535, that the first Spanish settlement was established by Cortés himself on the shores of La Paz. ³ However, two years later, overwhelmed by the harshness of the terrain and the **hostility of the Indians** who had not forgotten the ferocity of the conquerors, Cortés **decided to abandon the colony**. ⁴

Juan Rodríguez Cabrillo, aboard his ship *San Salvador*, was the first to lead a European exploratory expedition along the west coast of what is now the United States. The Cabrillo expedition set sail from the port of Navidad, near present-day Manzanillo, on June 27, 1542, with three ships, and **anchored in what is now San Diego** Bay approximately three months later, likely at Ballast Point, renaming the area San Miguel. **This exploration continued northward**, and Cabrillo died during the expedition on January 3, 1543, but his crew continued, likely reaching as far as Oregon before winter storms forced them to return to Mexico. ⁵

In 1596, **Sebastián Vizcaino** landed again in **Baja California**, this time renaming it La Paz and establishing a permanent colony. ⁴ He is also credited with the second exploration of the San Diego Valley in 1602. However, it would be more than a century before the first true explorations and settlements occurred in the Tijuana Valley.

It was not until May 1769 that **Captain Fernando de Rivera y Moncada** led an expedition into the **Tijuana Valley**, accompanied by friar Juan Crespí, setting a precedent for further exploration of the area. Just a few months later, a new expedition was led by Gaspar de Portolá, which significantly impacted the region's history, particularly due to the presence of the friar who accompanied him, Junípero Serra. On July 16, **1769, in the San Diego Valley, Father Serra celebrated mass**, and the settlement soon became a hub for meeting and conducting trade.

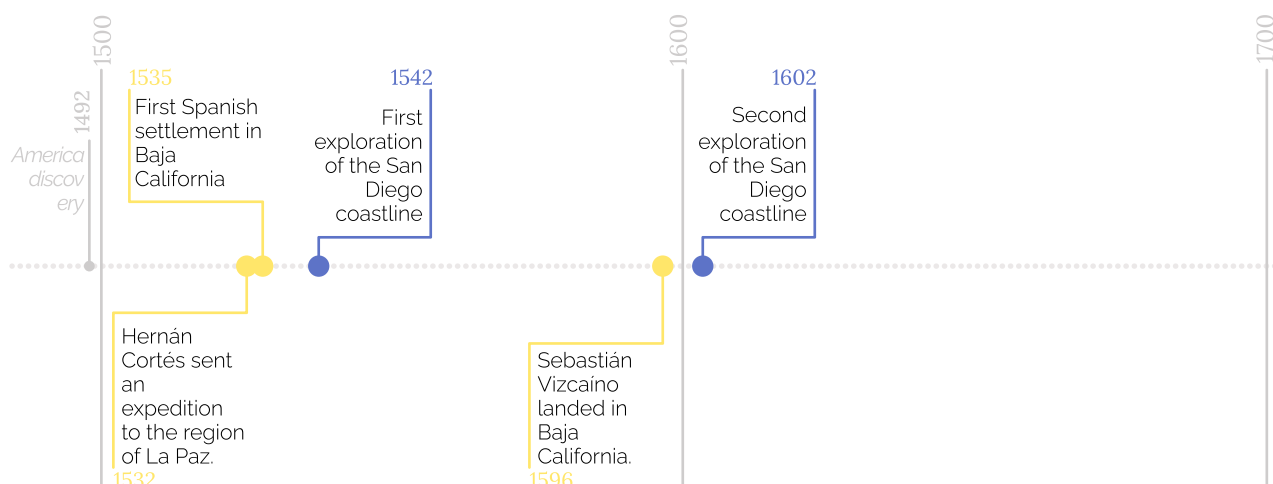
Gradually, the settlements grew, and the Mexican government decided that it was necessary to organize the region politically. Consequently, on April 24, 1772, **the territory was divided into two smaller provinces, Upper and Baja California**. Based on this division, Tijuana, unlike today, was placed under the control of the San Diego Mission and the Franciscans. This meant that even before its official establishment, **Tijuana was recognized as part of the future California**, with its political, economic, and spiritual orientation tied to the city of San Diego rather than Mexico City. These sentiments of belonging can be traced back to the city's name, possibly derived from the name associated with the area by the Yuman tribe, "Tiwan," literally "by the sea," or from the name of a local ranch, Tia Juana.

San Diego was founded on July 1, 1769, marked by the first Mass celebrated by Father Junípero Serra, who named it in honor of a Franciscan friar canonized in 1588. The choice of the site for San Diego's foundation was strategic. A few days after the foundation, Father Serra left to establish new settlements but not before **constructing a rudimentary chapel** in an area that would later be known as Chapell Hill.

In its early years, the mission in San Diego focused on **converting the Kumeyaay to Catholicism**. The monks who did not accompany Father Serra managed to baptize 100 indigenous people, 97 of whom chose to live at the mission.

In 1774, the mission was **relocated approximately 10 kilometers inland** due to the lack of water at the original site. The new location proved more favorable, and the mission prospered, becoming an important commercial and religious center. A **Spanish military presidio was built** near the mission for protection. In 1776, **construction of the church** began and by 1783, the church had celebrated nearly a thousand baptisms, and by 1797, the San Diego Mission had the largest native population in Upper California.

The relationship between the Spanish settlers and the Kumeyaay was **complex and often**



conflictual. Initially, the Kumeyaay welcomed the Europeans, offering them food and shelter. However, as the mission expanded and Spanish control over the land increased, the **Kumeyaay began to perceive the Europeans as invaders.** On November 5, 1775, a group of Kumeyaay warriors, led by shamans and religious leaders, attacked the San Diego mission in an attempt to drive the Spanish out of their land. The revolt ultimately failed when the Kumeyaay realized they lacked the strength to sustain the conflict and were forced to repent.

The **Mexican War of Independence**, which began in 1810 and ended in 1821, did not result in many battles in the Tijuana Valley, but it did renew many of the region's political and social institutions. The land was no longer governed by the Spanish monarchy, allowing it to be fully utilized by anyone willing to cultivate and care for it. **Former soldiers** from the San Diego Presidio decided to settle on the lands near **Mission Valley, establishing the first farms in the area.** Among them was Francisco María Ruíz, who settled at the base of the hill where the Presidio stood, giving rise to what is now known as **Old Town.**

In the nineteenth century, while **San Diego and Ensenada grew considerably, Tijuana** remained the site of only a **few ranches owned by a handful of families.** The most prominent among them was the Argüello family, whose history would intertwine with that of the two border cities, surviving the rise of the Mexican state and independence from Spain in 1821.

In 1823, one of the family's sons, Captain **Luis Argüello**, was appointed the political head of California, while his brother, **Santiago**, already a lieutenant at the San Diego Presidio, became the owner of what is now Tijuana. This was facilitated by a law passed in 1824 by the Mexican government, the **"Ley General de la Colonización"**, aimed at promoting the development of the new nation's untamed regions, such as Upper and Baja California. This led to a land rush in various territories, aiming to **attract as many Europeans** as possible to settle

in those areas. Those who professed Catholic faith, accepted Mexican citizenship, and agreed to work the land were granted 8,500 hectares.

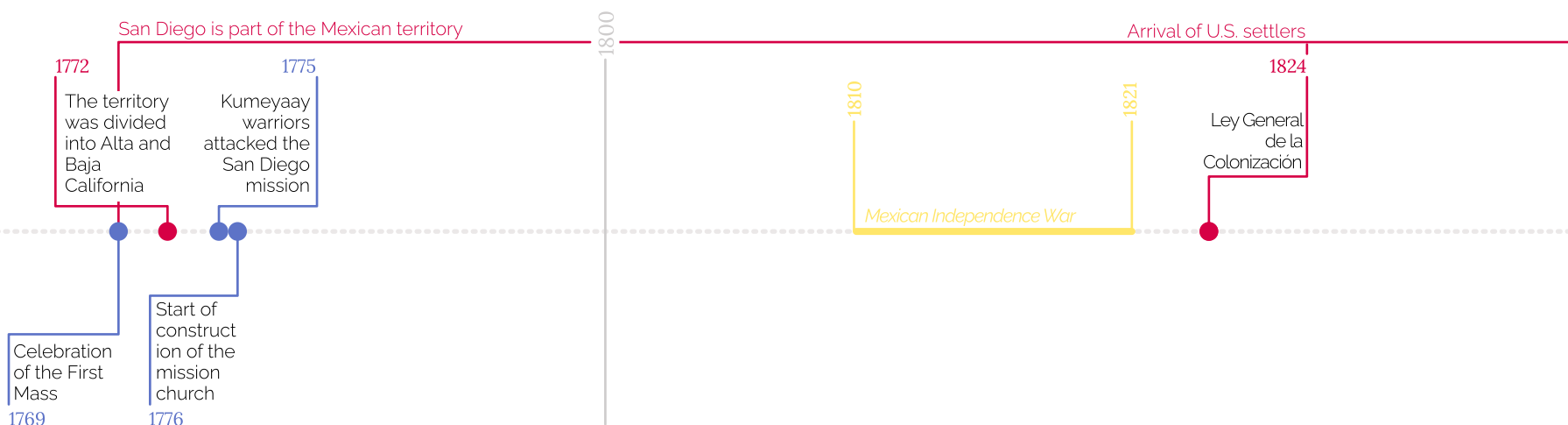
Luis Argüello ceded the governorship of California to Lieutenant Colonel **José María de Echeandía**, who moved from Monterey to San Diego following his appointment. This move greatly benefited Tijuana, which saw an increase in land value and attracted many more settlers. However, in March 1829, Echeandía decided to permanently legitimize **Santiago Argüello's control over the Tijuana ranch.**

Santiago proved to be a capable rancher, and together with his wife, ensured a fruitful lineage for the city. The following decades at the ranch were peaceful and prosperous.

In 1833, the Mexican state decided to secularize the **Catholic missions.** As the missions proceeded, the church **became an increasingly powerful landowner**, and through secularization, the state reclaimed these assets.

The 1830s brought significant changes to San Diego as well. The Mexican state allowed American migrants to enter California if they pledged allegiance to Christianity and loyalty to the Mexican state. Upon doing so, they were entitled to a land grant. A major draw for many choosing San Diego as their destination was Richard Henry Dana Jr.'s book, **"Two Years Before the Mast,"** which described San Diego as the best among all, with **its small harbor mostly protected by land, impeccable climate, and friendly locals.** He wrote:

"De todos ellos, Dana declaró que San Diego, con su pequeño puerto mayormente protegido por tierra (perfecto para cargar pieles), su clima impecable y sus amables lugareños, era el mejor. Se quedó un tiempo en San Diego y disfrutó mucho de su visita. Aunque era un bostoniano educado, se deleitó con las enormes fiestas y el abundante vino, la música y los habitantes locales, describiendo a los hombres como "despreocupados, orgullosos y extravagantes, y muy dados al juego" y a las mujeres como "con poca educación y mucha belleza" (que debe haber llamado la atención de otros marineros en casa). A



partir de ese momento, San Diego ocupó un lugar en la imaginación estadounidense.”²

(trans. “Among all, Dana declared that San Diego, with its small harbor mostly protected by land (perfect for loading hides), its impeccable climate, and its friendly locals, was the best. He spent some time in San Diego and greatly enjoyed his visit. Although he was a well-educated Bostonian, he delighted in the large parties and abundant wine, music, and local inhabitants, describing the men as ‘carefree, proud, and extravagant, and very fond of gambling’ and the women as ‘with little education and much beauty’ (which must have attracted the attention of other sailors back home). From that moment, San Diego held a place in the American imagination.”)

This led to a **land rush during the 1840s**, and the city underwent a change in governance in 1845, with **General Pío Pico** becoming the governor.

the manifest destiny

However, the tranquility lasted only until 1846, the year the United States declared war on Mexico. This moment was merely the culmination of tensions that had been escalating for years. At that time, Mexico was under the dictatorship of Antonio López de Santa Anna, who governed through **eleven separate presidencies between 1833 and 1855**, leading to the loss of Texas and much of the American West to the United States. Concurrently, the United States was building its **expansionist rhetoric**, known as “Manifest Destiny.”

The “**Ley General de la Colonización**” made Mexican territories **highly attractive to Americans**, particularly Scotch-Irish Americans, who moved to the border states. As Dario Fabbri explains in the podcast “*Stati di tensione*” the **Scotch-Irish Americans** were considered a bellicose population, with many being outlaws seeking to escape their sentences and attracted by the offer of land ownership.⁶ This group retained their loyalty to the United States, identifying themselves with the meticcio term “**Texicans**.”

In 1835, a provisional government independent of Santa Anna's Mexican dictatorship was established. This climate of agitation led to a series of conflicts, culminating on March 2, 1836, when **Texas officially declared itself an**

independent state. One of the notable clashes was the Battle of San Jacinto in 1836, resulting in a significant Mexican defeat.

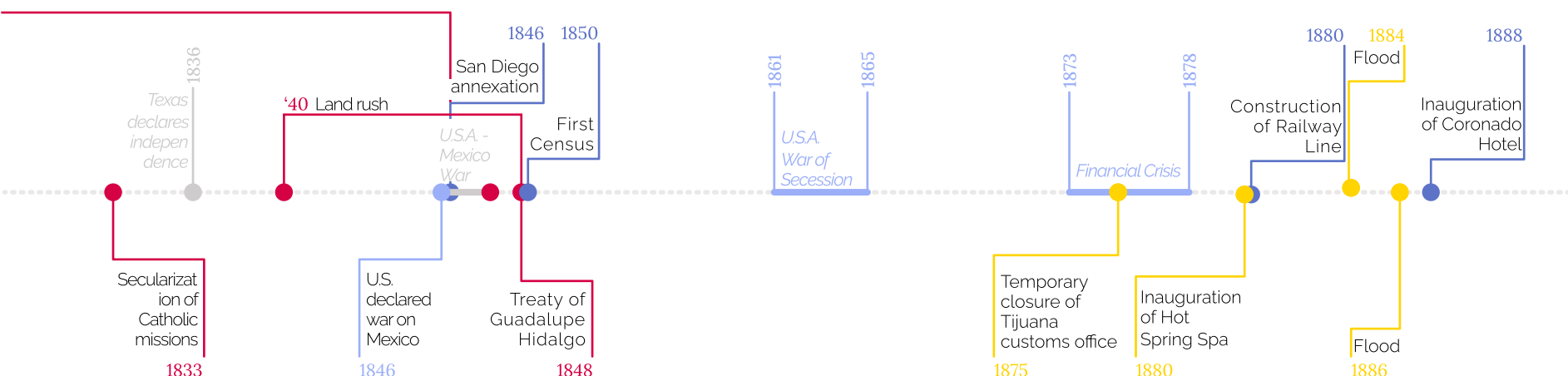
The **American victory at San Jacinto** reinforced the United States' belief in being the “**liberators**” of Mexican territories and fueled the desire to expand further west. When James Knox Polk became President of the United States in 1845, he was a fervent **supporter of “Manifest Destiny”** and wasted no time in pursuing the annexation of new Mexican territories.

Polk offered Mexico \$30 million for the purchase of California and New Mexico, but the proposal was rejected. In response, Polk ordered American troops to position themselves along the Rio Grande, within a contested area. This provocative act led to further clashes at Palo Alto and Resaca de la Palma in April 1846, ending in another Mexican defeat. With the war now inevitable, Polk asked the U.S. Congress to **declare war on Mexico**, which it did on May 13, 1846. Mexico never formally declared war on the United States but could not avoid **defending itself against the invasion**.

On July 29, 1846, the American warship USS *Cyan*, accompanied by a contingent of Californian volunteers, **docked in San Diego Bay**. The arrival of the ship marked a crucial moment in California's history, then still Mexican territory. Contrary to expectations, the American soldiers were **welcomed not with hostility but with open arms** by both American expatriates and the local Mexican population.

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The Mexican-American War lasted two years and concluded with a decisive American victory. Mexico was **defeated both militarily and politically**, leading to the resignation of President Mariano Paredes. In his absence, the country hastily formed a provisional government that negotiated the Treaty of Guadalupe Hidalgo, signed on February 2, 1848. This treaty had a **profound impact on Mexico** and sealed Tijuana's fate. By **ceding about half of its territory** to the United States, including California and New Mexico, Mexico lost much of its western lands.

The **Treaty of Guadalupe Hidalgo** marked a turning point for Tijuana. The creation of a political border, albeit artificial and poorly defined by the landscape, fostered the city's exponential growth. Although the United States initially sought to annex Tijuana, **Mexico staunchly opposed this**, aware of the territory's significance for connecting to the Baja California peninsula. Consequently, Tijuana assumed a frontier character, distinct from San Diego and Upper California, allowing it to develop with all the accompanying challenges and opportunities.

a border town

Before the war, the region was **united under a single identity**, sharing culture, religion, and institutions. The conflict **led to a profound division**: the **northern** settlers became predominantly **Protestant**, while **Tijuana**, remaining under Mexican rule, found itself **deprived of many of its traditional institutions**, such as the church and local government. Additionally, the commercial flows that had sustained the city's economy were disrupted. In the post-war chaos, Tijuana faced an unstable and corrupt Mexican government, **resulting in increased crime**. The economic situation was precarious, and the population suffered from poverty and unemployment.

The death of Tijuana's patriarch, Santiago Argüello, in 1862, sparked a contest over his inheritance. The **division of lands among his children led to a series of legal disputes**. In 1870, another of Santiago's sons, Francisco, sold a piece of land to an American investor, Cesar A. Luckhardt.

The establishment of **the border** transformed the area into an **important source of revenue** for the Mexican government:

- On one hand, there was **control of commerce**. The California Stage Company had inaugurated a stagecoach line that

passed through Tijuana, transporting goods to and from the Mississippi River. The customs office would allow for the regulation and taxation of these commercial flows;

- On the other hand, there was **control over the flow of people traveling across the border**. The horse-changing stations of the Butterfield Overland Mail Company, located in both the United States and Mexico, attracted visitors who stopped in Tijuana to rest and shop. The customs office could control this influx of people and money, allowing the central government to profit.

The construction of the customs office **was not welcomed by the local population**. Citizens feared that such a measure would stifle the small local economy. These protests **culminated in the temporary closure of the customs office** in 1875. Contrary to expectations, the establishment of the customs office benefited the city, improving its status in the eyes of San Diego and increasing the number of cross-border visitors, prompting some to invest in businesses near the customs office to cater to the needs of wealthier tourists.

One of the first such investments was the creation of the **Hot Spring spa**, inaugurated in 1880. Its thermal springs attracted a large number of visitors from San Diego and beyond. The spa was so successful that within a few months, other entrepreneurs from **San Diego had created a network of services to transport U.S. residents to their daily spa visits**. Moreover, many of these visitors expressed the desire to stay in Tijuana for more than a day, prompting the Hot Spring spa to build a hotel, which spurred the emergence of new commercial activities.

The **floods of 1884 and 1886**, however, marked a tragic moment for the city, causing significant damage to infrastructure and the local economy. Nevertheless, Tijuana **quickly recovered**, addressing the damage and continuing its development. The last decades of the 19th century were a flourishing period for the city. It **established its first school, repaired roads, connected to Ensenada via telegraph**, and benefited from the **arrival of the transcontinental railroad to San Diego** in 1885, which **brought electricity and new business opportunities**. This progress was made possible largely due to the benign neglect of the central government under Porfirio Díaz.

a difficult growth

The Treaty of Guadalupe Hidalgo, signed in February 1848, and the subsequent news of the gold discovery in California, laid the groundwork for one of the most significant upheavals in United States history.

The **Gold Rush in the Sierra Nevada** triggered rapid growth in California's cities, particularly San Francisco and Sacramento, but also San Diego. The latter became a **crucial port of call for eastern gold seekers and businessmen** navigating the Pacific coast.

A **battalion of soldiers**, mostly composed of Mormons who had set out to assist the Californian city during the U.S.-Mexico War, arrived after the war had ended. They entered into a contract with the local citizens, which allowed them to improve infrastructure and build city services. The **Mormons are also credited** with conducting the **first census of San Diego in 1850**, recording 248 white residents, 483 converted Indians, 1,550 indigenous people, 3 black residents, and 3 native Hawaiians. On March 27, 1850, the city of San Diego was officially recognized with an official population of 798 residents, and Joshua H. Bean, a former soldier, became its first mayor.

The **Civil War**, which erupted in the early 1860s, had a significant impact on **San Diego's economy, slowing its growth**. The so-called "War of Secession", which lasted from 1861 to 1865, was caused by **internal differences and divisions within the country**, primarily between the industrialization of the **Northern states**, which lacked a slave system, and the still agricultural economy of the **Southern states**, heavily reliant on slavery. In February 1861, eleven Southern states declared independence from the Union, forming the Confederate States of America. This prompted a military response from the Northern states, who ultimately prevailed in 1865.

Despite the historical significance of this event, **San Diego was relatively unaffected** due to its location in the extreme Southwest. However, as previously noted, it was a period that stymied the city's growth. After the war, in 1867, Alonzo Horton attempted to **revitalize the city by purchasing land and promoting the development** of New Town, originally founded in 1850 by Hawaiian William Heath Davis. Horton's efforts led to the construction of the **"Horton House Hotel"** and the creation of **Balboa Park**. A fire in 1872 proved providential, destroying Old Town and **prompting a significant relocation of people**, along with the social and economic life of the city.

Another **setback to the city's growth occurred** in 1873 due to a **financial crisis** that lasted until 1878. Nonetheless, thanks to its strategic location, **San Diego managed to mitigate the problem** and continued to grow, albeit slowly.

In 1880, the **city benefited from the construction of a railway line** by the Atchison, Topeka and Santa Fe Railway Company, which extended its line to San Diego. The first train from San Diego departed in 1885, finally connecting people and allowing the **export of local products**.

The arrival of the railroad facilitated rapid growth, leading to economic expansion, including the **establishment of a gas factory, the creation of a telephone company**, and the provision of citizen services such as the first high school and the first park.

One of the most significant events of the period was the commencement of the construction of the **Hotel Coronado** in 1880, which was inaugurated on Valentine's Day eight years later. The hotel became a symbol of change and growth in the city, establishing itself as one of the most celebrated and largest hotel structures in the United States. The opening of the Hotel Coronado **catalyzed change in San Diego**, leading to the swift establishment of the San Diego Yacht Club, the Cuyamaca Social Club, and the Excelsior Rowing and Swimming Club.

aquí empieza la patria

At the dawn of the 20th century, the development of **Tijuana as we know it today began to take shape**. The city had a population of 242, still small compared to San Diego's 17,700. However, in the following decade, Tijuana grew to **510 residents and reached 1,228 inhabitants** by 1920, while **San Diego's population soared to 74,361**. One of the causes of Tijuana's slow growth was the seemingly endless legal disputes among the Argüello descendants. On January 30, 1889, the dispute was resolved by dividing the properties **into two economically equivalent parts**, thanks to the intervention of **Ricardo Orozco**, who estimated the value of both sides.

Orozco's **building plan** fortunately succeeded and was rapidly adopted in 1890. This intervention occurred at a propitious moment, as torrential rains returned in February of the following year, nearly destroying the old city. However, the outlines of the new Tijuana were already in place, **ready for a new beginning**.

Tijuana continued to thrive due to investments from wealthy American families. According to historians David Piñera and Gabriel Rivera, most of the real estate purchases by speculators during those years were made near what is now Avenida Revolución, **Avenida Cinco de Mayo, and Sexta and Séptima Calles**. A driving factor was their **proximity to the border**, but equally important was that these streets were on relatively **higher ground and thus less likely to**

less likely to be affected by future floods.

Despite the strong influence of Catholicism, Tijuana remained a Wild West town, 2,414 kilometers from the **Mexican capital and practically beyond its control**. In contrast, San Diego was becoming a civilized and Protestant city, effectively enforcing the laws of its nation. It is unsurprising that American citizens, faced with the repressive climate of San Diego, saw **Tijuana as an outlet for their desires**, attracted by the willingness of Tijuana residents to make easy money. Among these was **Alexander Savin**, who had already opened a famous handcraft and gift shop called Bazar Mexicano and wanted to invest in a bullring in Tijuana.

In addition, during the same years, Julio Argüello built a hotel, Agua Caliente, demonstrating that a **significant percentage of visitors** were interested in staying in Tijuana to enjoy the local culture for several days.

Cross-border cooperation and illegal immigration between the United States and Mexico are often perceived as late 20th-century phenomena, but these issues **have deeper roots in the events that marked the late 19th century**.

The increasing number of American visitors to Tijuana, combined with a still-porous border, led to a rise in **cross-border crime**, as criminals from both sides used the border to evade arrest. This phenomenon culminated in the **killing of a Mexican citizen by an American soldier** at the border. This incident raised the issue of border control, prompting local political leader Rafael García Martínez to strengthen government presence and promote Tijuana as a municipality. However, the central government did not grant the request; Tijuana would only become a municipality after World War II. At the beginning of the 20th century, the regime of Porfirio Díaz began to falter. After the U.S.-Mexico War, the region was targeted by American filibusters seeking to create sovereign nations. In 1905, the Partido Nacional Antirreeleccionista of Texas, led by **Francisco Madero**, initiated a process that would spark the **Mexican Revolution of 1910**, leading to Díaz's immediate resignation. In Baja

California, the rebellion was led by **Ricardo Flores Magón**, an anarchist lawyer and journalist, who mobilized forces in Mexicali and Tijuana with the support of **anarcho-syndicalists**, Americans, and local indigenous people. In 1911, the **Magonists captured Mexicali and advanced on Tijuana**, where they faced resistance from federal forces but eventually prevailed. In June 1911, forces loyal to Vega, supported by Madero's transitional government, definitively defeated the Magonists, **leaving the city devastated and looted**. The Mexican Revolution **continued for a decade**, causing prolonged civil war, political assassinations, and deep social transformations.

In the **1920s, Tijuana flourished**, benefiting from its **proximity to San Diego and Prohibition** in the United States, which attracted numerous tourists and investments. However, its relationship with San Diego was a double-edged sword, transforming Tijuana into a **haven for wealthy Americans' vices** and **giving the city a bad reputation**, not only in Mexico and the United States but also worldwide. Each decade saw Tijuana cater to different appetites of its northern neighbors: **alcohol** in the 1920s, **nightclubs and casinos** in the 1930s, **brothels and liquors** in the 1940s, **accessible abortions and divorces** in the 1950s, and **foreign products** not available in the U.S. in the 1960s.

In 1920, the adoption of the **Eighteenth Amendment** in the United States, which prohibited the production, transportation, and sale of liquor, led to a **flourishing clandestine and mafia market** in the Mexican city, with smuggling permeating the border. The commercialization of alcoholic beverages **brought many of the best German-American brewers to Mexico**, giving rise to the Mexican beer industry. Prohibition also facilitated the rise of mafia organizations, such as **Al Capone's**, which began to control Tijuana's casinos. However, the arrival of the mafia **reduced petty crime**.

In 1916, a few years before the start of Prohibition, **Esteban Cantú** became governor of Baja California. In the following years, he built services and infrastructure throughout the



region. He is credited with constructing the **military barracks** near the Cathedral of Our Lady of Guadalupe, **modernizing the elementary school**, and overseeing the construction of the **National Road**, which would finally connect Baja California to the rest of Mexico. Among the most significant interventions during his tenure was the **opening of the racetrack**, funded by investments from across the border, which was an immediate success due to its location near the border.

In 1920, **Abelardo L. Rodríguez**, a member of the Sonora group that overthrew President Venustiano Carranza, replaced Governor Cantú and became a key figure in Tijuana's development. Prohibition transformed Tijuana, leading to a **veritable "land rush"**. Under Rodríguez's leadership, Tijuana continued to develop as a center for smuggling and gambling. In 1926, the new governor purchased 243 acres of land at **Agua Caliente springs** and built a hotel, casino, hot springs, and tracks for horse and greyhound racing.

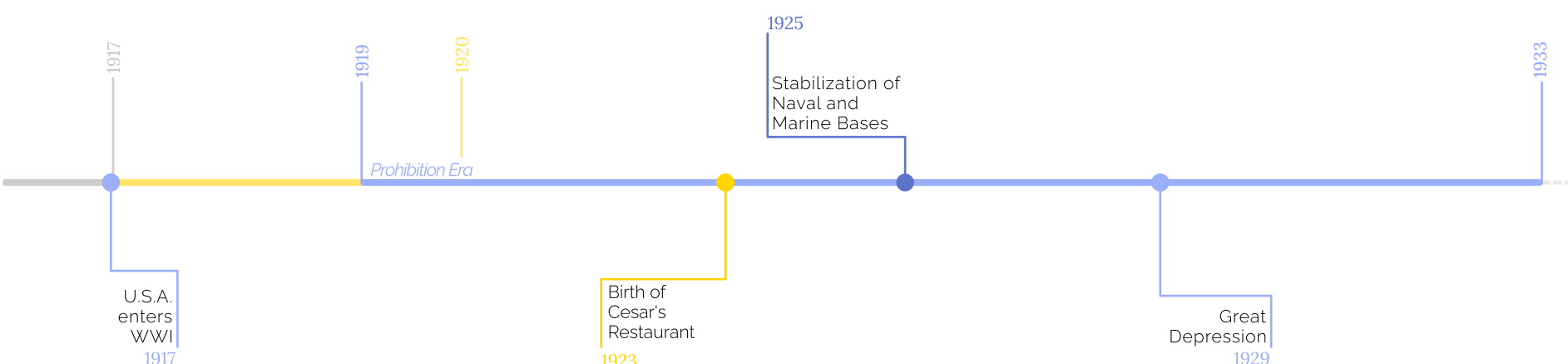
These new attractions transformed **Tijuana into a city alive 24 hours a day**, with perpetual traffic jams at the border crossing and downtown. The population grew from 1,200 in 1920 to 11,271 in 1930. However, everything collapsed in October 1929 with the **Great Depression**, leaving both **countries struggling** to overcome the crisis. The Great Depression marked a period of contrasts for Tijuana. On the one hand, the **residential areas** of Castillo and Escobedo-Chacho **grew**, but on the other, **the flow of tourists slowed, and attendance at bars, restaurants, and casinos declined**. The offerings became more extreme, and the **city filled with brothels and drugs**, with an increase in crime, particularly fraudsters and robbers. Regarding this period, historian Oscar Jaquez Martinez states:

"Prácticamente de la noche a la mañana, Tijuana se convirtió en el distrito rojo de San Diego, el puerto de escala favorito de los marineros alborotadores. Los inversionistas estadounidenses en Tijuana la promueven como el lugar donde 'las bebidas nunca se detienen', mientras que los prohibicionistas la condenaron como 'el camino al infierno'. Así nació la 'Leyenda Negra de Tijuana'.

*frase con la que los tijuanaenses se refieren a la reputación de su ciudad como capital del pecado. Mientras tanto, San Diego comenzó a enorgullecerse de ser una ciudad limpia y totalmente norteamericana."*²

(trans. "Virtually overnight, Tijuana became San Diego's red light district, the favorite port of call for rowdy sailors. U.S. investors in Tijuana promoted it as the place where 'the booze never stops'; while prohibitionists condemned it as 'the road to hell'. Thus was born the 'Black Legend of Tijuana', a phrase with which Tijuanaenses refer to their city's reputation as the capital of sin. Meanwhile, San Diego began to pride itself on being a clean, all-American city.")

In 1933, with the **repeal of the 18th Amendment** by Roosevelt, Tijuana **faced a choice**: continue to pursue profit or start anew. It opted for the former, and even today, many San Diego residents avoid crossing the border. The inhabitants of Tijuana, when traveling the world, often encounter looks of concern, disdain, or pity upon mentioning their city.

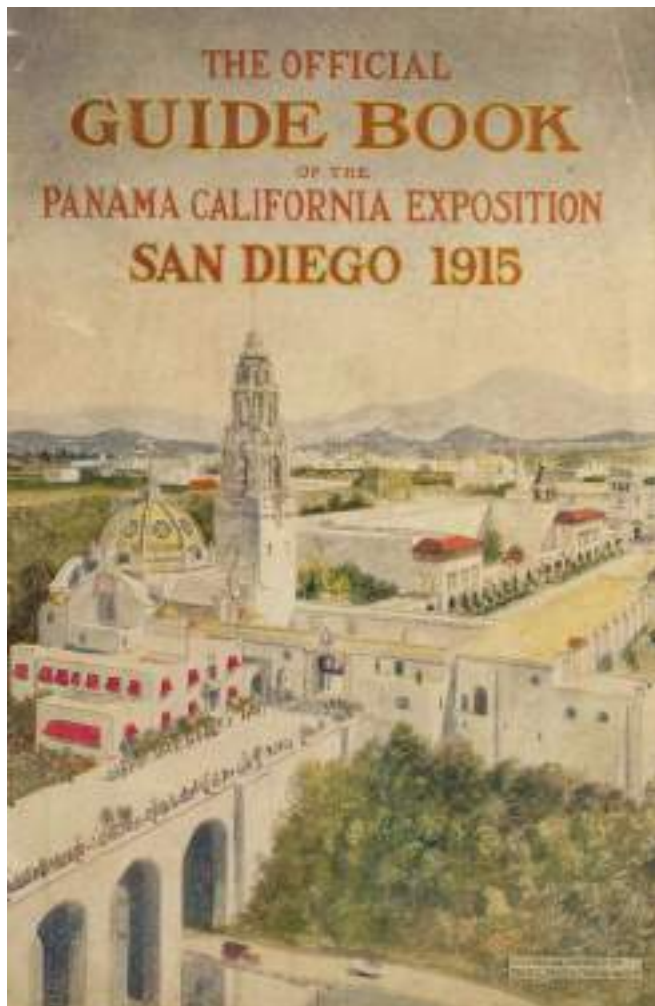


only a military city?

Despite the **financial crisis of the 1890s**, San Diego entered the new century with relative tranquility. With a population of approximately 17,000, it was a considerable city for California at the time. However, **its isolated location** excluded it from the **explosive growth** that characterized other cities, particularly Los Angeles.

During the Mexican-American War, the cities of San Diego and Los Angeles were similar in size. After the war, however, **Los Angeles** experienced **significant growth** due to **better railroad connections**. Meanwhile, **San Diego** was distinguished by its **pleasant climate and less congested environment**. Additionally, the discovery of oil and the development of the film industry in Los Angeles further accentuated the differences between the two Californian coastal cities.

The first decade of the 20th century was a rather prosperous period for San Diego. The **population tripled**, resulting in the emergence of new **residential neighborhoods** and communities, such as **Little Lenders** and **Ocean Beach**. This period also saw the establishment of new amenities, including **banks, theaters, and the first skyscrapers**.



*The Official Guide Book of the Panama-California Exposition San Diego 1915. (1915).
from Wikimedia Commons*

Some of these changes can be attributed to prominent figures of the time, such as **John Spreckels**, who contributed to the development and improvement of certain infrastructures and actively supported the establishment of institutions like the **Scripps Institution of Oceanography**. However, **his control** over both local **newspapers** limited the freedom of expression and dissent against him.

Towards the end of the decade, San Diego prepared for the **Panama-California Exposition of 1915**. New buildings were constructed for the event in Spanish Baroque style, most of which still stand in **Balboa Park**. The exposition opened on January 1, 1915, while **World War I** had already been raging in Europe for five months. Notable attendees included the Governor of California, a representative of King Alfonso XIII of Spain, Vice President Thomas Marshall, former President Theodore Roosevelt, and future President Franklin D. Roosevelt. The exposition closed on December 31, 1915, with a **fireworks** display centered on the **theme of world peace**, ironically just before the United States would enter the conflict.

The Spanish flu pandemic marked the 1920s, causing numerous deaths, especially among young and middle-aged adults. Additionally, the **implementation of Prohibition** in the United States led many to seek alcohol in nearby Tijuana. During these years, **Rancho Santa Fe** was established, attracting celebrities such as Douglas Fairbanks and Mary Pickford.

The Great Depression at the end of the 1920s hit San Diego hard, **paralyzing its growth** and that of Tijuana, which also suffered from the end of Prohibition shortly thereafter. However, there were **some positive developments**: the creation of the first **professional baseball team**, the Padres, and the construction of the new campus for **San Diego State College**. The 1930s were marked by **difficulties and tensions**, with incidents of **racism** against Mexican children and an **increasing military** presence.

The military presence in San Diego was already significant when the **Great White Fleet** arrived in **1904**. This led to the opening of the aviation training school in the city in 1911 and the stabilization of **naval and marine bases in 1925**. **After Pearl Harbor**, in 1942, San Diego experienced enormous **population growth**, with military personnel and civilians arriving to work in the war industry. This trend continued even in the **post-war era**, transforming San Diego into one of the largest military retirement communities in the United States while continuing to **attract young** people wishing to **join the fleet**.

border shifts in WWII

During **World War II**, San Diego established itself as a significant **training area for the United States armed forces**. Following the attack on Pearl Harbor, **the region saw the passage of hundreds of thousands of military personnel**, ready for training. These young men, far from home and with money to spend, sought **entertainment and leisure in Tijuana**.

By 1940, Tijuana had become a **municipality** of 16,500 inhabitants, populated not only by Mexicans but also by **European refugees**, particularly Jews fleeing Nazism, who, unable to enter the United States, sought refuge in border cities. These refugees contributed significantly to the **flourishing commercial activities** of the era.

A notable incident occurred in 1938, involving the **rape of a young girl** by a soldier named **Juan Castillo Morales**. Two local labor unions led a protest, rallying the people from the barrios against the fort, which was subsequently set on fire. The military leaders, fearful of the chaos, tried and executed Juan Castillo Morales, accusing him of the assault. After the execution, public opinion began to consider Morales a martyr of governmental corruption, even developing a **religious cult around him**, that of Juan Soldado, who is now venerated by some as the patron **saint of those crossing the border illegally**.⁷

Mexico's military involvement in World War II was relatively limited, but there were other ways for Mexico to contribute significantly. **Relations between Mexico and the United States intensified in the 1930s**, especially after U.S. President Franklin Delano Roosevelt implemented the **Good Neighbor Policy towards Latin American countries**.⁸

Mexico entered World War II **after the attack on Pearl Harbor** in 1942. This act of aggression led Mexico to sever ties with the Axis powers and align with the Allies, in solidarity with the United States. On December 10, 1942, the **United States**, concerned about a possible Japanese attack through Mexican territory, decided to **send troops to Mexico**. However, these troops encountered **resistance from the Mexican**

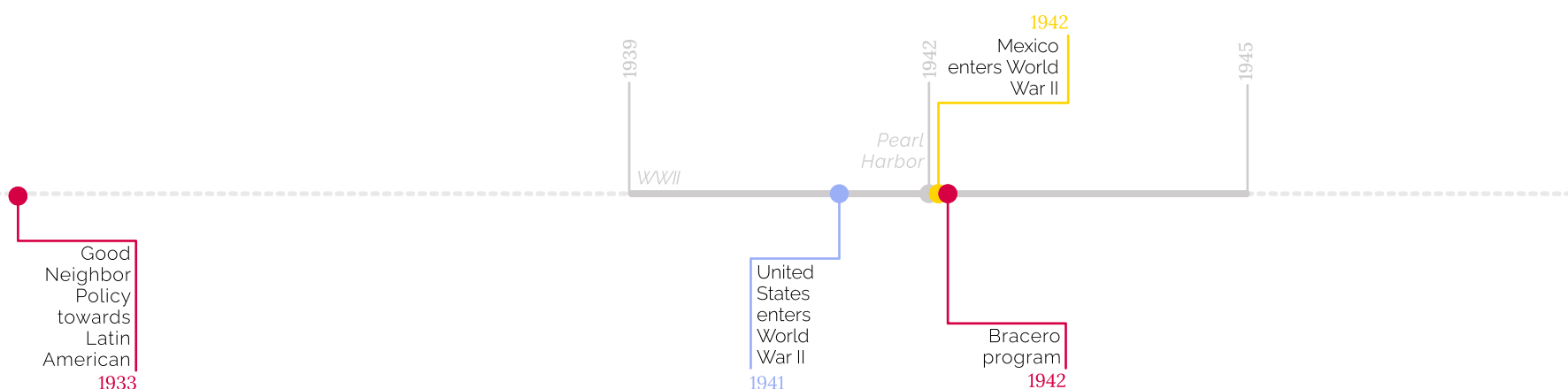
armed forces and civilian volunteers under the command of **General Lázaro Cárdenas**. What could have escalated into a conflict was **resolved through negotiations** between the generals of both sides, setting a precedent for **cooperation between the law enforcement agencies of both cities two decades later**.

Due to **frequent clashes** between the **Marines** and the **local police** in Tijuana, **the city decided to ban their entry**. However, this did not deter tourists from the area, who compensated for restrictions on fuel and tires by traveling from Southern California to spend the weekend and stock up on supplies when goods were available.

Despite the tensions, **the war also created new opportunities for collaboration** between Mexico and the United States. Among these was the Treaty on Rivers, still in effect today, which involved a series of **decisions** regarding not only the **Colorado and Rio Grande rivers** but also the **Tijuana River**. However, the most significant maneuver was the **Bracero Program**, a bilateral agreement that **allowed Mexican workers** to temporarily migrate to the **United States to work in agriculture**. During those years, the U.S. economy had transformed into a **war economy**, and the availability of laborers from across the border benefited both parties. This program provided Mexico with a **valuable source of income** and helped alleviate the labor shortage in the United States.

Tijuana became an **important transit point** for Mexican laborers heading to the United States. The city experienced a **rapid population increase**, growing from 16,000 inhabitants in 1940 to 65,000 by the end of the decade.

After the war, the **United States** experienced a **demographic boom**, with many new families embarking on **road trips**, extending to border cities like Tijuana. Additionally, **former soldiers** who had enjoyed the milder climates of these cities decided to **relocate to California**, to places like San Francisco, Los Angeles, and San Diego. This influx of people led to a **renaissance in Tijuana**. The city, once considered an "amusement park for Americans," began to



develop a sense of independence and autonomy, with the **construction of infrastructure such as schools, churches, libraries, and more.** Tijuana transformed into a real city, with **hotels, a downtown area filled with retail shops and restaurants.** On weekdays, people gathered in churches or local parks. By the late 1940s, Tijuana, **once considered the "poor cousin" of San Diego,** began to increasingly resemble its neighbor, becoming **more self-sufficient.**

In **1953,** with the establishment of Baja California as the 29th Mexican state, bilingual television channel six was also launched. During the presidency of **Miguel Alemán Valdés, from 1946 to 1952, Mexico experienced an "economic miracle,"** but also a notable **increase in corruption.** His successor, **Adolfo Ruiz Cortines,** extended the economic miracle by combating corruption and emphasizing fiscal austerity, in addition to **granting women the right to vote.** Tijuana also grew culturally, with the founding of new cultural institutions such as the **Universidad Autónoma de Baja California,** and the city.

became a **hub of increasing artistic and intellectual activity.**

Postwar San Diego saw significant population growth, from 330,000 inhabitants in 1950 to over 700,000 by 1960. This period was also marked by **profound changes.** **Disneyland opened in 1956,** making Southern California an even more popular tourist destination and **boosting tourism in San Diego** and Los Angeles. In the same year, the **University of California San Diego (UCSD)** was founded, strongly supported by industries that financed it, such as **Convair and General Dynamics Corporation.**

The rapid growth of San Diego led to an increased **civic awareness** of sharing its fate with nearby Tijuana. **Mexican students began attending schools in San Diego;** moreover, the flow of workers and shoppers from across the border increased. This scenario was substantially influenced by **cross-border collaborations** aimed at solving common problems, with the Bracero Program being a precursor to such collaborations.



A Sigma Pi sorority chapter from Calexico, cross into Tijuana (1950).
from Business Insider



Migrants, including a pregnant woman, wait for inspection to cross the US-Mexico border (1950).
from Business Insider

Founding of UCSD
1960

1966
Founding of SANDAG

1971
Inauguration of Friendship Park

Binational Migrant Education Initiative (BMEI)
1976

new beginning

The 1960s marked the beginning of a new era of relations between the cities of San Diego and Tijuana, united by a **nearly geographical** border but separated by **profound historical, social, and economic differences** that reflected the realities of their respective countries. This contrast is illustrated by the common perception of associating the **Mexican peso** with "**plata**" (silver) and the **U.S. dollar** with **gold**. Despite the preexisting difficulties and tensions, this period saw the emergence of growing collaboration and mutual **recognition of interdependence** between the two cities. **Collaborations** occurred in various fields, not only in **commerce and economics**, based on a fabric of preexisting relationships and investments, but also in **social, environmental, and political domains**.

Despite the **warm welcome** extended by the residents of Tijuana, they harbored a deep wound from the war between the United States and Mexico. Mexico had a long and rich history, being one of the cradles of civilization, while the United States was seen as newcomers who had expanded at Mexico's expense. In **U.S. history books**, this war appeared as a **minor event**, but for **Mexicans**, it **had been a national catastrophe**, leading to the loss of half of the country's territory.

Adding to this aspect were the **numerous prejudices** that Americans held against **Mexican citizens**, often viewed as ignorant peasants lacking in morals. This belief was so strong that it was reflected in the images depicted on **tourist postcards from Tijuana**, as described by historian Oscar Jaquez Martinez:

*"La imagen más difundida es probablemente de un campesino recostado contra un saguaro con las rodillas recogidas contra su pecho y el sombrero inclinado sobre su cara mientras toma una siesta. Cuando se trata del retrato de una mujer, normalmente luce un peinado alto, de dama española, y lleva un vestido con holanes, de escote bajo y dejando los hombros al descubierto. Su cabeza está inclinada hacia atrás alegremente, y sí, tiene ojos oscuros 'parpadeantes' y sostiene una rosa en la boca."*²

(trans. "The most widespread image is probably of a peasant resting against a saguaro with his knees drawn up to his chest and his hat tilted over his face while taking a nap. When it comes to a woman's portrait, she usually has a high, Spanish-style hairstyle, and wears a dress with flounces, a low neckline, and bare shoulders. Her head is cheerfully tilted back, and yes, she has dark 'flashing' eyes and holds a rose in her mouth.")

Historically, Tijuana was seen as a center of vice and crime, but much of this reputation was fueled by the active participation of American citizens themselves. Many believe that before the alliance between the two cities emerged on the public scene, a sense of what was to come took place within **a ranch located** just under 65 km from Tijuana, in the town of **Tecate**.

This story takes root from a **few individuals who laid the foundations** for a collaboration that literally transcended human borders:

- Founded by **Deborah and Edmond Szekely** in 1939, **Rancho La Puerta** became a renowned health and wellness center attracting visitors from both sides of the border.
- **Alejandra Mier y Teran**, whose father was a pioneer of the maquiladoras, grew up in a cross-border family and became the executive director of the **Otay Mesa Chamber of Commerce**.
- **José Galicot** contributed to the **development of tourism** and **telecommunications** between the two cities.

Thanks to these figures, in the 1970s, a group of leaders from San Diego and Tijuana, including **Mary Walshok** and sociologist **Chuck Nathanson**, collaborated with **Lucy Killea** from Tijuana to create "**Fronteras de las Californias**". This initiative laid the groundwork for lasting and systematic collaboration between the two cities.

For over 200 years, San Diego and Tijuana had separately faced common **environmental problems** such as **floods, droughts, and pollution**. In the 1980s, recognizing that they shared the same ecosystem, the two cities began to undertake joint actions on various fronts. The first promoter of these initiatives was **Paul Ganster of San Diego State University**, who in 1988 organized a **crucial conference that brought together scientists and officials from both sides** of the border to discuss water quality issues. This collaboration led to the creation of an international **wastewater treatment plant in 1997** and the modification of the 1944 water treaty.

However, it was a dinner hosted at the home of philanthropist **Yolanda Walther Meade** in Tijuana that radically changed the dialogue between the two cities. The dinner brought together **business people** from both sides of the border, recognizing in their counterparts across the border commonalities **despite not speaking the same language**.

The park, now known as Border Field State Park, was **intended to be a symbol of good diplomatic relations** between the United States and Mexico, initially featuring a simple barbed wire boundary that allowed people from both countries **to meet and shake hands**. The park also hosted various **cultural and social events**.

However, in 1994, due to concerns about **illegal immigration**, a **22.5-mile-long wall was built**, crossing the park. This wall, made of corrugated metal sheets, **limited contact but still allowed some forms of interaction**. Following the **September 11, 2001 attacks**, security was tightened, and in **2009 the park was closed** for the installation of a second parallel fence with barbed wire, sensors, and cameras.

In 2012, under local community pressure, the **park was reopened** with additional restrictions. A new outer fence **limited public access without Border Patrol permission**, allowing a maximum of **10 visitors at a time** to enter the space between the fences and see those on the other side, attempting to touch the tips of their fingers.

These events highlight how **the wall**, being a product of human operation, **is subject to changes and modifications in response to the historical, social, and cultural shifts of a population**, impacting the lives and relationships between neighboring communities.

A further turning point was the journalist from the San Diego Tribune, **Nail Morgan**, who in 1963 **published a book describing San Diego** as a modern and sophisticated metropolitan area, emphasizing its **connection to Mexico**. From the late 1980s, Morgan used his column to promote a vision of San Diego and Tijuana as part of a single cultural region. His influence grew, and in 1989, he wrote an **important essay for National Geographic**, **celebrating the ties between the two cities**. Without sugarcoating the negative aspects of the border, he highlighted them as challenges to be addressed.

Finally, in **1991**, **Mary Walshok** proposed the creation of the **San Diego Dialogue**, an initiative aimed at addressing cross-border regional challenges through an **innovative organization involving leaders from various sectors**. The goal was to promote **civic renewal**, thoughtful analysis, and consensus on the region's future, engaging both the public and elected officials.

The Dialogue had a **flexible and non-hierarchical structure**, with members chosen for their ability to think for the common good and their reputation for fairness. **Chuck Nathanson** was the key figure in facilitating the Dialogue, creating a smooth decision-making process and promoting collaboration among participants. The Dialogue was divided into **three circles**: the first for the public, the second for non-decision-making guests, and the **McGill circle**, the most exclusive, **reserved for influential individuals** who guided the main decisions. Many participants in the McGill circle later joined the **Smart Border Coalition**, which emerged as the successor to the San Diego Dialogue, continuing to promote cross-border cooperation.

One of the main works of the San Diego Dialogue was the profiling of people crossing the border, entrusted to **Alejandra Mier**. Analyzing interviews at the border, Mier discovered that most of the people crossing were regular commuters, not occasional migrant workers. This discovery revealed the **enormous impact of crossing on work and business productivity**, transforming the understanding of the border and the relations between San Diego and Tijuana. The publication of the **data changed the perception of the border**, demonstrating that San Diego and Tijuana were interdependent for economic success.

After Nathanson's death in 2003, the Dialogue disbanded, but its impact continued through the Smart Border Coalition and the **Mexico Business Center of the San Diego Regional Chamber of Commerce**. The Dialogue left a legacy demonstrating that San Diego and Tijuana not only shared a border but also the responsibility and ability to transform it.

Finally, the last crucial element of this historical period was the inauguration in August 1971 of **Friendship Park** at the border between San Diego and Tijuana, attended by **First Lady Pat Nixon**.

1994: turning year

In 1994, the relationship between San Diego and Tijuana underwent a **significant transformation**, profoundly influencing the interaction between these border cities. This year marked a new awareness of the **shared responsibilities between the two states** regarding border dynamics, particularly in **terms of security**. Two key developments laid the foundation for this new framework of cooperation. Firstly, there was an evolution in the **perception of borders**, which were no longer viewed solely as lines of sovereignty demarcation, but rather as areas of flow for goods and people, linking economies and labor markets. Secondly, the perspective shifted from viewing **border security** and **trade facilitation** as mutually exclusive goals to an approach that considered them **complementary objectives**.

The **increase in illegal immigration** during the 1990s posed numerous challenges for the residents of San Diego and Tijuana, who found themselves dealing with local issues without adequate support from their respective national governments. Concurrently, the two cities began to be better regarded for their cross-border relations. Crucial in this regard was the **role played by maquiladoras**, which attracted **significant investments** and contributed to economic stability in the region. These entities, which **imported materials from other countries to export finished products**, became a vital **engine in Tijuana's economy**, stimulating development and creating numerous jobs.

The implementation of the **North American Free Trade Agreement (NAFTA)** in 1994 generated increased interest in **Northern Mexico**. The trade agreement encouraged **economic integration** among North American states, **facilitating commerce and investment** in the border region. However, NAFTA also exacerbated existing concerns regarding illegal immigration.

Many impoverished Mexicans viewed the United States as a land of opportunity, with streets "paved with gold". This perception drove **many farmers to migrate north in search of better economic prospects**, despite the associated risks. In the 1980s, the migration flow was already evident, with thousands attempting to cross the border illegally each day, exploiting weak surveillance and ineffective fencing. Between 1986 and 1994, **few efforts were made to control the border** and prevent the employment of unauthorized workers. Despite the introduction of new laws, border security remained inadequate, with an exponential increase in the number of irregular migrants.

In the 1990s, the number of migrants increased dramatically, **many of whom stayed in Tijuana**. However, the city could not provide jobs and housing for all, leading many migrants to **camp out, planning to cross the border** with the help of smugglers known as **"coyotes"**. The border

between San Diego and Tijuana became a site of **frequent crossing attempts**, often ending **tragically**.

This situation led to the installation of **warning signs on the highway**. The sign's image was designed by graphic artist **John Hood**, who chose to depict **a father and daughter**, appealing to familial sentiments. As he stated:

"Los casos de éxodo masivo, especialmente con familias enteras presentaban un serio problema. Cuando se habla de familias, se habla de niños. Los estaban masacrando en las autopistas. Los niños no saben qué está pasando, ni por qué están ahí, o por qué sus padres actúan así. Solo saben que este no es su hogar. La señal transmite que están lejos de casa. Y los niños preguntan: '¿Por qué estamos corriendo?' Hoy, incluso cuando veo a padres caminando en centros comerciales con sus hijos, es como si los arrastraran. Esa era la idea: sujetar con fuerza algo que amamos profundamente." ²

(trans. 'Mass exodus cases, especially involving entire families, presented a serious problem. When it involves families, it involves children. They were being slaughtered on the highways. Children do not know what is happening, why they are there, or why their parents are acting in such a manner. They just know that this is not their home. The sign conveys that they are far from home. And children ask, 'Why are we running?' Even today, when I see parents walking in shopping malls with their children, it is as if they are dragging them. That was the idea: to hold tightly to something we deeply love.')

Pete Wilson, governor of California from 1991 to 1999, was a pivotal figure during this period. During his campaign for a second term, he made his conservative views and anti-immigrant sentiment a cornerstone of his platform. A key component of Wilson's campaign was **Proposition 187**, which aimed to **prohibit immigrants from accessing public services**.

Proposition 187 was approved by California voters in November 1994 but was immediately contested in court. By 1997, many of its provisions were **declared unconstitutional**. Nevertheless, the proposition significantly impacted the national debate on immigration and border control policies in the United States.

The passage of Proposition 187 left a **sense of betrayal**: on one side, there was the community of California voters who had supported the measure; on the other, the Hispanic community, which felt deeply scorned, mobilizing an unprecedented number of Californian Hispanics toward political activism. This shift contributed to transforming California from a **nominally Republican state to a Democratic one**, leading to a prolonged absence of elected Republican governors, with the exception of Arnold Schwarzenegger.

Despite Proposition 187 highlighting growing distrust between communities, the ties between law enforcement in San Diego and Tijuana remained strong. During the rest of the 1990s, **collaboration between law enforcement agencies in the two cities continued** and expanded, especially in combating the drug cartels rooted in Tijuana. This collaboration was also spurred by the Clinton administration, which in 1994 was prompted to launch **Operation Gatekeeper to enhance border security**. This controversial program, criticized by human rights activists, led to a significant **increase in resources for the Border Patrol**, including agents, fencing, physical barriers, and surveillance technologies.

Operation Gatekeeper aimed to **prevent illegal immigration through a constant and visible law enforcement** presence in key border areas. Additionally, its implementation required cooperation from security agencies on both sides of the border. Operation Gatekeeper **benefited from the collaborative climate**, receiving bipartisan support and operating with a steady annual budget of \$18 billion for years. Politically, the success of the operation defused much of the debate on illegal immigration during the 1996 presidential campaign. **Progress in border security had temporarily resolved the issue**, and surprisingly, during the debate held in October 1996 in San Diego, the topic of immigration and border security was not even discussed.

The collaboration gave rise to a series of cooperative measures on a local scale as well. A significant **turning point occurred** at a fire station near the small town of Campo, southeast of San Diego. For the first time, Mexican Consul General **Luis Herrera-Lasso officially met with U.S. officials** to discuss border security, marking the beginning of a new era of cooperation. The U.S. counterpart presiding over the meeting was Alan Bersin, whose role was to make Mexican representatives recognize the border crisis and its implications for the NAFTA agreement. The choice of **Campo** as the meeting site was not accidental: the area had been a scene of cross-border violence. Thanks to this and other

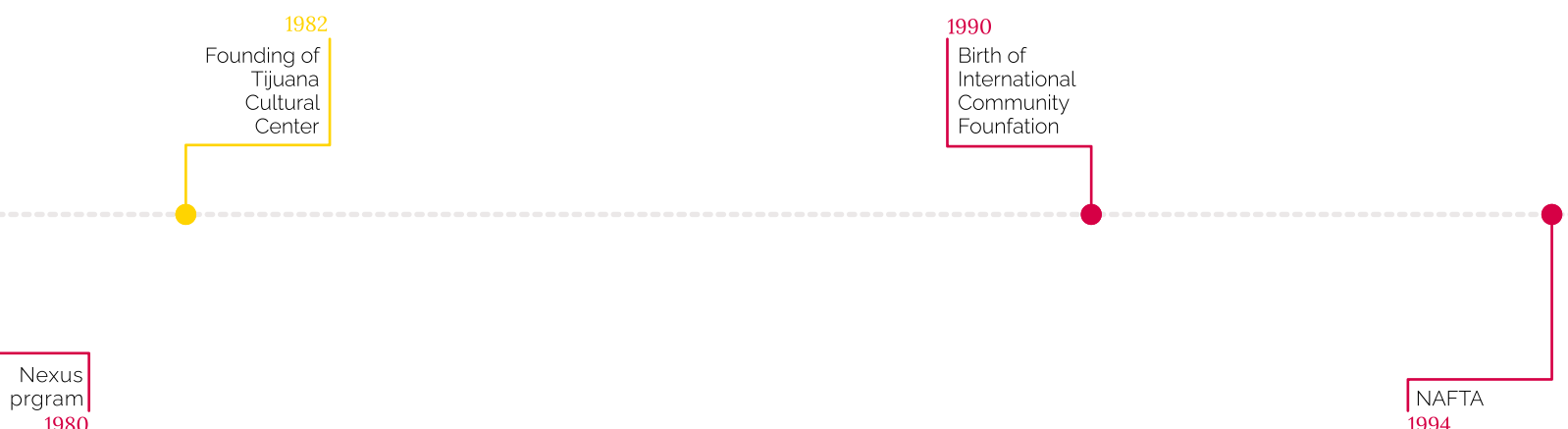
occasions, Bersin and Herrera-Lasso managed to establish a common approach to improving cross-border relations.

Despite past tensions, cooperation between law enforcement agencies began to become more evident, both professionally and, in some cases, personally. The economic crisis and escalating violence by drug cartels in Mexico made cooperation and support from U.S. officials urgent. This necessity culminated in **ongoing dialogue** between U.S. President Clinton and Mexican President Zedillo, **focused on border security and NAFTA**. Collaboration between authorities from both countries led to positive outcomes in managing migrant security, and joint efforts also fostered mutual trust.

Progress was multifaceted, from **anti-drug partnerships to migrant awareness campaigns**, to information sharing for dismantling trafficking networks. The cooperative spirit, however, **extended beyond mere border issues**. In 1997, during a fire near Tecate, firefighters from San Diego and Tijuana collaborated, ignoring cross-border protocols. Additionally, reports of **abuses against migrants by U.S. agents** led to the creation of a joint task force and the **first indictment of a border agent for civil rights violations**.

One of Operation Gatekeeper's objectives was to **combat drug cartels**. Contrary to popular belief, crime and cartel violence did not merely flow from central Mexico to the United States. In the 1990s, the **Arellano Félix drug cartel** emerged in Tijuana, becoming one of Mexico's largest and most violent criminal groups. This cartel recruited members on both sides of the border, including young aristocrats from Tijuana and members of U.S. **gangs like the Logan Heights gang in San Diego**, who were used as hitmen and bodyguards. The cartel's violence extended to rival cartel members, **civic leaders, and officials** from both **Mexico and the United States**, such as Assistant U.S. Attorney Gonzalo Curiel. This violence affected not only officials but also some civilians.

To address this crisis, **law enforcement agencies**



from both countries decided to collaborate secretly. The **joint task force**, led by Chuck LaBella and Samuel González, **involved federal agencies from both the U.S. and Mexico**. They **shared information and resources**, participating in coordinated surveillances and raids. This collaboration led to the deaths of violent cartel members and numerous convictions, **breaking the power of the Arellano Félix cartel**. Although the cartel and the Logan Heights gang resurfaced with new leadership, they never regained their former power thanks to the **continued cross-border law enforcement cooperation**.

Thanks to Operation Gatekeeper, San Diego **successfully managed migratory flows**. However, while authorities worked to slow down one type of border crossing, they **sought to accelerate another: legal crossings**. These included residents of San Diego and Tijuana, tourists, businesspeople, and commercial traffic frequently crossing the border in both directions.

The San Diego Dialogue study revealed that border wait times, long considered a minor issue, were actually **extremely costly in terms of lost productivity and negative economic impact on both cities** and their respective national economies. Consequently, to improve border efficiency, the city and county of San Diego, in collaboration with the federal government and private sector leaders, had to take initiative. Over the past 25 years, the San Diego-Tijuana border has transformed from a recognized embarrassment to an **international model of binational cooperation and efficiency**, thanks to the efforts of multiple institutional and individual actors on both sides of the border.

Following the pioneering efforts of the San Diego Dialogue, the **San Diego Association of Governments (SANDAG)** became crucial in addressing common **issues between San Diego and Tijuana**. Founded in 1966, SANDAG began as a small planning department in San Diego County and evolved into a key agency for **regional planning and growth**.

Over the years, SANDAG has **implemented**

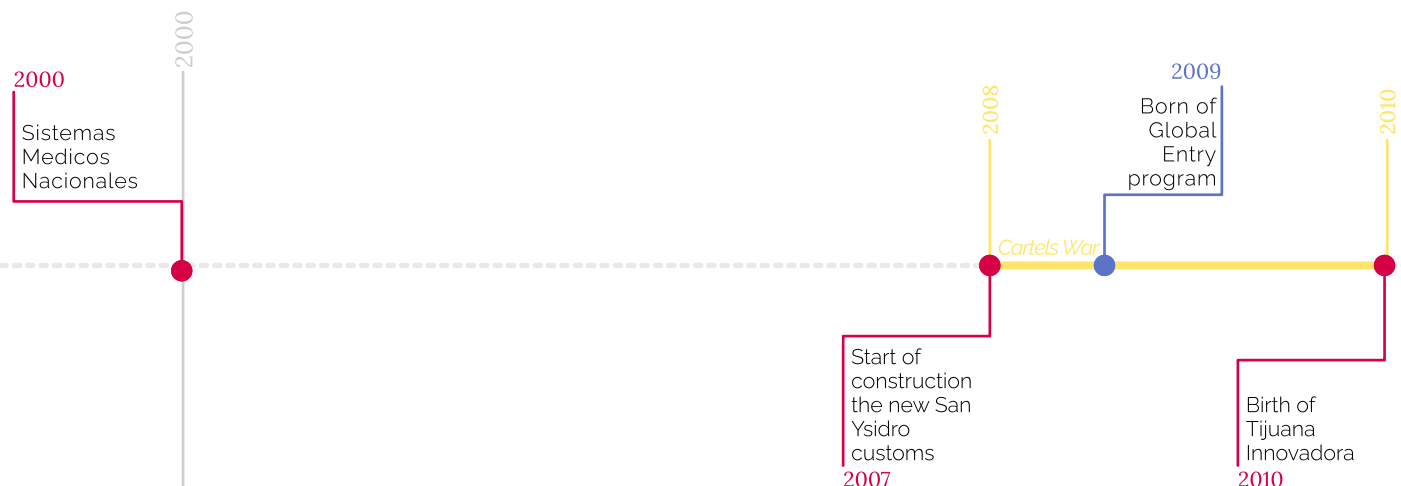
significant infrastructure projects, such as the regional transportation plan and the international wastewater treatment plant, and has worked to **enhance border efficiency**.

The relationship between SANDAG and the **Tijuana Municipal Planning Institute** is crucial for understanding the current dynamics of the border. This collaboration led to the **creation of a joint strategic plan for the Otay Mesa-Mesa de Otay binational corridor**. This innovative project involved stakeholders from both cities and included coordination between U.S. and Mexican customs to improve border crossings.

The binational relationship between SANDAG and the Mexican federal government was **formally recognized in 2018** with a visit from the Mexican Secretary of Foreign Affairs, marking a turning point in San Diego-Tijuana relations. These efforts demonstrate that **joint initiatives between border cities can generate significant economic and infrastructural progress**, benefiting both communities and their respective national economies.

After leaving the prosecutor's office, both Bersin and Sanders pursued new careers. **Sanders** became **Mayor of San Diego** and later **President of the Regional Chamber of Commerce**, while **Bersin** held roles in **education and national security**. His experience and political connections led him to high-level federal positions, including **Assistant Secretary for International Affairs and Special Representative for Border Affairs** at the U.S. Department of Homeland Security.

Bersin spearheaded the implementation of the **SENTRI program**, which **introduced dedicated lanes for pre-approved travelers** along the U.S.-Mexico border. This program significantly **reduced wait times at border crossings**, enhancing crossing efficiency and strengthening ties between the two nations. Additionally, his leadership **fostered the adoption of new technologies and procedures to bolster border security without compromising efficiency**. The success of the SENTRI program led to its expansion along the entire border,



demonstrating that security and ease of crossing can be reconciled.

However, following the **September 11 attacks**, the United States **faced an unprecedented challenge in managing security at border crossings**. The impact of this response was immediately felt in San Diego and Tijuana. Extended congestion and trade blockages underscored the need for **innovative solutions that balanced security and efficiency**. Alan Bersin and his team recognized that addressing this challenge required a new strategy that transcended the traditional approach of inspecting every passenger and vehicle. Instead, they **proposed focusing on identifying legitimate travelers, separating them from potential threats**. This approach, implemented through programs such as the **Trusted Traveler Program**, maintained a high level of security while reducing wait times at border crossings. This intervention was a precursor to other initiatives, such as the current **Global Entry program**, which have further improved border crossing efficiency.

The collaboration extended beyond passenger travel to **freight transport**. Programs like the Cargo Pre-Clearance Program and Unified Cargo Processing streamlined and **accelerated the movement of goods across the border**. These initiatives **significantly impacted the regional economy**, facilitating the flow of goods between the United States and Mexico.

In conclusion, Bersin's innovative approach and the success of the programs implemented in San Diego and Tijuana have **had a lasting impact**, transforming these border crossings **into models for other regions**.

San Diego's rapid development since the 1960s highlighted a fundamental weakness in its transportation system: **the airport**. As the city expanded and the road system was continuously upgraded, the airport **remained inadequate, causing congestion and logistical limitations**. The San Diego International Airport, despite ongoing updates, continued to be constrained by its single runway and lack of space for further

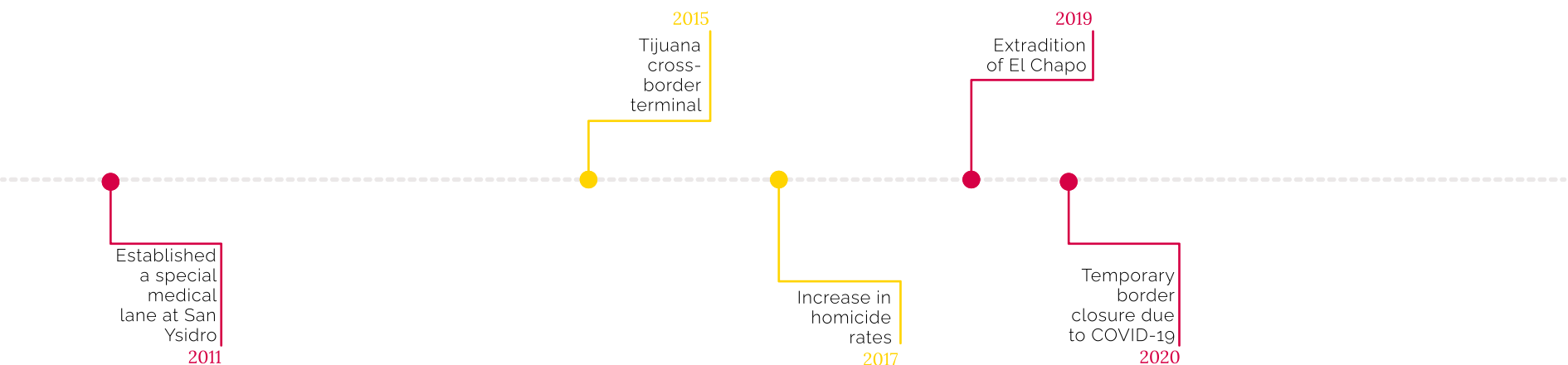
development. This situation contrasted with the **efficiency and expansion of Tijuana's airport**, which benefited from better infrastructural planning.

The solution to air congestion was found in the innovative **CBX project, the first cross-border bridge to charge a toll for crossing the border**. This project, funded by private investors and jointly managed by both nations, demonstrated that **public-private partnerships can effectively overcome infrastructural challenges**, even in border situations.

A key figure in the **realization of CBX and the promotion of cross-border cooperation** was **Carlos Bustamante**, Mayor of Tijuana. His leadership and vision made the project possible and inspired other efforts to improve transportation in the region.

Despite successes in air and land transport, the lack of a significant railway network remains a challenge for San Diego and Tijuana. Attempts to **build a cross-border railway** have faced **political, logistical, and geographical obstacles**, but there are hopes that projects like the Desert Line may one day become a reality.

Since 2020, there have been significant developments regarding the **Desert Line**, also known as the **"impossible railway"**. Baja California Railroad (BJRR) and Pacific Imperial Railroad (PIR) reached a **historic agreement to finance and manage the construction**. The agreement, approved by the San Diego Metropolitan Transit System (MTS), stipulates that BJRR and PIR cover the estimated costs of \$60 to \$70 million. Construction, **which began in the summer of 2020, aims to reduce road congestion at border crossings, improve air quality, and stimulate economic activity in the Cali-Baja region.** ^{9 10}



the road ahead

San Ysidro, the primary port of entry between the cities of San Diego and Tijuana, was **completed in 2018** with an investment of \$741 million. This port of entry already included **pedestrian lanes** on both the west and east sides of the vehicle lanes, which **incorporate the Global Entry program** for trusted travelers. Among these trusted travelers are those who repeatedly cross the border for shopping. This phenomenon, seemingly trivial, has created a **unique cultural blend in the border region**.

The forty-minute journey from Tijuana to the **Americas Premium Outlets** shopping mall does not deter those wishing to shop in the United States. Shoppers often perceive advantages not only in the **quality of products** but also in the **prices at which they are sold**.

Thanks to various public and private programs of the twenty-first century, the **border increasingly became a natural extension of the city itself**, transforming the border crossing into merely a **congested traffic route**. Initially, this binational experience was reserved for the affluent, but it soon became part of **everyday life for everyone**. Mexicans were attracted to the well-paying jobs in San Diego, while Americans **found better infrastructure** in Tijuana.¹¹

This **blending of cultures** has produced previously **improbable situations**: the governor of Baja California lived in Chula Vista, while Californian doctors worked in Tijuana. **Students crossed the border daily** to attend colleges. The number of residents crossing the border grew enormously, with nearly 70,000 cars and 32 million pedestrians annually passing through the San Ysidro port of entry.

Malin Burnham, a prominent figure born in San Diego, significantly impacted the cities of San Diego and Tijuana throughout the twentieth century. With a degree in industrial engineering from Stanford, Burnham became the CEO of his family business at just 32. His **passion for sailing** led him to win the Star World Championship at 17 and to lead the U.S. team to victory in the 1987 and 1988 America's Cup, cementing the reputation of the San Diego Yacht Club.

However, it is in **philanthropy** that Burnham has left an indelible mark, retiring from business in 1981 to fully dedicate himself to **non-profit causes**. He played a crucial role in founding the **Sanford Burnham Prebys Medical Discovery Institute**, positioning San Diego as a global leader in stem cell research. Burnham also championed numerous **community projects**, including saving the **Padres baseball team** and converting an **aircraft carrier into a museum**. His vision extended beyond borders, improving relations between San Diego and Tijuana through **initiatives** like the **"San Diego Dialogue"** and the **"Smart Border Coalition."**

Salomón Cohen, often compared to Malin Burnham, moved to Tijuana at 17 and began his career working in his father's fabric store. After his father's untimely death, Cohen revealed a **natural talent for retail** and in 1959 helped found Tijuana's first department store, **Dorian's**. Over half a century, Dorian's and other stores in the chain thrived, making him one of Baja California's most influential entrepreneurs. In 2005, after building an empire of 70 stores, Cohen decided to sell his main business but **remained involved in urban development**, such as the new **World Trade Center in Tijuana**.

In the last 15 years, Cohen has dedicated his life to **philanthropy**, supporting numerous cultural and educational programs. Along with his late wife Maria, he brought the **San Diego Mozart Festival to Tijuana** and created school choirs involving a thousand students. Cohen played a crucial role in promoting dialogue and cooperation between the business communities of Tijuana and San Diego, remaining involved in the **Smart Border Coalition**.

As repeatedly noted in this thesis, Tijuana's history has been characterized by its **dependence on the needs of Americans**, particularly those from San Diego, **offering services that were not available legally or illegally in the United States**. Despite the maquiladoras improving the economy and employment, Tijuana sought something it could do better than San Diego.

A remarkable story is that of **Dr. Elizabeth Jones**, a Canadian who moved to San Diego and then began volunteering at a small pediatric clinic in Tijuana. Dr. Jones introduced **innovative techniques** such as **kangaroo care for newborns**, becoming a key figure in child health in Tijuana. Despite the clinic's closure, Jones and **Dr. Gabriel Chong King** created a **new clinic** thanks to donations and international support.

The new medical center, opened in 2000, became a **successful model**, treating thousands of patients with a reduced annual budget and providing free or low-cost care to many. By 2017, the hospital had treated 500,000 children and continued to expand its services with the support of American, Canadian, and Mexican sponsors. Dr. Jones, **awarded for her contribution**, demonstrated that Tijuana can be a place of **medical excellence and innovation**, paving the way for a more independent and admired future.

Few, however, could have predicted Tijuana's transformation into a **world leader in medical tourism and medical supplies**. Before Dr. Jones' pediatric hospital, **Tijuana was known for offering health services unavailable** in the United States, such as narcotics and banned surgical procedures. The revolution in

Tijuana's healthcare sector occurred with the health plan of **Sistemas Medicos Nacionales (SIMNSA)**, founded by **Francisco Carrillo** in 2000. Carrillo managed to get SIMNSA **certified to operate according to U.S. medical standards**, allowing access to the California market. This created opportunities for other Mexican companies to enter the U.S. healthcare market. SIMNSA's service quality pleasantly surprised U.S. patients, thanks to the Mexican tradition of hospitality, which offered a **highly appreciated level of care and personalized attention**. This transformed Tijuana into a global leader in healthcare, significantly impacting the **local economy and the city's reputation** in the medical sector. Between 2014 and 2018, the number of **medical tourists in Tijuana tripled**, from 800,000 to 2.4 million. To facilitate border crossing, Mexico **established a special medical lane at the San Ysidro port of entry** in 2011.

Initially intended only for patients, **the lane also became popular among other tourists**, leading to an increase in the use of medical passes. In 2018, Tijuana's Secretary for Economic Development, Arturo Perez, reported that 288,000 passes had been issued, **90% for medical reasons**. This system improved border crossing efficiency, although the fast lane was still quicker than regular lanes.

Medical tourism **has had positive economic** spillovers throughout the region. Baja California benefited from additional revenues of \$785 million. The medical complex of the **Grand Tijuana Hotel**, managed by **Adrian Bustamante**, is an example, with hotel rooms converted into recovery suites for patients. The **medical tourism** industry has evolved into various market niches. Some hospitals offer savings of 40 to 65% compared to U.S. prices, while others, such as the Angelus Hospital, inaugurated in 2006, cater to high-end clients **with luxury services**.

The development of Tijuana's medical district near the San Ysidro port of entry includes skyscrapers like the **New City Medical Plaza**, with medical facilities and hotels for recovering patients. This complex represents the future of medical tourism in Tijuana, a city within a city **just a few meters from the U.S. border**.

The arrival of **low-cost international telephony** in Tijuana gave rise to a thriving call center sector, attracted by the low-cost labor, access to a modern telephone network, and the growing English-speaking population of Tijuana. These **call centers**, perfect for U.S. business needs, **grew rapidly**, with more than 60 centers operating. An example of these call centers is Alipio, founded by two brothers who grew the company to 60 employees. Surprised by the **quality of local labor**, the brothers noted that many employees were **Mexican citizens** who had lived in the United States, **spoke English with an American accent**, and had a deep understanding of American culture. These employees, despite the challenges of adapting to Mexico, proved to be a valuable resource for the call centers. Their familiarity with American culture allowed them to establish an immediate connection with U.S. customers, **increasing levels of trust and comfort during calls**. Alipio imported American corporate culture into its offices, providing employees with a comfortable environment and celebrating American holidays. This approach **contributed to the company's success**, which continues to grow despite competition from other call centers in Tijuana.

Taylor Guitars, a world leader in the design and production of acoustic guitars, represents one of the **most successful examples of the maquiladora industry**. The maquiladora industry includes more than 3,000 companies and employs **over a million Mexican workers**. These companies, many of which are international, have a significant impact on the Mexican economy and trade with the United States. With the continued development of the maquiladora industry, the **U.S.-Mexico border remains a place of opportunity and innovation** in the manufacturing sector.

One of Taylor's most famous innovations was the creation of the patented guitar neck, considered the **first major innovation** in the sector in a century. This helped solidify Taylor's reputation as one of the most innovative designers in the industry. However, Taylor faced the challenge of **U.S. consumer perception** regarding **Mexican-made products**. Despite the maquiladora industry's growth opportunities, products made in Mexico were still **considered inferior in quality**.

Taylor sought to **overcome this stigma by maintaining high standards of quality** and innovation while leveraging automated production technology to keep costs competitive. **Taylor's Academy line**, produced at the **new factory in Tecate**, exemplifies how the company adopted advanced technologies to offer high-quality guitars at competitive prices. Although they **use cheaper components**, the Academy line guitars maintain Taylor's design and construction standards, demonstrating that innovation and affordability can be reconciled.

Between the 1960s and the 1990s, the relationship between San Diego and Tijuana experienced great growth and brought **considerable profits**.

guerra contra los cárteles

The cartel war in Tijuana reached a critical point in 2008, when **17 cartel members were killed** in a single shootout. This event marked the beginning of unprecedented violence in the city, with hundreds of people killed in the early months of 2008. The situation became so dire that **many residents sought refuge in San Diego** and other cities. Consequently, the violence and instability caused by the cartel war severely tested the relationship between San Diego and Tijuana. However, **both cities recognized the importance of collaborating to address these challenges and ensure the security and prosperity of the region.**

Despite the difficulties, the relationship between San Diego and Tijuana has stood the test of time. The two cities continue to **collaborate in various sectors**, including **trade, tourism, and security**, demonstrating that together they can overcome even the most challenging obstacles.

In 1994, **Sandra Dibble** moved to Tijuana to work in the San Diego Tribune office, eager to immerse herself in a new culture and write about it. Although she had planned to live in Tijuana rather than commute from San Diego, she did not expect the city to soon be rocked by violence. Initially, **she focused on cultural and positive stories**; however, following the events of 2006, she **left her job and the agency closed**, leaving her as the sole international correspondent. In that year, violence surged again, with a wave of **kidnappings shaking the city**. In response, Mexican President **Felipe Calderon** ordered the deployment of federal troops to Baja California in early 2007. Despite the challenges, Dibble strived to **find meaningful stories** that helped readers understand the situation in Tijuana and **the resilience of its citizens.**

Businesses in Tijuana **suffered a severe blow**, especially in the **tourism and medical services** sectors, with the economy slipping into a recession. But the **greatest impact** was on families, **especially children**. Their lives were severely restricted: they could not visit friends' homes, go to school, or to the store alone, neither during the day nor at night. Parents locked them indoors, sometimes **barricading themselves inside**, and when gunfire intensified, they prayed to see the next morning. **Alfredo Angeles**, now a business development specialist, experienced this period as a seventeen-year-old, describing it as **a scar on the city.**

An individual who had a **significant impact** on his community was **Hugo Torres**, known for separating the Municipality of **Playas de Rosarito** from Tijuana and for his role in fighting criminal gangs. After inheriting his aunt's hotel, he worked tirelessly to **promote the city's growth**, also becoming mayor and

tackling police corruption and organized crime. Despite death threats and challenges, Torres **continued to fight for the security** and development of Rosarito. Thanks to his efforts, the city **overcame the most difficult period** and saw a **return of tourists and economic recovery**. Although some criticized his methods as authoritarian, many citizens look back with gratitude to Torres' years as mayor, recognizing his role in restoring the city to its former glory. Today, Rosarito is a city of over 70,000 people, with Torres' hotel continuing to thrive as one of the main economic engines of the region.

In 2010, Tijuana's **nightmare seemed to finally come to an end**, but the precise reasons for this sudden end remain controversial. Some attribute the credit to newly elected Mayor **Carlos Bustamante** of the PRI or to his predecessor **Jorge Ramos Hernandez** of the PAN, whose administrations had dealt with the cartel war.

The **end of the violence** in 2010 was so abrupt that it led to various speculations. Whatever the true story, the arrest of **Teo Simmental** in January 2010 marked the end of the Tijuana cartel war, with surviving members of his gang seeking refuge elsewhere. Thanks to the army, police, citizens, and brave journalists like those from Zeta, the city **slowly rebuilt its life**. **Nightlife** returned, **families** resumed visits to parks, and **teenagers** reaffirmed their social lives.



Caesar's Cafè (n.d.).
from Classic San Diego

culinary-driven revolution

After the dark years of the cartel war, Tijuana experienced a **true renaissance**, mainly due to the **culinary revolution**, which would become one of the main reasons for the tourist resurgence. This revolution began in 2012, while the **economy of Southern California**, particularly San Diego, **was booming**, and **local food bloggers began venturing into Tijuana** to celebrate its burgeoning culinary scene.

These new visitors, more interested in **health and culinary experience than hedonism**, found in Tijuana a place for culinary experimentation. **Food bloggers and amateur critics** started exploring the city for new culinary experiences, driven by the competition to offer **unique content to their readers**. This attention led to the discovery of a **new generation of chefs** in Tijuana, **blending indigenous and traditional ingredients with innovative techniques**. This phenomenon transformed Tijuana into a destination for food lovers, revealing a cuisine that goes beyond the **famous Caesar salad**, globally renowned but originating in Tijuana.

Bloggers discovered **Javier Plascencia**, a scion of a well-known restaurateur family. Growing up between Tijuana and San Diego, Javier worked in the **family restaurant in San Diego**, but his heart always remained tied to **Tijuana's markets and carne asada tacos**. With the onset of the cartel war in 2008, the Plascencia family moved north, but **returned to Tijuana in 2010, purchasing the iconic Caesar's restaurant**.

Founded in 1923, Caesar's, known for inventing the Caesar salad, had **lost its reputation**. The Plascencia family **restored the restaurant**, also contributing to the revival of Avenida Revolución, which was in decline. This restoration brought a new wave of **customers and culinary critics** to rediscover the restaurant and **Tijuana's cuisine**.

In the following years, Javier opened several restaurants, using **local ingredients and offering an innovative menu**. Most of these restaurants enjoyed considerable success and attention from the press. Plascencia's revolutionary cuisine sparked a **cultural flourishing in Tijuana**, helping to transform the city into a **culinary destination**.

Tijuana's resurgence no longer **depended only on American tourists** but on the **growing local middle class**. Avenida Revolución, once dependent on tourists, now primarily caters to Tijuana residents, marking a new era of prosperity and culinary culture.

Tijuana's resurgence was also supported by **high-quality food trucks**, which turned street food into an art form. However, this **culinary revolution-driven renaissance** did not stop at food. Young brewers from San Diego and Tijuana began creating **regionally and internationally famous craft beers**, with names like **Ballast Point, Mission Brewery, Karl Strauss** in San

Diego, and **Border Psycho, Cervceria Insurgente, Cerveza Norte, Cervceria Tijuana, and Mammut Brewery** in Tijuana.

In the second decade of the 21st century, Tijuana and San Diego enjoyed **relative peace and prosperity**, with San Diego experiencing an unprecedented **economic boom**. This fostered the explosion of **binational cultural, educational, and sports programs**, which had stalled since the 1990s.

One of the **pioneering events** was the Inter Program, organized in the mid-1990s by Michael Krichman and colleagues from Mexico City, featuring works by contemporary **Mexican and American artists** integrated at the border. Currently, one million visitors annually visit the **Tijuana Cultural Center (CECUT)** in the Rio area, which houses the INAX Theater, museums, shops, and numerous public events.

Sport is another area of collaboration. Tijuana children attend **San Diego Padres games**. Tijuana's basketball team, **Zonkeys**, included American players and had loyal fans on both sides of the border. San Diego **residents often travel south** of the border for **Mexican sports events such as bullfighting, wrestling, and soccer**.

Tijuana's colleges and universities collaborate with San Diego institutions, **offering cross-border academic opportunities**. This collaborative environment has educated residents about the **benefits of cooperation**, making the region an example of cultural and economic integration. Nearly all major higher education institutions in San Diego and Tijuana have research institutes focused on cross-border relations. The **California State University** system operates **Nexus**, founded in 1980, promoting binational research, **faculty exchange, and dual-degree programs in collaboration with Mexican universities**. The University of California has a Center for U.S.-Mexico Studies on its UC San Diego campus.

Tijuana still lags behind **San Diego in philanthropy**. San Diego benefits from the generosity of figures like **Malin Burnham**, who have significantly contributed to the **city's urban development**. San Diego's philanthropic tradition is fueled by multiple generations of wealth, federal tax incentives, and an entrepreneurial culture that **encourages donations**. Conversely, **Tijuana has less philanthropic tradition**, complicated by a Mexican culture that **historically valued social stratification over charity**. However, the increase in cross-border interactions has begun to change this dynamic, with **influential figures from San Diego extending their philanthropic efforts to Tijuana**.

A key institution in this process is the **International Community Foundation (ICF)**,

dedicated to promoting **international donations**, particularly towards Northwest Mexico, **aims to strengthen civil society** and **promote sustainable communities**.

Additionally, **philanthropists and institutions on both sides of the border** have formed the United States-Mexico Border Philanthropy Partnership (BPP), aiming to instill in the **next generation of privileged Tijuana residents** the importance of solidarity and contributing to various causes. According to **José B. Fimbres**, whose family has long supported CETYS, it is likely that San Diego **will serve as a catalyst to develop a stronger philanthropic culture in Tijuana**.

Despite this period being characterized by significant changes for the city, not everything always went smoothly. 2010 began with a **magnitude 7.2 earthquake**, centered in Mexicali, causing **blackouts on both sides of the border**. In 2010, Tijuana surpassed San Diego in terms of population, reaching 1.4 million inhabitants compared to San Diego's 1.3 million. By 2019, Tijuana had over two million inhabitants, while San Diego reached 1.5 million. San Diego maintained its **economic supremacy**, with a per capita income exceeding \$80,000, while Tijuana had a median salary of \$37,000. However, Tijuana was **quickly recovering thanks to industries like maquiladoras, medical tourism, and the large number of residents working in San Diego**.

These advances were quite significant; however, between 2015 and 2020, Tijuana faced **new challenges related to crime** and illegal immigration. After a mid-decade truce, the crime rate increased again. The Sinaloa cartel, entering a power vacuum, intensified violence, especially in the city's poor outskirts. In 2017, the **homicide rate in Tijuana increased drastically**. The situation was complicated by the existence of a single dominant cartel, **Sinaloa**, which clashed with the **Jalisco Nueva Generación cartel**. In 2018, Tijuana was declared the city with the highest homicide rate in the world, with 138 homicides per 100,000 inhabitants and over 2,500 homicides in total, a 40% increase from the previous year.

Despite these problems, the central areas of Tijuana, frequented by the middle and upper classes, **remained vibrant and safe, contributing to an image of growth and dynamism** that contrasted with the violence in the outskirts.

By the end of 2019, the situation in Tijuana and Mexico deteriorated significantly. In February, Joaquín **"El Chapo"** Guzmán Loera, the head of the Sinaloa cartel, was **extradited to the United States**, tried, and sentenced to life in prison. This conviction, considered a turning point in the war on drugs, triggered a wave of violence in Mexico as the Sinaloa cartel reorganized under the leadership of Guzmán's sons, known as **"Los Chapitos"**, and his former aide, Ismael Zambada.

The **peace strategy** of the new Mexican president, **Andrés Manuel López Obrador**, which included **amnesty for non-violent individuals involved in drug trafficking**, was tested when the National Guard captured **Ovidio Guzmán López**, one of El Chapo's sons. However, the Sinaloa cartel responded with a **large-scale attack in Culiacán**, forcing the government to **release Guzmán López** and demonstrating its **ability to directly challenge the state**.

Cartel violence continued to escalate, culminating in a massacre in the village of La Mora, where members of a Mormon community **were killed** by an armed arm of the **Juárez cartel**. This event sparked outrage in the United States and led **President Trump to consider Mexican drug cartels as terrorist organizations**.

In 2010, during a period marked by cartel violence, **José Gallicot** launched **"Tijuana Innovadora"**, a biennial event that brought together **celebrities, world leaders, and innovators to discuss the city's future and showcase the latest technologies**. The first edition featured personalities such as **Larry King, Jimmy Wales, Al Gore, and Carlos Slim**, culminating in a street dance involving 16,000 people. This event was a great success, marking a turning point in Tijuana's image.

"Tijuana Innovadora" **grew over time**, including a wide range of programs embracing business and cultural aspects of the city, such as fashion, art, and technology. In 2018, the event directly engaged more than 100,000 people and indirectly over 400,000, with overall beneficiaries exceeding two million. Gallicot also **formed a binational advisory board with influential members** from San Diego, further elevating the event's profile and strengthening ties between the two cities. Tijuana Innovadora became a **symbol of hope and rebirth**, helping to change the **global perception of Tijuana as an innovative and dynamic city**.

Omar Martinez.
Hundreds of people watch from the border fence in Playas de Tijuana, Mexico(2022). from Picture Alliance via Getty Images



the migration crisis

An important aspect to highlight during this historical period is the **influx of irregular and undocumented migrants** into the United States, which has undergone significant changes over time. The number of migrants, particularly from Mexico, has **decreased considerably compared to the past**. The cities of Tijuana and San Diego have managed to **control illegal crossings since the 1990s**, shifting the migratory flow to more **isolated regions** such as the **Sonoran Desert** and, since 2011, to the **Rio Grande region** in Texas. These areas, in fact, remained rather difficult to **control** despite the increase in **Border Patrol agents**.

Migrants often rely on **"coyotes"** to cross the border, facing deadly dangers such as **extreme temperatures and inhumane travel conditions**, which in the worst cases **lead to death**. The United States has always faced a **moral dilemma regarding illegal immigration**. On one hand, the country needs **new workers** and immigrants **contribute significantly to the economy**. On the other hand, many Americans view illegal immigration as an abuse of national generosity, especially compared to legal immigrants who have to endure long waits to enter the country.

The **rhetoric on immigration** has **been politicized**, leading to restrictive legislation and deportations. Between the 1990s and 2000s, **border control became stricter**, especially after September 11, 2001, when there was increased fear that terrorists could enter through the Mexican border.

Demographic studies have **estimated that there are approximately 11 million unauthorized immigrants** in the United States, of which about 8 million are from Mexico. However, over time, the migratory flow has changed, with an **increase in migrants from the Northern Triangle of Central America (Guatemala, Honduras, and El Salvador)**, fleeing extreme poverty and gang violence. In 2018-2019, caravans of thousands of migrants sought to enter the United States, **challenging the asylum system**. These migrants were turned away and forced to wait in Mexico for asylum

hearings, **creating further tensions between the two border states**.

Finally, Trump's 2016 presidential campaign **emphasized the construction of a border wall**, creating additional political divisions not only between the two bordering states but also within the United States itself. Although **the flow of migrants from Mexico has decreased**, immigration management remains a complex and divisive issue, **influenced by economic, demographic, and political factors** on both sides of the border.

Construction of the wall continued even during the **Covid-19 pandemic**, with some interruption due to the health emergency. That period, however, is remembered for the **abrupt change in relations between the two border cities, San Diego and Tijuana**.

*"On March 19th California's government ordered the state's 42m residents to stay home to slow the spread of the new coronavirus. The next day Donald Trump, the American president, announced that the United States-Mexico border would be closed to all but "essential" traffic."*¹²

These restrictions, and the security measures attached to them, resulted in a **substantial change** not only on the border, but also in the **ways of living in the cities themselves**. San Diego had turned into a ghost town, while in Tijuana, life continued to flow quietly.

During the 2021 presidential campaign, in response to President Trump's **anti-immigration policies**, Democrat Biden promised to **"restore humanity and American values to our immigration system."**¹³ However, initiatives promoted by the eventual election winner clashed with Capitol Hill decisions, preventing a real reform of immigration policies. The **issue remains contentious**, to the extent that it will likely become one of the hot topics of the **2024 presidential campaign**.¹⁴



legend

- San Diego
- Tijuana
- California
- Baja California
- Border
- Green areas
- Rivers and lakes

4.3

morphology & mobility

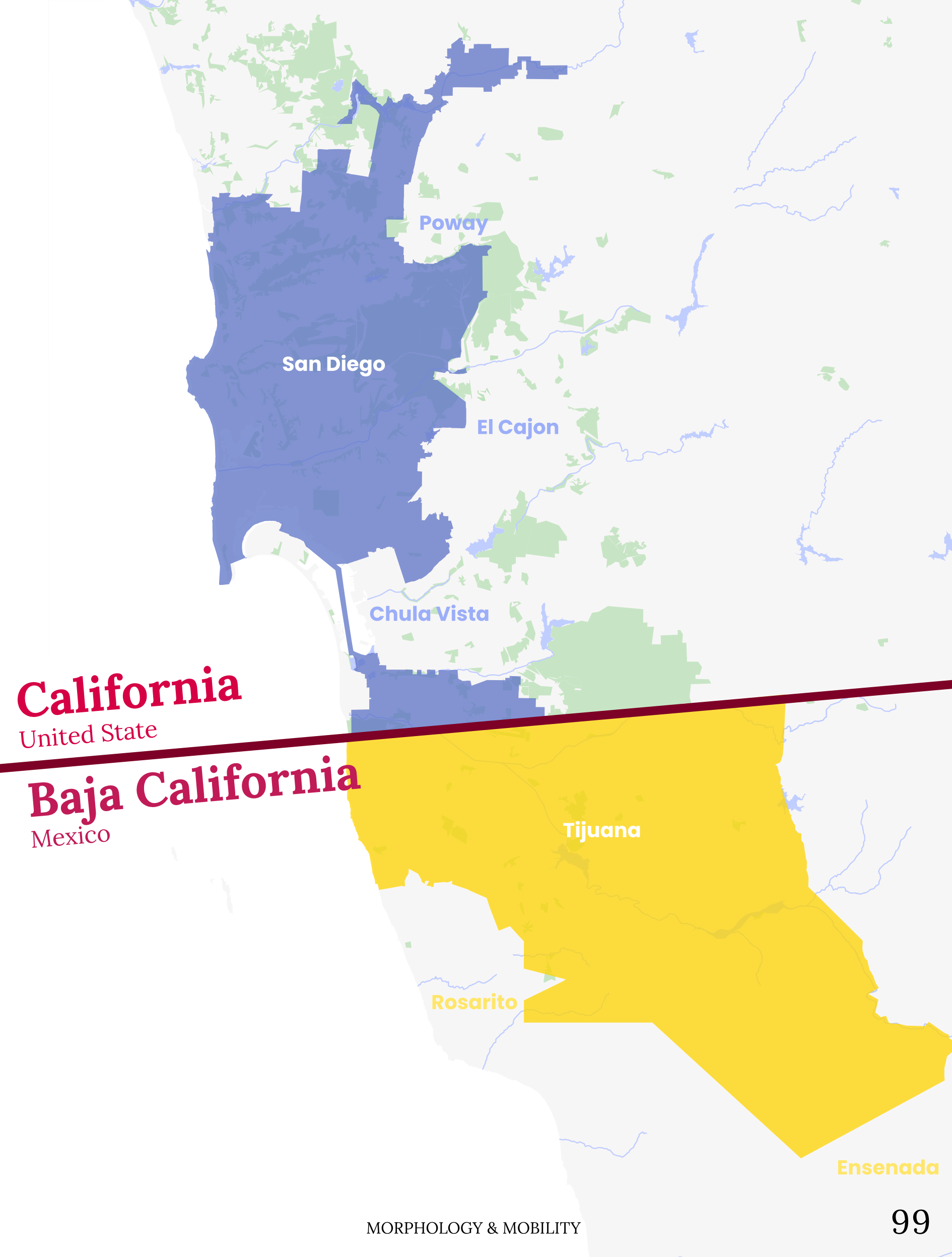
The San Diego-Tijuana cross-border region **spans two nations**: the United States and Mexico.

San Diego, encompassing an area of **8,870.71 km²**, is situated in San Diego County, in the **southwestern part of California**. The city is located on the Pacific Ocean, extending from its extensive eastern coastline, which is renowned for its **beaches and marine reserves**, to the mountainous regions in the west, which feature a variety of natural landscapes. The **San Diego** and **Tijuana Rivers** traverse the city.¹⁵

Notably, the **Tijuana River Estuary**, a **protected natural reserve**, is situated in San Diego, flowing through Tijuana before emptying into the **Pacific Ocean**.¹⁶ San Diego is bordered by Escondido to the north, **Poway** to the northeast, **Santee** to the east, **Chula Vista** to the southeast, and the **Mexican city of Tijuana** to the south.¹⁵

Across the physical barrier delineating the international boundary, **Tijuana** is located in the northwestern region of **Baja California**.¹⁷ The city, which developed from initial settlements along the **Tijuana River**, now spans **1,239.49 km²**.¹⁷ Tijuana has a brief **coastline along the Pacific Ocean** to the west, borders **San Diego** to the north, **Tecate** to the east, and **Playas de Rosarito** and **Ensenada** to the south.¹⁷





California

United State

Baja California

Mexico

Tijuana

Rosarito

Ensenada

legend

San Diego Tijuana
Military Industrial
Farmland Orchard Landfill

The conducted research reveals **distinct patterns** of land use between the two cities within the region.

In San Diego, land is predominantly **allocated for military purposes**, reflecting its historical role as a crucial national military site. The city hosts several significant military installations, including the **Point Loma and Coronado naval bases**, the **Marine Corps Recruit Depot**, the **Marine Corps Air Station Miramar**, and the **Coast Guard Sector/Air Station San Diego**.¹⁸ Additionally, it accommodates various National Guard and reserve centers for different branches of the armed services.¹⁸

Industrial activities in San Diego are primarily situated in the **Miramar** area, known for its industrial parks,¹⁹ and **along the border with Tijuana**, which on the contrary, has more land use dedicated to industrial areas. **Agricultural land** within San Diego, as well as in Tijuana, is minimal, with **most farming activities occurring outside the urban boundaries**.

The San Diego-Tijuana transborder region is strategically connected to the global transportation network through two prominent international airports: **Tijuana International Airport**²⁰ and **San Diego International Airport**.²¹ These airports support a wide range of national and international airlines, facilitating significant passenger and **freight traffic**.

In addition to these international hubs, San Diego is served by **two general aviation airports**: Montgomery-Gibbs Executive Airport²² and Brown Field Municipal Airport.²³ These facilities cater to the **needs of public and private entities**, including private aircraft, corporate jets, charter services, air ambulances, law enforcement, firefighting operations, flight training, and cargo transport.²²

The region is underpinned by **robust infrastructure that ensures seamless connectivity** within and beyond the states of California and Baja California.



Cross-border Express (n.d.).
from Visit California



San Ysidro by night (March 9, 2024).
made by the authors



San Ysidro Pedestrian Crossing (April 11, 2024).
made by the authors



The trolley wrap for WDC (2024).
from Cool San Diego Sights!

Critical **highways** and interstates traverse both cities, notably including the **Historic State Route 163**²⁴ in San Diego and **Interstate 5**, which transitions into **Mexico Federal Highway 1** upon crossing the border.²⁵

Public transportation in both cities is comprehensive. San Diego's system, managed by the San Diego **Metropolitan Transit System (MTS)**, operates approximately 100 bus routes covering local, urban, and rural areas,²⁶ complemented by the light rail system known as the **Trolley**, which includes the **UC San Diego Blue, Orange, and Sycuan Green lines**.²⁷ In Tijuana, the **Sistema Integral de Transporte de Tijuana (SITT)** manages **22 bus routes**, providing essential transit services across the city.²⁸

Both cities are also **invested in promoting sustainable transportation**. The combined network of **bike paths totals approximately 2,910 km**, with San Diego contributing 2,897 km²⁹ and Tijuana adding 13 km.³⁰ These bike paths support zero-emission travel and enhance **intra-city mobility**, reflecting a commitment to environmental sustainability and **reducing urban traffic congestion**.

Although the two cities are culturally and spatially interconnected, the region is divided by the imposing **physical barrier** that runs along the border between the two countries, which **people regularly cross daily from one side to the other**.

Tijuana hosts **five ports of entry**, two of which are shared with San Diego: the **San Ysidro port of entry** and the **Cross Border Xpress (CBX)**, a binational pedestrian bridge that directly connects Tijuana International Airport with San Diego.³¹

The San Ysidro port of entry is the **most heavily trafficked crossing** along the **entire border**, with an average daily influx of approximately 50,000 vehicles and 25,000 pedestrians heading north.³² It is well-integrated with San Diego, as the **UC San Diego Blue Line** of the Trolley terminates directly at the pedestrian crossing, facilitating pedestrian movement.

Given that the San Ysidro port of entry is not only the busiest crossing on the border but also the **most traversed in the world**, the considerable volume of vehicles passing through daily exerts a **significant environmental impact**, particularly through air pollution.³³

Designated as a **"blurred" boundary**, the region sees its inhabitants engaging in a **daily practice known as trans-migration**, where crossing the border is a routine activity.³⁴ Residents frequently move northward for **employment and educational opportunities**, but these are not the sole reasons.

Adjacent to the San Ysidro port of entry is the **Las Americas Premium Outlets**, a shopping destination that attracts individuals from both San Diego and Tijuana, prompting them to traverse the border **for shopping purposes**.³⁵

“Sofía, de 19 años, nació y creció en Tijuana. [...] Hoy ha cruzado a San Diego para hacer algunas compras. ‘Cruzo la frontera unas tres o cuatro veces al año’, dice en español. ‘Una vez en Navidad, una vez en enero, y una o dos veces en verano. Cuando vengo, compro en Las Américas, porque está cerca de la frontera. No tengo carro, y tengo que cruzar la frontera caminando’. ‘En todas las tiendas son muy amables, y te hacen sentir bienvenido. A veces tienen gente que habla español o inglés, lo que es bueno porque yo solo puedo hablar un poco de inglés. Muchas veces empiezo hablando en español y termino en inglés’. Aparte de sus viajes de compras, Sofía tiene poca conexión con la vida del lado estadounidense de la frontera, aunque añade que tendría más si hubiera una forma más fácil de cruzar. [...] ¿Influye la política en su decisión de cruzar o no la frontera? ‘No’, dice, negando con la cabeza. ‘Es mi propia decisión. Es personal’.”²

(trans. ‘Sofía, 19, was born and raised in Tijuana. [...] Today she crossed to San Diego to do some shopping. ‘I cross the border about three or four times a year,’ she says in Spanish. ‘Once at Christmas, once in January, and once or twice in the summer. When I come, I shop in Las Americas, because it’s close to the border. I don’t have a car, and I have to walk across the border.’ ‘In all the stores they are very friendly, and they make you feel welcome. Sometimes they have people who speak Spanish or English, which is good because I can only speak a little English. A lot of times I start out speaking Spanish and end up speaking English.’ Aside from her shopping trips, Sofía has little connection to life on the U.S. side of the border, although she adds that she would have more if there were an easier way to cross. [...] Does politics influence her decision whether or not to cross the border? ‘No,’ he says, shaking his head. ‘It’s my own decision. It’s personal.’)

Conversely, the **southward movement** across the border facilitates the arrival of **tourists and patients**, as Tijuana is recognized as a global leader in **medical tourism and healthcare provision**. Among those heading south are bankers, lawyers, and business professionals from San Diego, along with retired U.S. military personnel who own vacation homes near Playas de Rosarito, and culinary enthusiasts traveling to Baja California to experience its renowned cuisine or visit Valle de Guadalupe for its distinguished wine tasting.²

“Cindy, de 24 años, vive en Imperial Beach, no lejos de la frontera. Cruza la frontera hacia Tijuana cada una o dos semanas, sobre todo para aprovechar la atención médica costeable que hay allí. [...] ‘Aquí no tengo seguro’, dice, ‘así que tengo una forma de seguro más barata en el otro lado’. Se llama Plan de Salud SIMNSA Health Plan (Plan de Salud). Están relacionados con un hospital en San Diego, que está haciendo muchas mejoras y renovaciones en su clínica en Tijuana, lo cual es genial. La única dificultad ahora es el cruce, que puede ser bastante ajetreado.”²

(trans. ‘Cindy, 24, lives in Imperial Beach, not far from the border. She crosses the border into Tijuana every week or two, mostly to take advantage of the affordable medical care there. [...] ‘I don’t have insurance here,’ he says, ‘so I have a cheaper form of insurance on the other side.’ It’s called SIMNSA Health Plan (Plan de Salud). They are connected with a hospital in San Diego, which is doing a lot of upgrades and renovations at their clinic in Tijuana, which is great. The only difficulty now is the crossing, which can be quite hectic.’)

The border is crossed not solely out of necessity but also to maintain **family connections with relatives** residing on the opposite side of the barrier.²

“Jonathan vive en Playas de Rosarito [...]. Está cruzando el día de hoy para visitar a sus suegros. ‘Viven en Lemon Grove en el condado de San Diego’, dice en español. Jonathan es mexicano; su esposa es ciudadana estadounidense. Cruza la frontera ‘una o dos veces por semana’, generalmente con sus dos hijos pequeños, de 4 y 2 años, que nacieron en San Diego, pero también viven en Rosarito. Cruzar con dos niños pequeños es difícil incluso en los días buenos, dice. [...] Jonathan dice que él y su esposa esperan mudarse a San Diego en algún momento del próximo año, en parte, dice, debido a estos cruces de frontera con los niños. Pero también porque el crimen en México parece estar empeorando.”²

(trans. ‘Jonathan lives in Playas de Rosarito [...]. He is crossing today to visit his in-laws. ‘They live in Lemon Grove in San Diego County,’ he says in Spanish. Jonathan is Mexican; his wife is a U.S. citizen. He crosses the border ‘once or twice a week,’ usually with his two young children, ages 4 and 2, who were born in San Diego, but also live in Rosarito. Crossing with two small children is difficult even on good days, he says. Jonathan says he and his wife hope to move to San Diego sometime next year, in part, he says, because of these border crossings with the children. But also because crime in Mexico seems to be getting worse.’)

In the aftermath of the COVID-19 pandemic, which resulted in **increased living costs**, many Americans have begun relocating across the border, choosing to commute from Tijuana where the **cost of living is lower**.³⁶ This trend has had a positive impact on Tijuana, leading to the **development of new housing projects** designed to accommodate the influx of new residents.

4.4

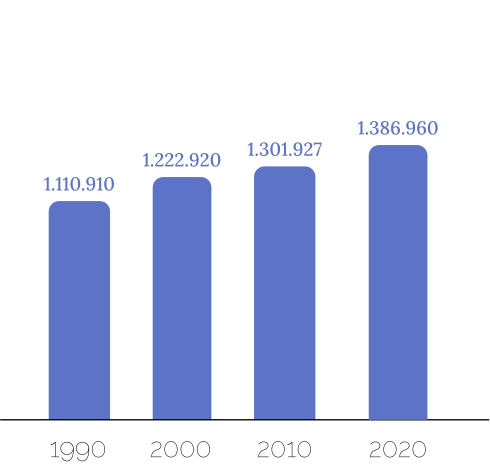
population

The San Diego-Tijuana region has historically witnessed **notable demographic growth**.

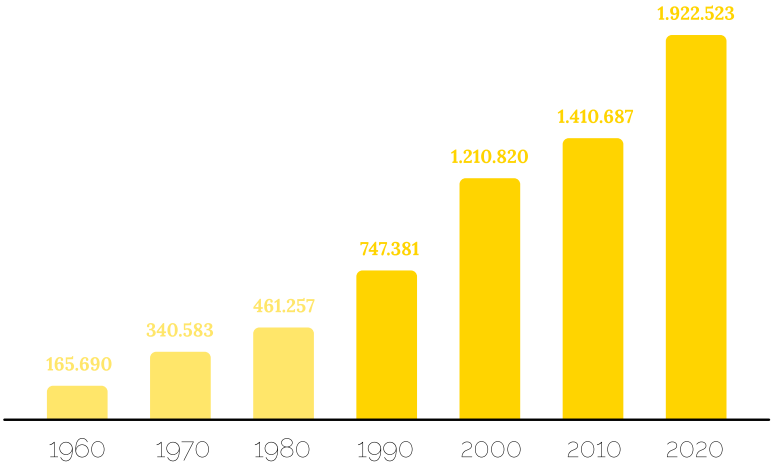
The city of San Diego was estimated to have a population of **1,388,320 in 2023**, a slight decrease of **0.1 percent from 2020** census figures,³⁷ from 1990 to 2020.³⁸ This modest decrease aligns with **broader state trends in California**, where the cost of living has escalated, particularly in the aftermath of the COVID-19 pandemic.³⁹ The **rise in housing rental prices**, particularly in San Diego and its county, has compelled residents to relocate to more affordable areas. According to *Dowell Myers*, a professor of policy, planning, and demography at San Diego State University, “*remote work was possible before COVID, but now we know it's even more viable to do that, and it's a great solution to high housing prices*”.⁴⁰

San Diego is segmented into **nine City Council districts**, each containing several neighborhoods. The **population distribution** across these districts is relatively balanced, with a **population density of 1,636 persone/km²**.⁴¹

Conversely, Tijuana exhibits a **larger population**, recorded at 1,922,513 in the 2020 census.⁴² Over the past six decades, Tijuana's population has expanded significantly, **increasing from 165,690 inhabitants** in the 1960s to nearly **2 million in the last census**.⁴³ The city is divided into **nine delegaciones**⁴⁴ (*trans. administrative districts*), which display **considerable variation in population distribution**. Notably, the La Presa Este delegación is the most densely populated, whereas the Centro delegación has the **smallest population**.⁴⁵



Population trends in San Diego



Population trends in Tijuana



The region under study exhibits a **notably low median age**. In San Diego, a **significant proportion** of the population is concentrated within the **25-34 age group (18%)** and the **15-24 age group (14.3%)**, with a substantial proportion also found in the **35-44 age group (14.2%)**.⁴⁶ Conversely, Tijuana's median age is reduced primarily due to a higher percentage of individuals in the **15-24 age group (17.6%)** and the **25-34 age group (17.2%)**, along with a considerable proportion in the **5-14 age group (16.3%)**.⁴²

The region's position at the border between the United States, a developed country, and Mexico, a developing country, **intensifies migration issues**. There is a significant influx of individuals attempting to cross the border in search of **employment and improved living conditions, exacerbating regional socio-economic dynamics**.⁴⁷ In fact, the city of Tijuana is reported to have the **largest network of migrant shelters on the U.S. border** counting some 38 operated by churches or religious groups.⁴⁸

Analysis of the demographic data reveals that **27.1% of San Diego's population** (approximately 344,000 individuals) are **foreign-born**. The majority of these residents originate from Latin America (44.2%) and Asia (43.1%), with smaller proportions from Europe (6.5%), Africa (4.5%), and North America (1.7%).⁴⁹

In a similar vein, Tijuana hosts a **substantial foreign population**, totaling **152,377 individuals**. The majority are from North America (85.7%) and Latin America (13.1%), with significantly lower percentages from Europe (0.6%), Asia (0.4%), and Africa (0.3%).⁴²

The **linguistic landscape** of the region mirrors the **demographic composition of its foreign-born population**. In San Diego, the predominant languages spoken are English (60.5%), Spanish (21.1%), and Chinese (11.5%), reflecting the **primary countries of origin** of the foreign residents. Other languages are represented to a lesser degree.⁵⁰

Additionally, the region includes **significant indigenous linguistic diversity**. San Diego County hosts **18 federally recognized tribal reservations** where indigenous languages such as Luiseño and Kumeyaay are predominantly spoken.⁵¹ In Tijuana, approximately **1.17%** of the population is **proficient in one or more indigenous languages**. The most commonly spoken indigenous languages include Mixteco (6,947 speakers), Zapoteco (3,821 speakers), Tarasco (2,202 speakers), and Náhuatl (2,137 speakers).⁴²

Educational attainment data reveal significant disparities within the region, warranting a detailed comparative analysis. In San Diego, **12.5% of the population lacks a high school diploma,**⁵² in stark contrast to 51.8% in Tijuana.⁴² Conversely, the proportion of residents who have completed high school but **have not pursued further education** is higher in Tijuana (27.1%)⁴² compared to San Diego (16%).⁵² Regarding **higher education**, 25.8% of San Diego's population holds a bachelor's degree,⁵² whereas only 13.7% of Tijuana's residents have achieved this level of education.⁴²

San Diego supports a **robust network of higher education institutions**, hosting 17 universities and city colleges.⁵³ In contrast, Tijuana offers 10 of these institutions.⁵⁴ A notable institution in Tijuana is **CETYS Universidad**, which received accreditation from the **Western Association of Schools and Colleges (WASC)** in 2012, placing it on par with institutions such as **California State University.**⁵⁵ This accreditation has made CETYS an attractive option for students from San Diego who cross the border daily to attend due to its lower tuition fees and smaller class sizes, facilitating more individualized instruction.⁵⁵

Furthermore, the **Binational Migrant Education Initiative (BMEI)**, established in 1976, is pivotal in addressing educational **needs across the border.** This initiative involves **border states** and offers a **binational curriculum** designed to ensure **educational equivalency** for Mexican students relocating to the United States. The BMEI supports educational continuity and standardization, enabling migrant students to transition **seamlessly between the Mexican and U.S. education systems.**⁵⁶

San Diego faces a **significant social crisis** characterized by **rising poverty and homelessness**, exacerbated by increasing living costs and the presence of migrants in Tijuana who are awaiting opportunities to cross the border. This crisis reflects **broader socio-economic challenges** in the region.

While many parts of San Diego enjoy considerable **economic prosperity**, a notable proportion of its residents experience precarious living conditions. According to recent data, in 2023, San Diego's **homeless population reached 10,264**, with only 5,093 individuals receiving accommodation in shelters or transitional housing facilities.⁵⁷ This rise represents a **significant social challenge**, mirrored by a 161% increase in the number of independent and family foundations active in the county from 2015 to 2021.⁵⁸ In contrast, **Tijuana's Public Safety Department** estimates that around **1,800 people experience homelessness in the city**, although precise data is lacking for the broader region.⁵⁹

Drug addiction further compounds these challenges. The region's position along the United States' **busiest border** has led the Drug Enforcement Administration to designate it a **high-intensity drug trafficking area.**⁶⁰ San Diego saw a 70% increase in **drug overdose rates** between 2019 and 2020. Additionally, reports indicate that between 15% and 54% of **individuals with disabilities** in San Diego travel to Mexico to access drugs, due to the easier and more affordable availability of these substances.⁶⁰

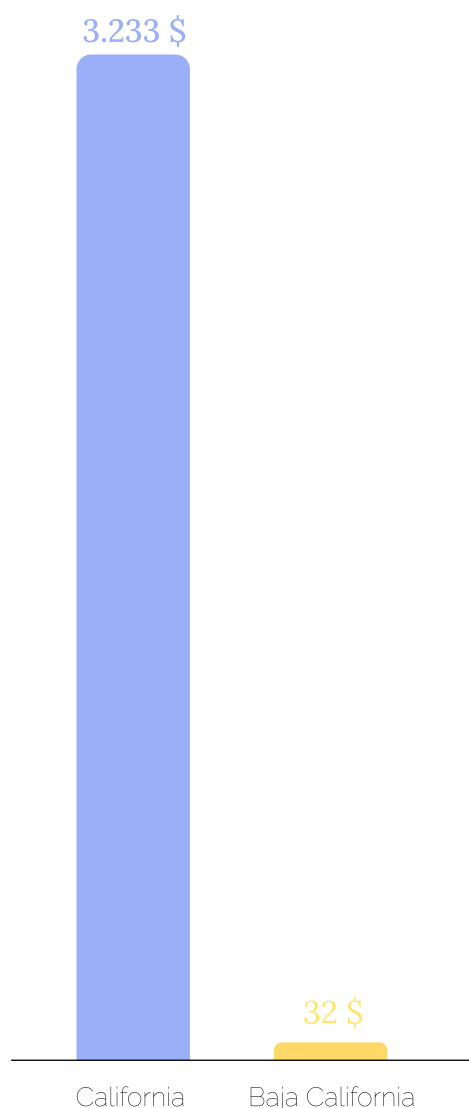
Fentanyl has emerged as the primary drug consumed in the San Diego-Tijuana region. In 2023, **U.S. Customs and Border Protection (CBP)** intercepted approximately half of the total 9,500 kilograms of fentanyl seized at the ports of entry between San Diego and Tijuana. This substantial volume underscores the escalating presence of fentanyl in regional drug markets.⁶¹

Historically, individuals in the United States who developed dependencies on prescription opioids, including fentanyl, frequently transitioned to heroin produced in Mexico when **prescription drugs became inaccessible.** However, recent data reveals a **shift away from this trend.** Fentanyl is now preferred over heroin due to its **lower cost and simplified production process.** Unlike heroin, which requires extensive agricultural resources for cultivation, fentanyl can be **synthesized in laboratories**, making it more accessible and economically viable for illicit producers. The increased preference for fentanyl, driven by its affordability and ease of production, contributes to its **pervasive presence and poses heightened risks** associated with opioid misuse, including **higher rates of overdose** due to its potency.⁶¹

Crime rates also reflect a stark contrast between San Diego and Tijuana. **San Diego** boasts one of the **lowest crime rates among large U.S. cities,**⁶² whereas **Tijuana** has a **high incidence of violent crime**, largely due to its history with **drug cartels.** From 2019 to 2023, Tijuana averaged over 2,000 homicides per year. Despite this, Tijuana remains one of Mexico's most **economically successful cities.**⁶³

4.5

economy



Comparison between the GDPs of the two states.
in billion dollars

From an economic perspective, several key aspects can be highlighted by examining economic indicators. Firstly, there is a **significant disparity between the Gross Domestic Product (GDP)** of the two countries to which the border cities belong. In 2023, **California ranked first among U.S. states by GDP**, with 3,233.15 billion U.S. dollars.⁶⁴ In contrast, its Mexican counterpart, the state of Baja California, had a GDP of 599.22 billion Mexican pesos (approximately 32.50 billion U.S. dollars) in 2021.⁶⁵

This disparity is reflected in crucial aspects of people's lives in the two cities, such as the **average cost of living**, which is about **twice as high in San Diego compared to Tijuana**.^{66 67} However, this economic difference is **not reflected in the labor market trends**. Both cities show a quaintly **low unemployment rate**, with San Diego ranking second at 4.9 percent,⁶⁸ compared to Tijuana's 1.8 percent.⁶⁹

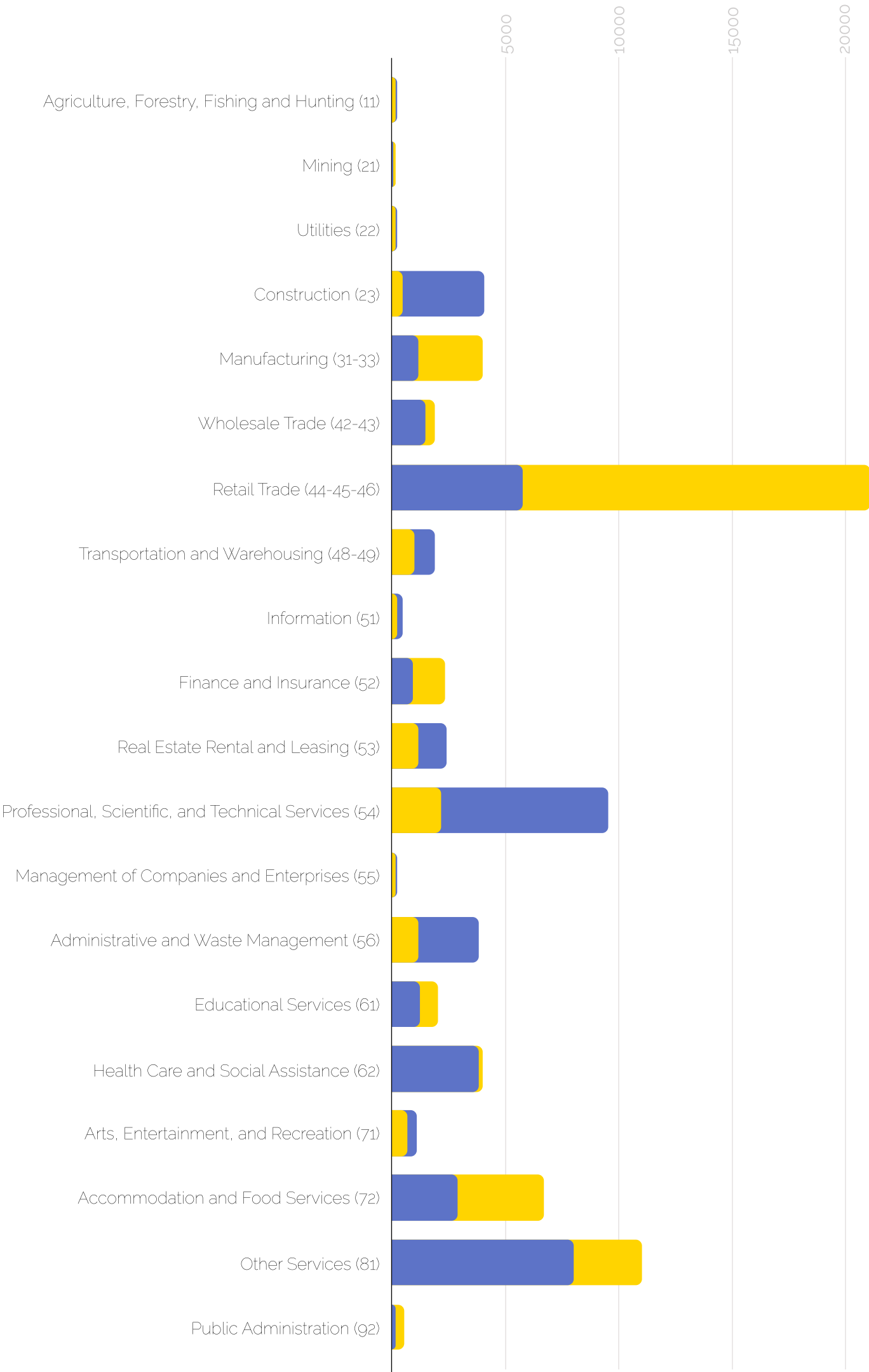
In terms of **manufacturing sectors**, the two cities rank in line in terms of number of firms. **San Diego**, with a total of **49,462 firms**, has a robust presence in the professional, scientific and technical services sectors, as well as health care and social assistance. This reflects San Diego's importance as a center for **scientific research, technological innovation and advanced health services**.⁷⁰

Tijuana, with a total of **60,145 businesses**, shows a strong concentration **in manufacturing and retail trade**. This highlights Tijuana's role as an industrial and manufacturing center, as well as an important **commercial node**.⁷¹ The importance of the manufacturing sector in Tijuana is due to the **phenomenon of maquiladoras**. *

A maquiladora is defined as a **foreign-owned plant located in Mexican territory that processes and/or assembles components imported duty-free for foreign trade**.⁷² Such plants, which are quite conspicuous in cities near the border,⁷³ such as Tijuana, **belong to different industries** but the most important to date are **electronics and clothing**.⁷⁴ It is common for some cities in Mexico to be paired with nearby U.S. cities,⁷⁵ which explains why **116 out of the 608 total head offices of maquiladoras are located in San Diego**.⁷⁴

legend

San Diego Tijuana
U.S.A. Mexico



Number of enterprises by economic sector.

*
“ Maquiladoras (also known as "twin plants") are manufacturing plants in Mexico with the parent company's administration facility in the United States. Maquiladoras allow companies to capitalize on the less expensive labor force in Mexico and also receive the benefits of doing business in the United States. Companies operating in the United States can send equipment, supplies, machinery, raw materials, and other assets to their plants in Mexico for assembly or processing without paying import duties. The finished product can then be exported back to the United States or to a third country. ”⁷⁶

City of San Diego

As a consequence of the maquiladoras phenomenon, there is a **significant impact on cross-border trade**. It is estimated that the value of commercial exchanges across the border amounts to **\$45 billion**,⁷⁷ primarily consisting of electronic products.⁷⁸

Additionally, there is the particular case of **individuals crossing the border to purchase goods** for personal use. Movements from north to south are typically for the acquisition of **pharmaceuticals, food products, artisanal goods, or auto parts**, while movements from south to north are mainly for purchasing **clothing, electronic products, and vehicles**.⁷⁹ That figure is also narrated by local professors, such as *David Shirk*, of the UCSD university, which states:

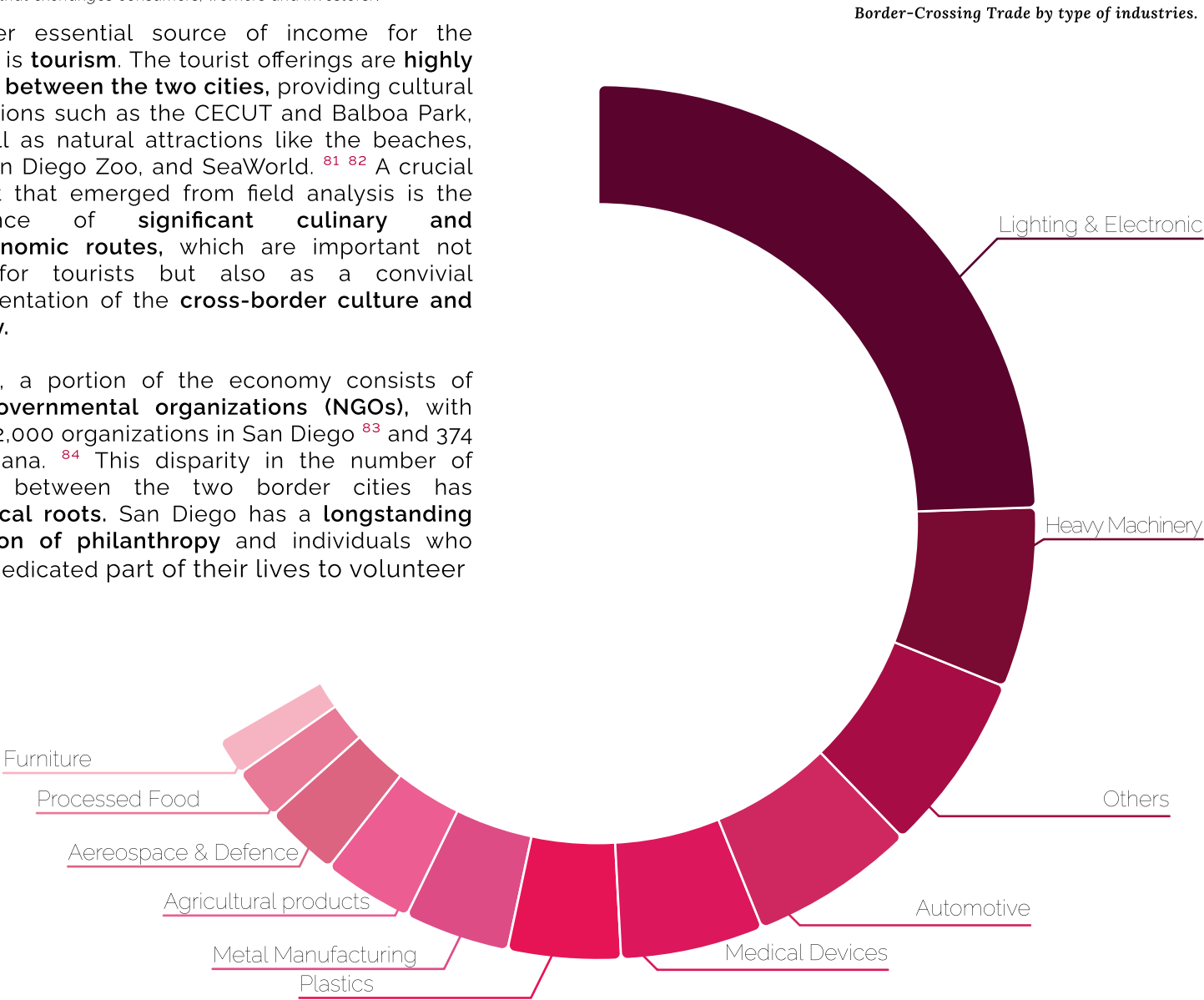
*“Miles de personas cruzan para hacer sus compras, ir a la escuela, trabajar... es una ciudad pequeña que cruza la frontera a diario porque es una sola economía que intercambia consumidores, trabajadores e inversionistas.”*⁸⁰

(trans. “Thousands of people cross to shop, go to school, work...it’s a small city that crosses the border every day because it’s a single economy that exchanges consumers, workers and investors.”)

Another essential source of income for the region is **tourism**. The tourist offerings are **highly varied between the two cities**, providing cultural attractions such as the CECUT and Balboa Park, as well as natural attractions like the beaches, the San Diego Zoo, and SeaWorld.^{81 82} A crucial aspect that emerged from field analysis is the presence of **significant culinary and gastronomic routes**, which are important not only for tourists but also as a convivial representation of the **cross-border culture and history**.

Finally, a portion of the economy consists of **non-governmental organizations (NGOs)**, with over 12,000 organizations in San Diego⁸³ and 374 in Tijuana.⁸⁴ This disparity in the number of NGOs between the two border cities has **historical roots**. San Diego has a **longstanding tradition of philanthropy** and individuals who have dedicated part of their lives to volunteer

operations from below that have shaped the landscape of cross-border relations. The issues addressed by these organizations vary a lot, with a significant portion, in both cities, dedicated to **Human Services**. Additionally, important themes for San Diego include **International and religion-related NGOs**, while **Health is a major focus for Tijuana**.^{85 86}



4.6

culture

Culturally speaking, although the two cities belong to **different countries** and each maintains its **own identity**, it is undeniable that over time, individual identities have intermixed, **generating a hybrid culture**, commonly known as the Cali-Baja culture. Before determining whether one can speak of a border culture, it is essential to **provide a definition and geographical context**:

“Cali Baja surge de la fusión entre los nombres del estado de California (EE.UU.) y el estado de Baja California (México). La regione è composta dalle contee di San Diego e Imperial Valley dalla parte statunitense e dai cinque comuni della Bassa California dalla parte messicana: Tijuana, Tecate, Mexicali, Playas de Rosarito ed Ensenada.”⁸⁷

(trans. “Cali Baja arises from the merger between the names of the state of California (USA) and the state of Baja California (Mexico). The region consists of the counties of San Diego and Imperial Valley on the U.S. side and the five municipalities of Lower California on the Mexican side: Tijuana, Tecate, Mexicali, Playas de Rosarito, and Ensenada.”)

The **uniqueness of this territory** lies in recognizing a mutual interdependence, particularly in cultural terms. As stated by *Kurt Honold*, Minister of Economy and Innovation of the state of Baja California, Mexico:

“En Cali Baja no existen las fronteras. Una línea nos divide, pero no la vemos.”⁸⁷

(trans. “In Cali Baja there are no borders. A line divides us, but we do not see it”)

One of the primary aspects expressing this **essence of border culture** is the opportunity to utilize leisure time and fully enjoy the **extensive cultural offerings** of both cities. Numerous **bookstores, museums, cinemas, theaters, and nightclubs enliven the border life.** ⁸⁸ Among these are cultural centers that particularly represent binational culture, including:

The **Chicano Park Museum and Cultural Center** in San Diego is dedicated to narrating the history of the **Kumeyaay territory**, colonized by Europeans. The park's mission is to **illuminate historical memory, condemning acts of colonialism, genocide, and forced assimilation** carried out in the name of white supremacy. It serves as a bridge for dialogue and education, working towards **"decolonizing the mind"** through actions, words, and visual art. ⁸⁹



Hasta la Bahia (April 8, 2024).
made by the authors

The **Bonita Museum** houses an extensive collection, housing more than 2,000 artifacts that chronicle the art, history, and culture of the Sweetwater Valley. The **Sweetwater Valley was one of the areas inhabited by the Kumeyaay**, originally called Apusquel by the Kumeyaay and then La Purisima by the Spanish, which has undergone significant changes. ⁹⁰



Cesar Hernandez Wall at the Sine Kwentto exhibit (November 12, 2020).
from San Diego Magazine

The **Spanish Village Art Center**, located inside **Balboa Park**, is the primer artist collective in San Diego. It hosts art from different disciplines, including painting, sculpture, jewelry design, and digital art. Inside, it is then possible to witness **live production** of some of the works by the artists. ^{91 92}



Spanish Village Art Center (n.d.).
from Balboa Park



Centro Cultural de la Raza (n.d.).
from San Diego Museum Council



Barona Cultural Center & Museum Wins 2022 AASLH History in Progress Award and Award of Excellence (June 19, 2023).
from Split Rock Studios



El Centro Cultural Projection (2001).
by Krzysztof Wodiczko from Harvard University



Casa de la Cultura Tijuana (n.d.).
from IMAC

The **Centro Cultural de la Raza**, also located within Balboa Park, has as its intent to **promote and educate** about Chicano, Mexicano, Latino and Indigenous art and culture. This intent is promoted through different initiatives ranging from exhibitions to musical performances, from folk dances to **traditional Aztec culture dances**, from **film screenings to readings**.^{93 94}

The **Barona Cultural Center and Museum** presents thousands of historical artifacts from the **local indigenous Kumeyaay-Diegueño community**. In addition, it is the first museum in San Diego County **to rise on an Indian reservation**, seeking to preserve its value and transmit it to the outside world.⁹⁵

The **CECUT - Tijuana Cultural Center**, is a stage for exhibitions on the **region's history**, an aquarium, a botanical garden, the Moon Forum, the International Gallery The **Cube and the IMAX theater**, which determines its **distinctive shape**.⁹⁶

The **IMAC-Instituto Municipal de Arte y Cultura** wants to act as a bridge between artists and residents of Tijuana, thanks to its **4 Houses of Culture**, the Network of Municipal Libraries, as well as the Tijuana Historical Archives (AHT), the Tijuana Museum of History (MuHTi) and the Galleries in their different spaces.⁹⁷ Prominent among the culture houses is the **Tijuana House of Culture**, which offers courses in different artistic disciplines.⁹⁸

Border culture, however, is **not confined to the walls of a museum or the spaces** of a cultural center; it is more broadly a **structural phenomenon evident** in the daily lives of those living at the intersection of two worlds, two states, and the twin cities of San Diego and Tijuana. This culture is discernible in **both language and cuisine**.

This finding should come as no surprise; indeed, according to the theories of urban planner Teddy Cruz, San Diego and Tijuana should not be viewed as two separate cities, but rather as **a single urban system divided by an international border**. This perspective is also reflected in the theories of geographer Michael Dear, who characterizes **the two cities as a single cultural unit**. Dear argues for the existence of a **"third nation"** straddling the United States and Mexico, with its own frontier culture that **inherently does not belong to either country** but constitutes an independent entity.¹⁰⁰

In her semi-autobiographical book, *"Borderlands/La Frontera"*, Gloria Anzaldúa profoundly describes the **feeling of being Chicana**, highlighting cultural and **linguistic aspects** that warrant further exploration. Anzaldúa examines how the Chicana language is an essential component of border identity, a linguistic hybrid that **reflects the complexity of experiences lived between two worlds**.

*"I remember being caught speaking Spanish at recess--that was good for three licks on the knuckles with a sharp ruler. I remember being sent to the corner of the classroom for "talking back" to the Anglo teacher when all I was trying to do was tell her how to pronounce my name. "If you want to be American, speak 'American! If you don't like it, go back to Mexico where you belong." "*¹⁰¹

*"Chicano Spanish is considered by the purist and by most Latinos deficient, a mutilation of Spanish. But Chicano Spanish is a border tongue which developed naturally. Change, evolución, enriquecimiento de palabras nuevas por invención o adopción have created variants of Chicano Spanish, un nuevo lenguaje. Un lenguaje que corresponde a un modo de vivir: Chicano Spanish is not incorrect, it is a living language. "*¹⁰¹

*"Chicano Spanish sprang out of the Chicanos' need to identify ourselves as a distinct people. We needed a language with which we could communicate with ourselves, a secret language. "*¹⁰¹

*"Words distorted by English are known as anglicism or pochismos. The pocho is an anglicized Mexican or American of Mexican origin who speaks Spanish with an accent characteristic of North Americans and who distorts and reconstructs the language according to the influence of English. Tex-Mex, or Spanglish, comes most naturally to me. I may switch back and forth from English to Spanish in the same sentence or in the same word. With my sister and my brother Nune and with Chicano tejano contemporaries I speak in Tex-Mex."*¹⁰¹

The author's observations are equally valid for the area under analysis, where the border culture led to the emergence of "Spanglish". The linguistic aspect, known as **"Spanglish"** *, is a prominent feature.

This phenomenon is **highly prevalent in border cities like Tijuana**, where it has evolved into a **distinctive mode of communication**, producing hybrid words and phrases.^{102 103} This way of speaking is peculiar as it **reflects integration** rather than **cultural assimilation, influenced by both immigration and media such as cinema and television**.¹⁰⁴

* *"varietà linguistica ibrida, che mescola spagnolo e inglese, parlata in partic. dagli spagnoli immigrati negli Stati Uniti d'America"*⁹⁹

(trans. "hybrid language variety, mixing Spanish and English, spoken particularly by Spanish immigrants to the United States of America").

The second **symptomatic aspect** of integration is the **culinary exchange**. Over time, the border cities have merged and integrated their culinary traditions, resulting in a unique cuisine known as **Cali-Baja Cuisine**.¹⁰⁵ As discussed in the historical chapter, several factors have **facilitated this fusion**. Beer served as a precursor to more elaborate foods and beverages, such as Fish Tacos, Caesar Salad, and the iconic California Burritos, which owe their names to the blend of diverse culinary cultures.

4.7

see closely

Reflections on the sun (March 18, 2024).
made by the authors

During the 46-day stay in San Diego, it was possible to closely observe the dynamics discussed in the chapter and to **become aware of many aspects overlooked by numerical data.**

The **connection and proximity** between the two cities are palpable and evident in daily life. Frequently, while walking through the streets or visiting local venues, one can **hear people speaking Spanish**, although less so in academic settings, particularly within the context of UCSD. It was not uncommon to engage in conversations with taxi drivers from Mexico, whose opinions about Tijuana varied **depending on their region of origin.**

In general, when discussing our research and the possibility of crossing the border, people **expressed a certain degree of concern.** However, our direct experience led us to observe that Tijuana was not the city of terror described by many. On the contrary, we felt **welcomed by the Mexican community and its people**, as exemplified by our visit to the Farland Brewery, which pleasantly surprised us.

Another context of cultural exchange is the **shopping centers**, often frequented by people of Mexican origin, such as the **Americas Premium Outlets.** In these situations, people frequently addressed us in Spanish, mistakenly associating our conversation with the **Spanish language.**

One of the most significant observations was the **relationship between humans and nature**, and between humans and the ocean, in both cities. Walking along the shores of San Diego and Tijuana, it is **delightful to see how people engage with nature** enthusiastically, appreciating its colors and daily changes. This enthusiasm is reflected in the various **initiatives by non-profit organizations** dedicated to environmental protection. We learned a great deal about grassroots participation methods, often implemented as **part of a broader philanthropic culture.**

A notable context where the willingness to take a stand on environmental issues was observed was the festival organized by the **Bountiful Bag association.**¹⁰⁶ This company produces bags from grain sacks discarded by local breweries in their beer-making processes. Once a year, Bountiful Bag promotes a festival, the **Bountiful Earth Benefit Event**, described as **"a celebration of sustainable art, craft beer, entertainment, and environmental awareness."**¹⁰⁷ Held near the Westbrew brewery, the event features various associations committed to environmental preservation through **small daily actions.**

One of the most shocking aspects was **the presence of many homeless individuals** living in inhumane conditions. Walking through Little Italy, Downtown, and Gaslamp, we witnessed scenes of people struggling to stand, victims of the so-called **"zombie drug",**¹⁰⁸ fentanyl, which leaves them in a **state of unconsciousness.** Unlike the observed attention to the natural environment, people seem to ignore the plight of these street inhabitants, likely a legacy of San Diego's strong Protestant heritage.

Another pervasive aspect of the cities of San Diego and Tijuana is the **presence of street art.** Walking through the streets, parking lots, and intersections, one can witness **urban decorations**, more or less institutionalized, that contribute to making the **environment vibrant and colorful.**

In the **academic environment**, we felt warmly welcomed from the moment we arrived and even before. The atmosphere at the UCSD campus is very international, which greatly facilitated our integration. The work of **Professor Mai Nguyen** and **Professor Julie Wartell** provided a **fertile ground for our project idea to flourish.** The same cannot be said for corporate collaborations, which were often **challenging to approach and engage.**

4.8

an area of action

Numerous aspects have been explored in this analysis, ranging from history to economic features, from population to culture, and from statistical data to more personal impressions. However, one element has subtly **underscored many of the topics discussed here**: a beverage synonymous with the culture of Cali-Baja but with roots that extend much further back, **the beer**.

The decision to focus on this sector was **far from simple**. There are numerous themes that could be addressed when discussing this region, but the intrinsic ability of an **alcoholic beverage to transcend cultural boundaries** motivated the in-depth investigation that will be presented in the following chapters.

Moreover, **the scalability** of a project that begins with an **everyday element** sparked a desire to delve deeper into the world surrounding the production sector. It is therefore believed that this focus **will benefit this research, as well as future studies**, by encouraging people to look beyond the delineation of a border, sharing an element and **a common moment of conviviality**.

authors' note

*The following pages will show a canvas summary
of the research done in the field, showing the
most significant data within a holistic schema.*

San Diego & Tijuana

one region, two countries

- Legend**
- San Diego
 - Tijuana
 - Both of them
 - Reading lines

1.381.162 | **Population** | 1.922.513
1.636 | **Density** | 1.550

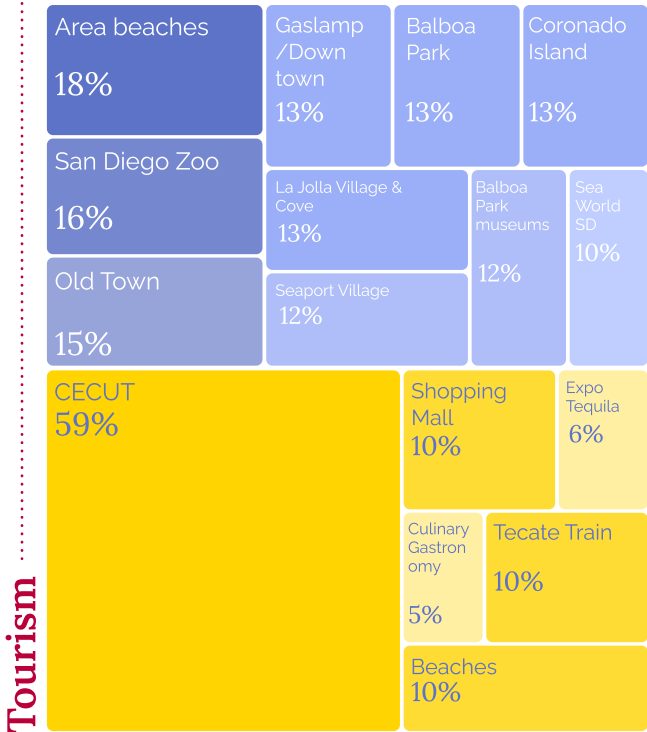
“Mexican Americans in San Diego County have the best of two worlds. Because Mexico is so close, many can savor their ancestral heritage by crossing the border and blending into the Latino atmosphere.

Then, just as easily, they can return across the border, reassuming their American life style.

But, for many Mexican Americans here, the best of two worlds sometimes isn't enough. Numerous Chicanos interviewed by The Times said they merely feel tolerated or reluctantly accepted by San Diego County's vast Anglo majority.”

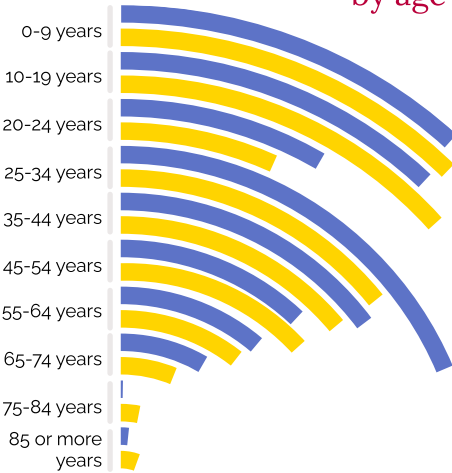
The Los Angeles Times, 1983

Cali-Baja food



Tourism

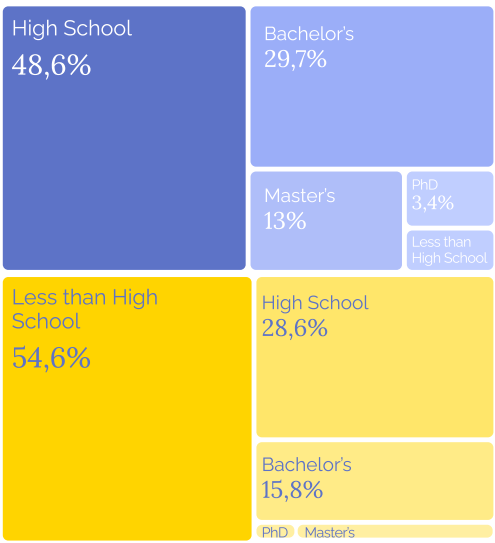
Population by age



“The young people in the region see themselves as part of both countries, with a quarter of students identifying as both American and Mexican, regardless of actual country of birth.”

The Students We Share: At the Border

Education



Average Cost of Living

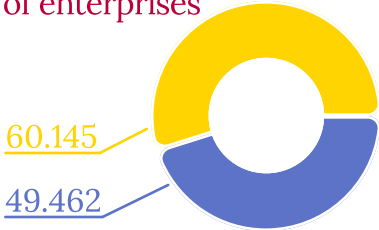


95,01% | **Employment rate** | 98,20%

Economy by sector



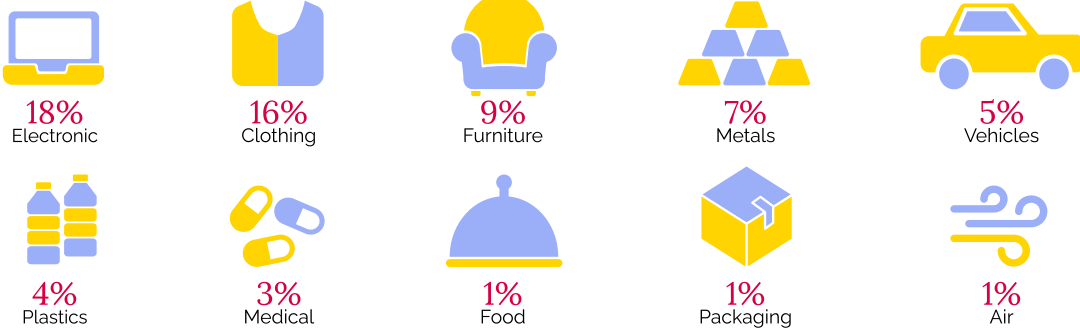
Total number of enterprises



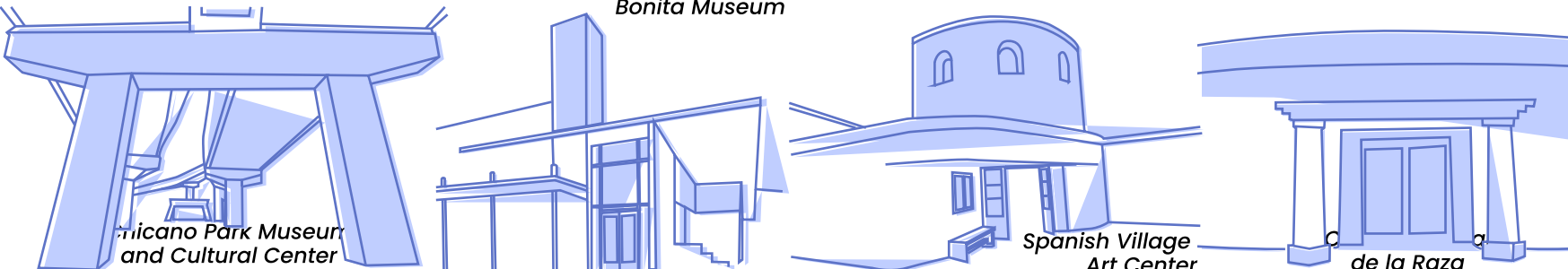
Maquiladoras

116 | Head offices in San Diego

608 | Maquiladoras in Tijuana



Bonita Museum

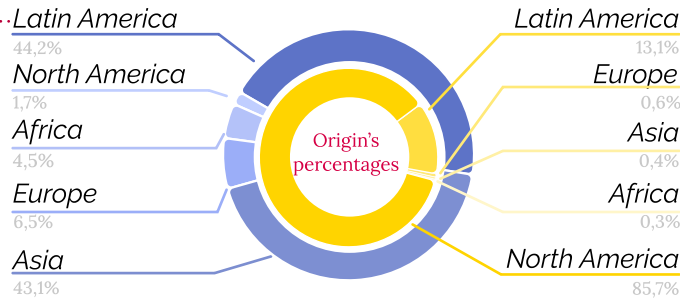


Cultural Centers

Indigenous languages



344.000 Foreign population 152.377

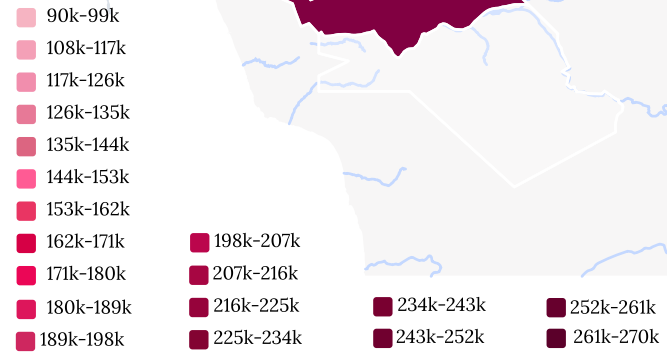


"Before being Mexican, I am from Tijuana. Taggers, raves, techno those are words you can't translate. I have to like this transculturation, this hybrid language. That's what I am."

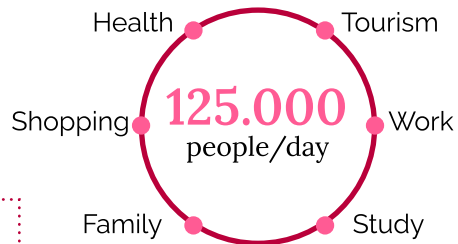
Fran Ilich (18 years old)

Inhabited areas

Legend



People who cross



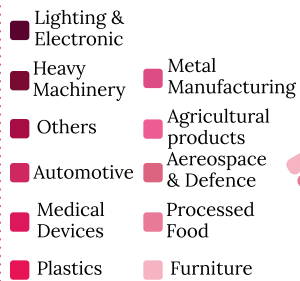
Spanglish fostered by



television
immigration

Border-Crossing Trade by type of industries

Legend



\$45 billion cross-border trade/year

B2C Purchasing

Pharmaceuticals
Bottled beverages
Foods
Arts and crafts
Car repairs

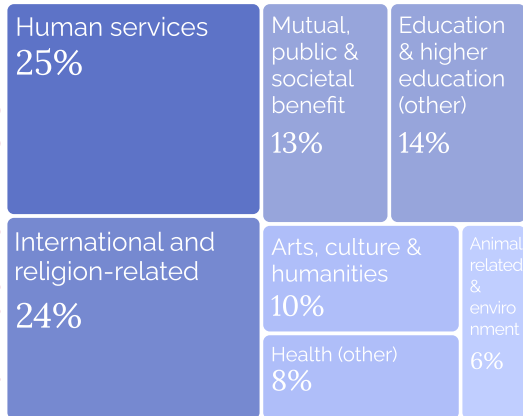
Clothing
Electronic products
Vehicles

¿Cuál es la verdad sobre la frontera a dos décadas del comienzo del siglo XXI?

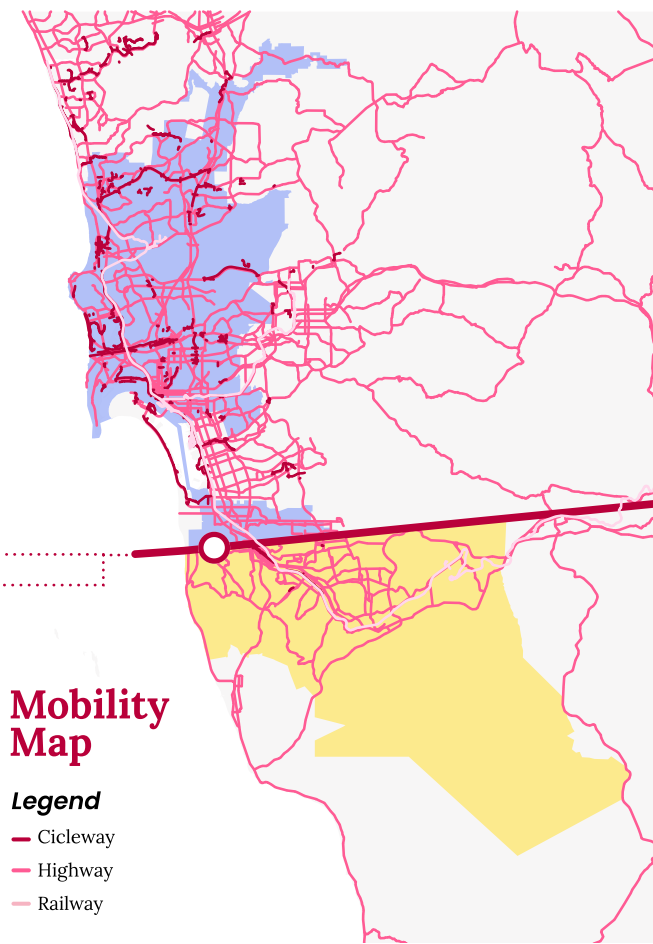
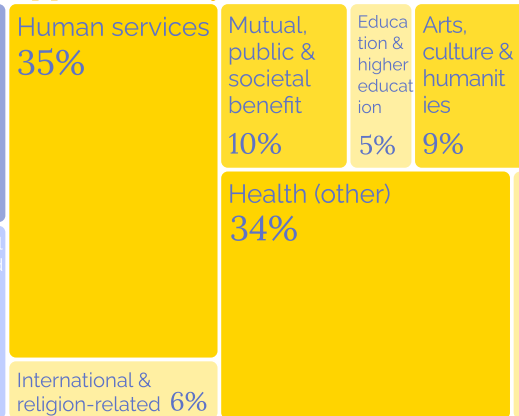
Es una que contempla setenta mil vehículos (...) que se dirigen al norte cada mañana a través de hasta treinta y dos carriles de la garita de San Ysidro. La realidad actual es que estos autos están llenos de **estudiantes y trabajadores** que han encontrado escuelas y empleos de calidad en San Diego, pero que consideran a Tijuana su hogar, y a México su nación. Otros viajeros se dirigen **a hacer compras** en EEUU, o a **asistir a un partido** de los Padres, o a **visitar el San Diego Zoo**."

El Tercer Pais, 1983

More than 12.000 NGO

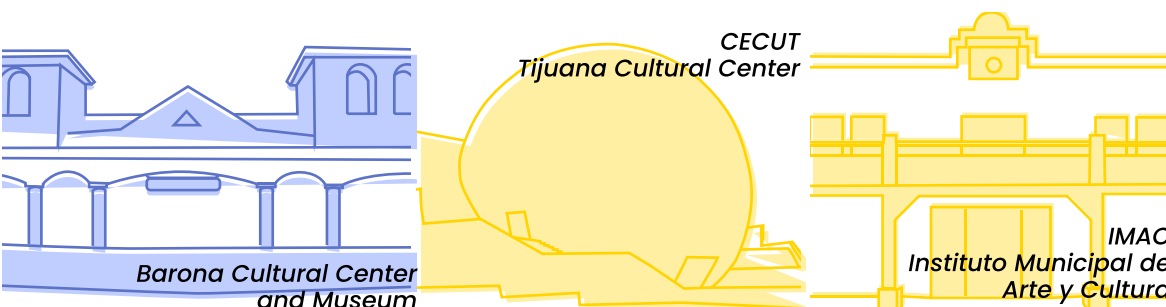


Approximately 374 NGO



Mobility Map

Legend



bibliography and sitography

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the brew sector

5.1 CRAFT BEER, AN ENGINE OF CHANGE?

5.2 HISTORICAL DIMENSION

5.3 WHAT ABOUT TODAY?

5.4 A CULTURE AROUND

5.5 PRODUCTION PROCESS

5.6 FROM OUTPUT TO INPUT

5.7 TASTE CLOSELY

5.8 BEER ECOSYSTEM

5.9 TOWARDS THE PROJECT

5.1

craft beer, an engine of change?

The **alcoholic beverages industry** and **production sector** has always shaped human history, acting as a **catalyst for commercial exchanges** in the Mediterranean area and along the Silk Road. Consequently, it has facilitated not only the **transfer of raw materials** and, above all, **cultural exchange**.

"[T]he driving forces in human development from the Paleolithic period to the present have been the uniquely human traits of self-consciousness, innovation, the arts and religion, all of which can be heightened and encouraged by the **consumption of an alcoholic beverage**, with its **profound effects** on the human brain." ¹ these are the words of Prof. McGovern, director of the Biomolecular Archaeology Project at the University of Pennsylvania Museum. What emerges is that "*beer acts as a **social glue**, providing a **common point of interest** around which social gatherings can be formed*". ²

While alcoholic beverages have often brought people together, that have also served as an **incentive for division, promoting independence** and **establishing a torn national sovereign**. For instance, the American Revolution saw "*Thomas Jefferson, Samuel Adams, and George Washington all were involved in brewing and saw British control of the brewing industry as **antithetical to America's nascent democracy***". ³

Unsurprisingly, breweries become **spokespeople for hot topics** in the current socio-political landscape, spotlighting support for certain causes. These topics span a wide range in three main areas: environmental, social, and economic, at a local level, acting as "**geographical agents**". ⁴ U.S. metropolises "*have encouraged the establishment of craft fermenters as a **component of their economic and community development strategies***". As a result, these contexts have been the subject of study by many scholars in recent years, especially for their **dual function** as places of both **aggregation and exclusion**. ⁵

*Inside a parking garage. (March 9, 2024).
made by the authors*



beer as a bridge

In the context of a divided region, taking into exam, where the north contrasts with the south, the first world with the third, and San Diego with Tijuana, beer emerges as a **unifying force** that **brings together** two **different cultures**. A simple Google research for “*Tijuana beer tour*” reveals that the majority of them starts from San Diego, symbolizing the **shared identity** of the two cities. This implies that, Tijuana is not the only city that benefits from **cross-border tourism**; San Diego also gains from it, **indirectly promoting** the establishment of **new breweries** in the neighboring Mexican city and **supporting them** in sourcing **raw materials**, as evidenced by local producer Rudy Lopez. Somehow, even for the craft beer sector, one could say: “*De manera importante, San Diego ahora necesita Tijuana, tanto como Tijuana necesita a San Diego.*”⁶ (trans. “*Importantly, San Diego now needs Tijuana as much as Tijuana needs San Diego.*”).

“**Collaboration and creativity a distinctive of the craft beer industry**”⁷. As Professor Almaraz of El Colegio de la Frontera Norte explains, in a competitive landscape dominated by large brewing conglomerates, these partnerships **play a crucial role** in actively responding to and **resisting market pressures**. The region's geography is a **driving force** behind these partnerships, with the Mexico-US border between Baja California and California being an emblematic example.⁷

The analysis conducted by Professor Almaraz highlights a **long-standing collaboration** between Baja California (and in particular the city of Tijuana) and the United States. The history dates back to the **Prohibition era** in the USA, a period when **beer production** in Mexico **flourished** thanks to the **collaboration** of American and Mexican entrepreneurs. This partnership **sparked the tourism industry** as we know it today, which was evident during the stay in San Diego.⁷

Craft beer, with its rich history, stands as a **symbol of unity**, a bridge, **transcending** cultural, geographical, and political **divisions**. **Collaboration between breweries** in San Diego and Tijuana, two cities so close yet so different, can create a **more united community**.

In recent years, **private collaboration** between the two cities **has increased**, especially regarding **border-related issues**. An example is the willingness of private sector, on both sides of the border, to respond collectively “*to regional issues such as border delays and the proposed US VISIT program*”⁸, although there is still a long way to go.

In 2002 the **International Community Foundation** identified 11 aspects to **strengthen the social capital** of the San Diego-Tijuana region. This paper **selects 4** on which **binational cooperation** between craft breweries can have a **positive impact**:

1. **Prejudices and perception must be overcome.**⁸ The tendency within the San Diego territory is to **view the border** as a **problem**, a source of **concern** and **fear**. This leads people not to cross the border, however, “*if progress is to be made, such prejudices and perceptions must be overcome.*”⁸
2. **Promote opportunities for cross-border trade, commerce, tourism and cultural exchange with migrant sending communities.**⁸ Developing a more **explicit** and **sustainable craft beer production network** can strengthen ties between the two cities, not only commercially but also culturally, improving mutual understanding and social cohesion.
3. **Philanthropy plays a critical role in addressing unmet border challenges and needs.**⁸ The region needs to expand philanthropy beyond regional borders, **promoting the cause**.
4. **We need to focus on our collective regional assets.**⁸ The need is to build on the strengths of the region, and beer is definitely one of them, that should be used to **promote collaborations**.

Cooperation should not be limited to craft breweries but should **include other entities**. Research on craft beer waste shows how **small businesses** can **reduce** their **environmental impact**. “In particular as small breweries become more prevalent in the community locally available materials will allow a range of opportunities for breweries to diversify and for other industries to **benefit from cooperation** in disposal.”⁹

Such a prospect could lead to an **economic benefit** for companies, as shown by a study of breweries in Maine: “*That is, economic gains cannot be achieved unless social gains are pursued as well. The key for this paradox to succeed is involving and engaging their core followers. Stakeholder theory research shows that stakeholders are more accepting when they perceive the process to be fair.*”¹⁰ This does not only apply to breweries that start up within the city, but also to those that **expand** beyond the **city limits**: “*Interestingly, the local community seems to accept non-local businesses as long as they feel engaged and connected to the business and their beer.*”⁹



5.2

historical dimension

authors' note
A timeline will accompany some pages of this chapter to allow for synoptic reading

legend

San Diego

Production

Tijuana

Ingredients

Culture

Selling

Scientific progress

..... 1000 years

----- 100 years

--- 10 years

beer as a bridge

Before delving into the beer industry, it is essential to shed light on the **historical context** that led to the **development** of this beverage and its **production** and **consumption** markets, particularly in the United States and Mexico.

Beer production has **ancient ties** to the creation of the staple food of all cultures: **bread**. For this reason, beer is often referred to as "**liquid bread**" in many cultures, as it was initially made by **fermenting** partially **baked bread**.

This link seems to be of such historical enough that, in the **1950s**, several scholars, led by **Robert Braidwood**, were led to **question** whether **man was driven to cultivate cereals to produce bread or beer**. The first cultivation of cereals, in fact, dates back to around 9000 B.C. in the Middle East. Scholars have offered various answers: some believe beer production was the incentive for **growing grain**, while others, beer was used by people to **preserve grain** after drying.¹¹

The earliest **traces of beer** date back about **9,000 years** and are not confined to a single culture but are **found across various civilizations** around the world. Archaeological evidence from **around 7000 B.C.**, such as pottery used for consuming a beer-like beverage, has been discovered in **China and Peru**. At the **Jiahu site** in China, archaeologist **Patrick McGovern** identified traces of a **beer-like beverage** in **ceramic vessels**; this drink was made from **rice, wild grapes or honey, and hawthorn fruit**. Meanwhile, at the Peruvian site of **Cerro Baúl**, a team led by archaeologist **Dolores Piperno** found remains of **Schinus molle seeds**, which women **used to brew beer** by utilizing the natural sugars present in the berries.¹²

Advancing several centuries to **around 4000 B.C.**, in the Fertile Crescent between the Tigris and Euphrates rivers in **Mesopotamia**, civilizations such as the Sumerians, Assyrians, and Babylonians developed a **composition of beer** that **closely resembles modern varieties**. The Babylonian beer, referred to as "**bi-se-bar**," was primarily made from **barley and emmer wheat**, an ancestor of modern wheat, and certain varieties were further enriched with **honey or dates**.¹³

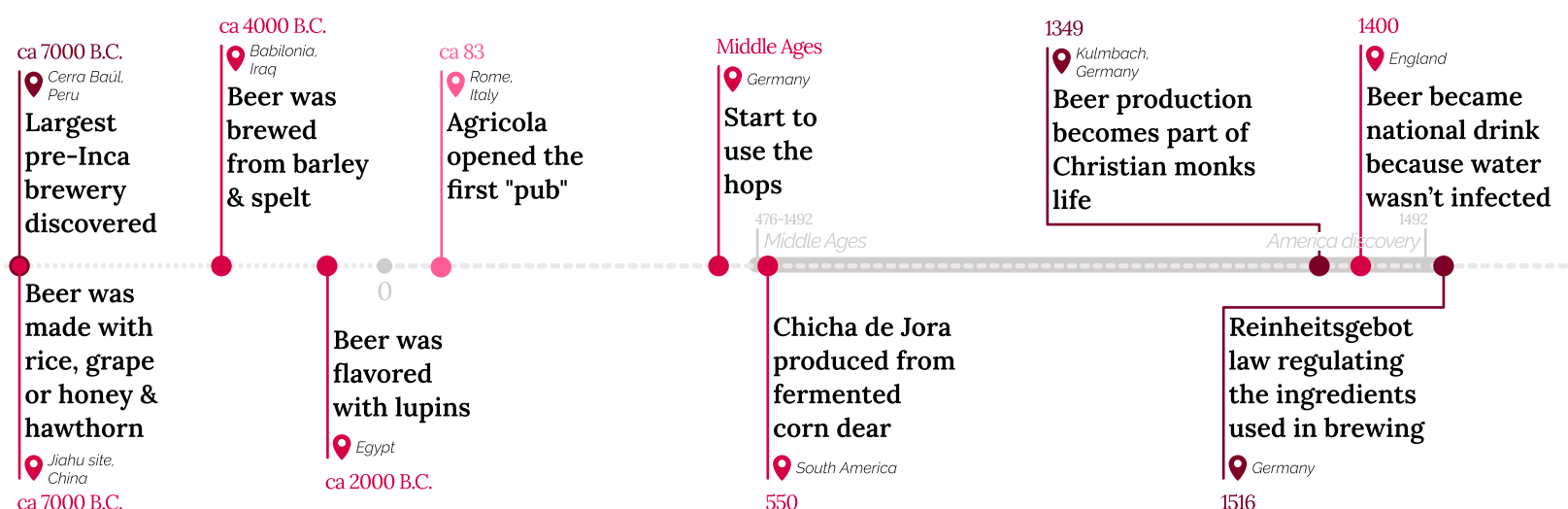
There are also numerous traces of pottery, found at the **Godin Tepe site**, located in present-day Iran and dating from **between 3500 and 3100 B.C.**. Among these, a **jug** with a wide opening and grooves containing a **yellowish resinous substance** referable to **calcium oxalate**, a **byproduct of barley beer production**, was found.¹⁴

Further evidence of beer production is found in Egypt **around 2000 B.C.**. In **Egypt**, beer was refined with the **addition of lupins** for flavoring and was known as "**zythum**".¹⁵ The use of such brew, which became the **Egyptian national drink**, was so widespread that it was **considered medicinal** which, diluted with water and honey, could even be used for weaning infants.

Over time, thanks to the intense trade among Mediterranean countries facilitated the spread of beer, along with spices and knowledge, to Europe. The **Greek and Roman empires** began to **appreciate and produce beer**. Evidence of this can be found in the **etymology** of the term beer, which derives from the **German word "bier"**,¹⁶ itself derived from the **Latin bibere**, meaning to drink, or from the **noun biber**, meaning drink, beverage.¹⁷

Although Northern Europe, inhabited by **Celtic and Germanic peoples**, has long been renowned for beer production and consumption, the beverage was also known and appreciated in ancient Italy. The **Etruscans** were the first to **taste beer**, followed by the Romans. Despite being **considered** a lowly drink and **compared by Tacitus** in his work "*Germania*" to "**vinus corruptus**",¹⁸ referring to spoiled wine, beer became **widely consumed** in **ancient Rome**. The governor of Britannia, **Agricola**, who spent part of his life in Britain, **brought brewers back** to Rome in **83 A.D.** to **open a brewery** at his villa. Furthermore, as in ancient Egypt, beer in ancient Rome was **consumed during meals** and used for **medicinal purposes**.¹⁵

It was, however, in the Middle Ages-historical period from 476 A.D., the year of the fall of the Western Roman Empire, to 1492, the year Christopher Columbus discovered America-that



the drink underwent a momentous change. In what is now **Germany**, **hops were introduced** to flavor beer. While **beer production** in Germany **around 1349** took place in **monasteries**, in **England** it was a **household activity**. The widespread production of beer across Northern Europe, coupled with its boiling process which **eliminated bacteria**, led to it becoming the **national drink of England** by the **1400s**.¹⁵

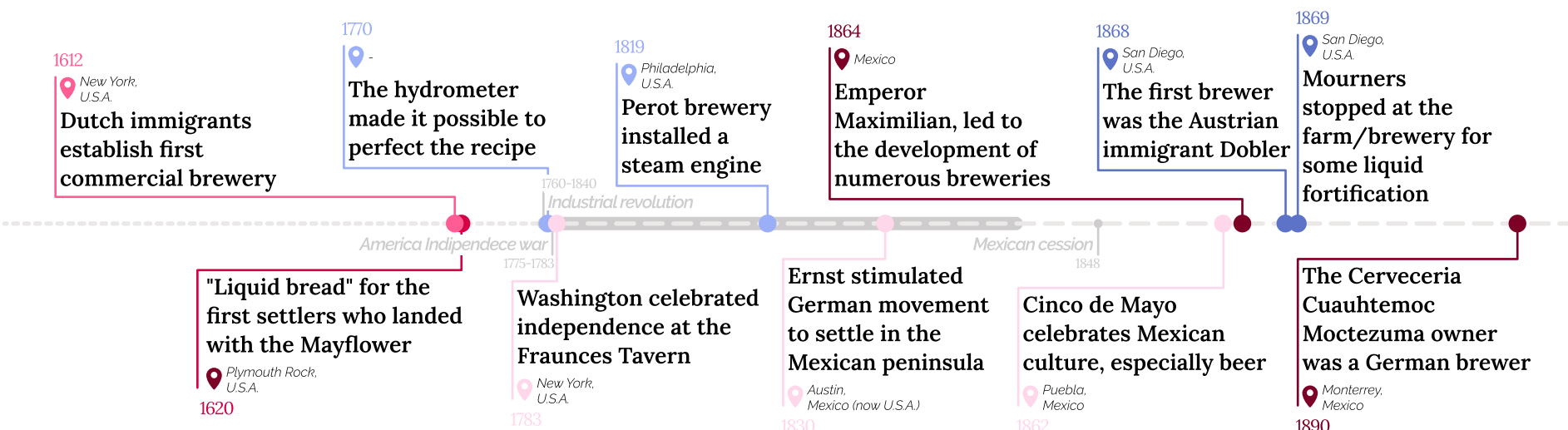
In **1516**, **Duke William IV of Bavaria** issued the **Reinheitsgebot** decree, stating, "In all cities, markets and in the country, the **only ingredients used** for the brewing of beer **must be Barley, Hops and Water**." This decree not only regulated the permissible ingredients but also **set the price** at 1 pfennig per Maß (1.06g liters) from April to September and a maximum of 2 pfennig for the rest of the year. Prior to this decree, brewers had started adding additives to increase the alcohol content while maintaining a pleasant flavor. Public outcry led to the 1516 Reinheitsgebot decree, which codified purity and integrity in brewing.³

the overseas landing

The **16th century** was marked by the **sporadic movement** of the first groups of English, Spanish, and French settlers toward **North America**. It was at the end of the century and the beginning of the 17th century that settlers established the **first permanent settlements**: the English along the northeast coast, in what is now Virginia; the French in the southeast along the Mississippi River; and the Dutch on the coast where they founded the village of New Amsterdam, present-day New York. With the establishment of the first colonies, the **history of beer** in America also began, and the **first breweries** emerged in the villages, such as the one **founded by Dutch settlers Adrian Block and Hans Christiansen in New Amsterdam in 1612**.¹⁹

Among the early settlers were the Puritans, who arrived in America **aboard the Mayflower in 1620** and landed at Plymouth Rock. Among the travelers' accounts, the **lack of "liquid bread"** was frequently mentioned, as drinking beer also meant consuming sterilized water in a place with no infrastructure.¹⁹ However, it was not long before the thirteen **English colonies proclaimed independence** from the motherland, leading to the outbreak of the **American Revolutionary War in 1775**. Within three years, other American colonies joined the fight for independence. Key figures in the revolutionary movement included Thomas Jefferson, Benjamin Franklin, and George Washington. At the end of the war in **1783**, **Washington celebrated** with his officers at **Fraunces Tavern in New York**.¹⁹

With the advent of the **Industrial Revolution** - spanning from 1760 to 1840 - the world experienced a technological revolution that led to the **modernization and development of various machinery**, as well as production processes due to **numerous scientific discoveries**, particularly in chemistry. In the beer sector, one of the most significant inventions, in addition to the steam engine which allowed factories to be independent of water power and thus be established away from rivers, was the **invention of the hydrometer in 1770**. This instrument **optimized the beer production process**, enabling production from a **mix of different malts** to perfect the recipe and physical



characteristics such as color.²⁰ Steam engines began to be used in a variety of fields, and even the brewing industry saw the **first steam engine** to be used in **1819** at **Frances Perot's Philadelphia brewery**.²¹

Around **1860**, the beer industry in America had significantly developed, particularly in **New York and Pennsylvania**, which together had **1,260 breweries** producing over one million barrels.¹⁹

Looking across the border, **Mexico** also saw intense colonization, first by the French, who failed, and then by the Spanish. **Beer-like beverages** were already produced in **native communities** and were supplanted with the **mass arrival of German immigrants** during the 19th century. In particular, during the **1830s**, **Friedrich Ernst**,²² a German immigrant settled in Austin's colony, which was part of Mexico before 1848, **persuaded** many Germans **to move** to Mexico, bringing with them their dietary habits, including beer.

During the **French Empire's** attempts at colonization, **several battles** took place in the country, including the **Battle of Puebla on May 5, 1862**. The unexpected outcome, which saw the Mexicans defeat the French, was widely celebrated throughout the country.²³ Today, this event is **commemorated** by celebrating Mexican culture, particularly the **lager beer** that became popular two years later with the appointment of Ferdinand Maximilian as Emperor of Mexico.

Emperor Ferdinand Maximilian endeavored to expand Western culture in Mexico, and **his passion for lager beer** led to the **development of several breweries** across the country, which over time characterized Mexican beer production.²²

The significance of mass German immigration is evident with the founding of one of Mexico's main breweries, **Cerveceria Cuauhtemoc Moctezuma**, established in **1890** by **German Wilhelm Hasse**, which produced much of the beer popular among the population.²² At the same time, it also **produced bock-style beers** for Hasse and other German immigrants, which eventually began to be appreciated by Mexicans.

The history of Mexican breweries is closely linked to that of the United States, as production shifted to the neighboring country following the Volstead Act. Enacted in **1919**, the **Volstead Act prohibited the production and distribution of alcoholic beverages** with an alcohol content above 0.5% in the U.S., initiating the **Prohibition era** from 1920 to 1933.²⁴

Meanwhile, in Mexico City, **Cerveceria Modelo** was **inaugurated in 1925**, producing **lager-style beers** and a **pilsner-style line** called Modelo Especial.²² In **1953**, a significant scientific discovery led to the **evolution of machinery** in beer production: **Coutts** discovered **continuous fermentation**, allowing the fermentation process to be managed in **closed tuns**, protected from oxygen and possible bacteria.²⁰

In the post-World War II era, alongside the history of these breweries that became industrial-scale producers, there was a contrasting **revolution in craft beer**. This movement was led by **microbreweries and brewpubs** with small-scale production characterized by **experimentation and innovation**, as well as a **return to traditional beer styles** often forgotten by large industries and the use of local raw materials to enhance the beer produced. While in the USA, the beginning of this movement dates back to **1965**, with Fritz Maytag, who purchased the **Anchor Brewing Company in San Francisco**.²⁵



a focus on the region

Focusing on the history of beer in the analyzed region, specifically between San Diego and Tijuana, it is evident that its roots were **first established** in San Diego, subsequently **influencing its development** in Tijuana.

The history of beer in San Diego begins in **1868**, when **Christian and Martha Dobler** decided to **open** a brewery, initially named **San Diego Brewery** and later Pioneer Brewery, **on their farm** in Chollas Valley. Christian Dobler, an Austrian immigrant, had learned the craft of brewing in his native country from his father, who also produced beer in Austria.²⁶ Prior to this, there is no record of other breweries in San Diego, with beer only being **imported from the northern United States**. The exact location of this brewery has been lost over time, but it was likely **near the Mt. Hope Cemetery**, opened in **1869**, as there are accounts of **people returning** to what was then New Town, now Downtown, **finding comfort** in drinking the beer.²⁶ The following year, Dobler, in **collaboration with Philip Wedel**, established the **City Brewery and Depot**, a brewery easily accessible for selling their beers.²⁷ Lastly, a **second brewery**, situated near the first, **opened** in San Diego, as reported by the Daily San Diego Union in **1872**.²⁶

After the deaths of Dobler and his partner, the brewery was sold and renamed **City Brewery Saloon and Beer Gardens**, becoming one of the first **prototypes of a brewpub**. However, it did not last long as many people left the city in **1886**.²⁶

In **1896**, the **San Diego Brew Company** was established, thanks to the investment of several prominent figures in the city, including the developer of New Town. This brewery thrived, becoming the **largest manufacturing entity** in San Diego County.²⁶ The brewery's advanced **refrigeration system** allowed it to **produce lager-style beers** in a region with a hot climate.

In **1915**, the **Mission Brewery Company** was founded, producing two styles of lager beer on behalf of San Diego Brewing, which had changed its name to San Diego Brewing Consolidated Co. After this initial production, Mission Brewery began making a **non-alcoholic beer** called "**Hopsky**".²⁶

At that time, San Diego had about **seven breweries** and **fifty-five saloons**, which **all closed with the advent of Prohibition in 1920**. As a result, residents had to cross the border into Mexico to drink beer and other alcoholic beverages, and also to produce them. In **1928**, the **Casino and Hotel Agua Caliente opened**, **serving beer** supplied by the Mexicali **brewery Cerveceria Azteca**, which **moved** its operations to San Diego after **Prohibition ended**.²⁷

In **1987**, the "**New Brew Wave**" occurred at **Bolt Brewing Co.**, reviving the city's beer industry and earning San Diego the **title of Beer Capital**.

Recent history sees the rise of craft breweries

that now populate the city. After working for a long time in other breweries, **German immigrant Karl Strauss** decided to open his own brewery in **1989**, followed by **Ballast Point** in **1996** and **Stone Brewing Company**. During these years, a new awareness of the beer sector emerged, leading to the creation of **university courses** focused on the industry, such as "**A Sensory Evaluation of Beer**" at UC Davis, taught by the founders of Stone Brewing Company.²⁸

Alongside the new craft breweries, the **culture of homebrewers developed**. These enthusiasts produced beer at home, sharing recipes and following specialized blogs with the advent of the internet. Many of the newer breweries were founded by these homebrewers.²⁸

Starting from the year **2000**, the beer industry **transcended borders**. Influenced by the wave of breweries opening in San Diego, Tijuana also saw **significant growth** in this sector. The real surge, however, occurred **ten years later**,²⁸ driven by local homebrewers who began selling their products from garages and eventually opened **breweries and tasting rooms**. **Collaboration with San Diego brewmasters and raw material suppliers played** a crucial role in the flourishing of the industry.²⁹

An important role in the history of craft beer in the region is played by the **industry associations**,²⁸ namely the **San Diego Brewers Guild** established in **1997**, under which suppliers, producers, homebrewers, the **Asociación de Cerveceros de la Baja** and **Tijuana Homebrew Club** are brought together, as they have allowed craft breweries to survive and innovate in various aspects over time.



5.3

what about today?

Beer ranks the world's most beloved beverages, holding the **fifth spot** among the **most consumed drinks** and the **first among beverages**,³⁰ and **first among alcoholic beverages**.³¹ While this data encompasses both industrial and craft beer, this paper focuses on the latter segment, examining the factors contributing to its success in markets like the United States.

The growth of craft beer is rooted in a series of **interconnected factors**, stemming from both demand and supply, as well as the **actions of pioneers** and **consumer associations**. On the demand side, **consumers' increasing discernment** in seeking beers with unique and distinctive characteristics has been influential. This trend is closely linked to **rising purchasing power** in certain states, making the market more upscale. Additionally, **consumer associations** have played a significant role in **promoting beer culture** and **educating consumers' palates**, thereby increasing awareness and appreciation for craft beers. Concurrently, on the supply side, the **emergence of microbreweries** has filled market gaps left by the homogenization of large industrial beers, reflecting a growing **interest in local products, sustainability**, and a **backlash against globalization**. These factors have shaped the landscape of craft beer, demonstrating how the interplay between demand, supply, and community support has fueled its growth and dissemination.²⁵ Market studies confirm: *"Artisanal beer is becoming increasingly popular. Craft breweries are known for their frequent experimentations with different ingredients to give a distinct flavor."*³²

Despite forecasts indicating that the global beer market will grow at a compound **annual growth** rate of **7.0% from 2022 to 2030**,³² reaching USD 1,250 billion by 2030, the **local nature** of craft beer makes it **difficult to estimate the impact globally**. However, looking at three separate states, starting with Italy, where the research began, California and Mexico, it is evident how the growth of this sector is influencing the global economy.

While Italy's craft beer market **doesn't boast a long tradition** compared to other states, **recent years** have seen **significant growth**. *"Fino alla fine degli anni '90 i birrifici artigianali in Italia erano pochi e si potevano contare sulle dita delle mani, mentre oggi ce ne sono più di 700."*³³ (trans. "Until the late '90s, artisanal breweries in Italy were few and could be counted on one hand, whereas today there are more than 700.")³³ A more recent data from the Registro delle imprese CCIAA, reports that: *"nel 2022 le realtà che producono birra in Italia hanno raggiunto le 1.326 unità occupando un totale di 9.612 addetti diretti, con una crescita rispetto al 2015 del 104% in termini di birrifici e del 22% in termini di addetti."*³⁴ (trans. "in 2022, breweries producing beer in Italy reached 1,326 units, employing a total of 9,612 direct workers, with a growth of 104% in terms of breweries and 22% in terms of employees compared to 2015.") Therefore, overall, while it may not have a defined national beer culture, production data still position Italy as one of the **emerging nations** in this sector.³⁵ This is further evidenced by **Beeronomics'** choice to hold its next congress in Italy, in Milan, at **Bicocca University** from June 19 to 22, 2024.³⁶

As for the United States and Mexico, these will be analyzed in detail in the following paragraphs.

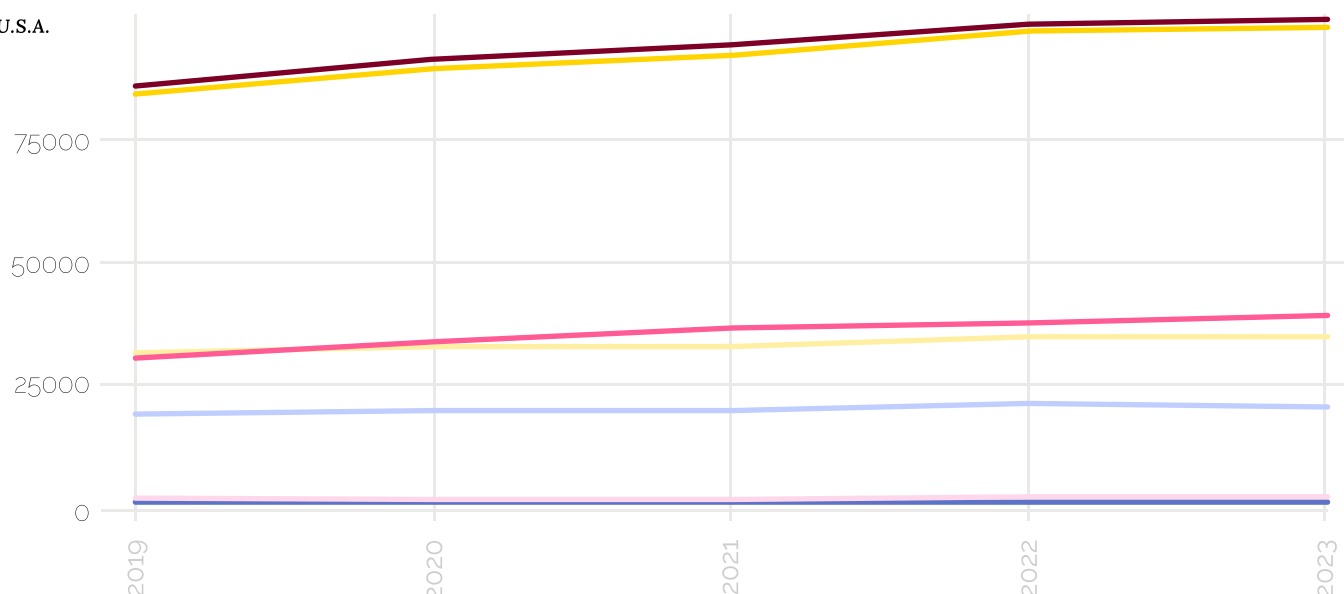


Hodad's. (March 13, 2024).
made by the authors

The numbers of the industry in U.S.A.

legend

- Total U.S.A. Breweries
- Craft
- Taprooms
- Brewpubs
- Microbreweries
- Regional
- Non-Craft



Trends in USA

"Since the **late 1970s**, the craft brewing industry **has grown significantly** and today supplies **7.8% of total U.S. beer sales**." ³⁷ This figure becomes even more intriguing when considering the **impact** these breweries have **on the USA economy**. Acting as local players, they contributed an estimated **\$72.2 billion** to federal coffers **in 2022**, while also creating approximately **460,000 jobs**. ³⁸

This substantial influence of craft beer producers on the economy stems not only from increased sales but also from a **more widespread structuring** of the phenomenon. For instance, the **exponential growth** of these breweries in states like **California**, which saw a **rise from 270 breweries in 2011 to over 1,100 craft breweries by 2023**, ³⁹ illustrates how they are becoming "**a ubiquitous feature of the American urban fabric**." ⁴⁰

The interplay between supply and demand continues to affirm the already mentioned trends. In fact, the Brewers Association reports that **in 2022**, craft beer production (**+0.1%**) followed an **upward trend**, while **industrial production** experienced a **slight decrease (-0.3%)**. ⁴¹ Although the change is still minimal, it is also **reflected in consumption**.

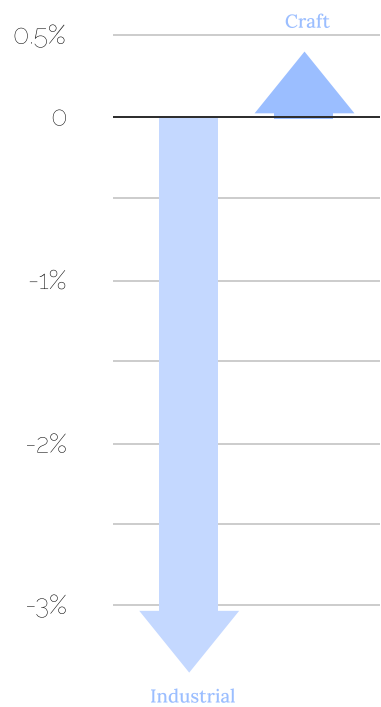
On the demand side, there is a **change** in terms of **age**: beer consumers have changed in the transition from industrial to craft beer. This change is mainly **driven by Millennials**, who show an increasing **preference for craft beer**. They not only influence the production market, but are also inclined to **value the experience** associated with the product, in addition to its **intrinsic quality**. ⁴⁰

Preferring the experience to the mere product itself, there has also been a **change** in the **consumer environment** over the years, the distribution of craft beer, takes place mainly in **Taprooms** (at 40.18%) and **Brewpubs** (at 35.78%), **Microbreweries** (at 21.3% in the year 2022, an increase of 1.4% compared to 2021) and **Regional Craft Breweries** (at 2.74% in the year 2022, an increase of 17% compared to 2021) remain further behind, but still with a growing trend. ⁴¹

Regarding product preferences, a study conducted by **IWSR** for the **Beverage Information Group** reveals clear preference for **Light beers**, followed by **Super Premium**, **Premium**, and **FMBs**, with craft beer ranking fourth in consumption at **304,530 thousand 2.25-gallon barrels**. ⁴²

With regard to drinking times, it is interesting to note that there is **beer-related terminology** that is part of **everyday language**, such as the term "**beer thirty**", which represents the **time of day when drinking a beer** becomes a necessity. In response to the question "**what time is it?**", there's often only one answer: "**it's almost beer thirty**." ⁴³ A **YouGov survey** of 2,747 U.S. adults shows roughly **one in six (16%)** consider **noon** the **earliest acceptable time** to have an alcoholic drink on non-working days, while **one in ten (10%)** say **5 p.m.** ⁴⁴ Furthermore, from the same survey, it is interesting to note that, when asked about their **drinking habits**, most of the respondents declared themselves to be drinkers only on special occasions, or at times of **social gathering**. ⁴⁴

U.S.A. beer production volume.



San Diego
“Capital of craft”

In the United States, **California** stands out as the **leading producer of craft beer**, with a growing trend of such establishments.⁴⁵ Overall, California's craft beer production landscape positions it as the state with the **greatest economic impact** in beer production, **contributing \$9 million**.⁴⁶

Within the Californian context, **San Diego** emerges as a **bustling hub** of brewing activity. Recognized as the **"Capital of Craft"**,⁴⁷ it boasts a noteworthy and globally recognised beer production, thanks also to the breweries' participation in **international competitions** and the subsequent winning of several awards.⁴⁸ In **2020**, San Diego County housed **158 craft breweries**,⁴⁹ with **59** of them affiliated with the **San Diego Brewers Guild** today.

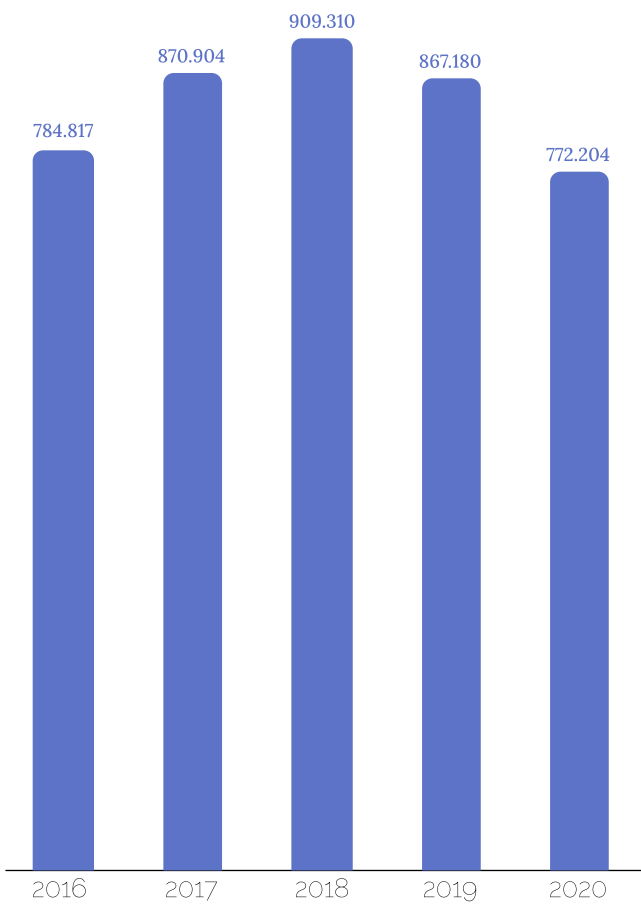
Such a production scene, generates a considerable **economic impact**, creating:

- **3600 jobs** in San Diego County;
- An estimated **value** of **31003747 dollars**;
- With an **added value** of **\$87919411**, contributing to the state's GDP.⁴⁹

San Diego truly **lives up** to its title of **"Capital of Craft"**,⁴⁷ even in the beer sector, as evidenced by the **annual celebration** by the San Diego Brewers Guild, **producing a beer in collaboration** with **seven guild members**.⁵⁰

Beyond statistics, what distinguishes San Diego's beer scene is undoubtedly the **vibrant culture** surrounding it, experienced firsthand during field research. Breweries serve as **community gathering spots**, often **open to all ages** and welcoming to **families and dogs**. Moreover, the city hosts **numerous events and festivals dedicated** to the world of craft beer, attracting enthusiasts from afar, thus fostering both the city's **economic growth** and that of the region.

San Diego Craft Beer Production in bbl per year.



Trends in Mexico

Mexico, with **\$5.4 billion** in **beer exports**, accounting for **34% of global beer sales**, ranks as the **world's leading beer exporter**. This figure primarily pertains to the consumption of **industrial Lager beer**, such as **Corona**, produced and distributed by **Heineken Mexico**.⁵¹ Beer is also "*el principal producto agroalimentario de exportación de México*"⁵² (trans. "Mexico's main agri-food export commodity"), contributing to the **22%** of the agro-industrial **exports** in **2021**. This makes beer a **significant sector** for the country, the most important among alcoholic beverages, employing **49.3%** of the **workforce** and contributing **65%** of the total **alcoholic beverage production**.⁵² This impact is also reflected on the demand side, making beer, particularly industrial beer, the **most consumed alcoholic beverage** in the country.⁵³

The craft beer production and distribution market in Mexico has followed a **parallel path** to that in the United States, **imitating its styles and production techniques** since **1995**.⁵⁴ With the advent of the new millennium, the market expanded more and more, but it is only **since 2011** that **considerable growth** has occurred, from **26 craft breweries** in **2011**, to **630** in **2017**. Currently, There are **1400 craft brewers** operating in the country, with **Jalisco** being the **area of greatest production**.⁵⁵

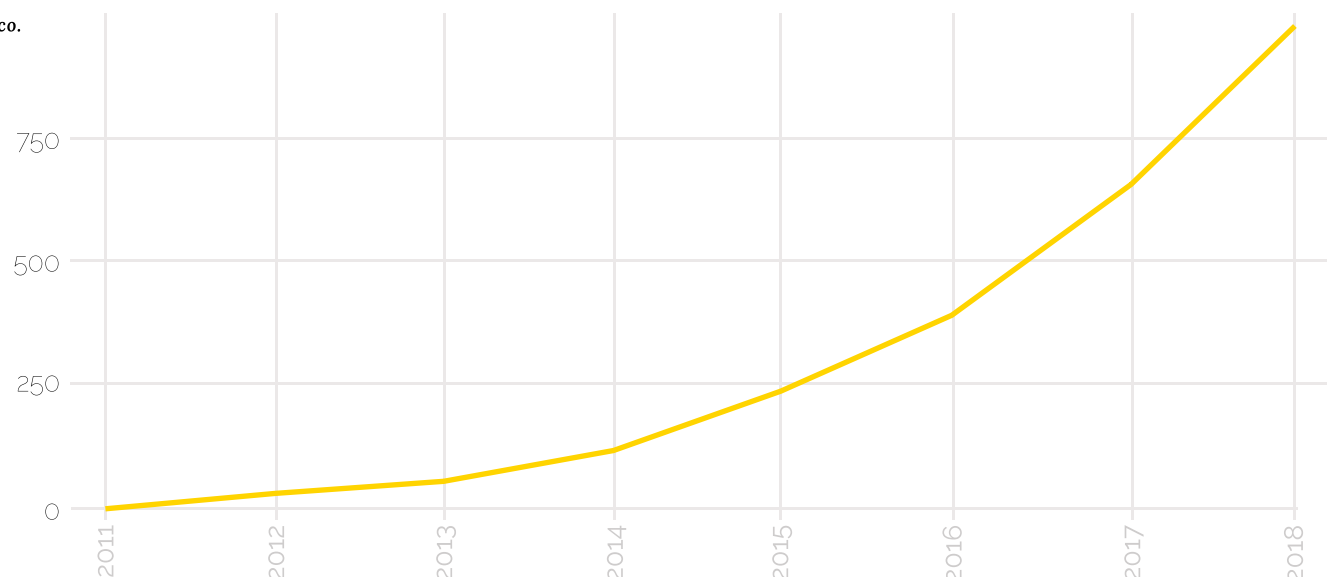
Despite this seemingly exponential growth, the **craft beer market** in Mexico currently holds **only 0.22%** of the **total market**,⁵⁶ with the **remaining share** controlled by **Grupo Modelo** and **Heineken México**. In **2023**, the craft beer market **grew by 11%** compared to the **first quarter of 2022**. This growth was attributed to the **product's increased accessibility**, now more readily available across various **distribution channels**, including **restaurants, bars, retail outlets**, and **online platforms**.⁵⁷ Additionally, government actions in recent years have aimed to counter the **monopoly of large beer production chains** on local distribution, further facilitating market growth.⁵⁸

Regarding consumption habits, it's important to note the most appreciated styles of craft beer. **Approximately 50%** of the beers **follow styles popular in the U.S.**, such as **Pale Ale, IPA, and American Stout**.⁵⁹ Another significant aspect of consumption habits is the **context** in which **beer is consumed**: "*El 65% de las ocasiones de consumo se hacen los fines de semana, siendo el Domingo el día más relevante, seguido del sábado.*"⁶⁰ (trans. "The 65% of consumption occasions take place on weekends, with Sunday being the most relevant day, followed by Saturday.")

A **survey** conducted during a **beer festival in Mexico City** revealed that, out of a sample of 207 consumers, **34.8% prefer craft beer**. The **sample** consisted predominantly of **men aged 25 to 35** with relatively high incomes. However, among the beers identified as "craft", some were actually "industrial," suggesting a limited understanding of the distinction between the two terms, which might not be well defined or are defined ideologically.⁶¹

The same study highlights another important characteristic of consumption habits. Similar to the U.S., **craft beer** in Mexico is **associated with experience**, particularly the pursuit of **authenticity related to the meaning and identity** behind the product.⁶²

Number of Craft Breweries in Mexico.





Tijuana
“Cuna de la
cerveza artesanal”

Among the states producing craft beer, **Baja California** stands out, known as the “**cuna de la cerveza artesanal**”,⁶² (*trans. “cradle of craft beer”*) or “**la capital de la cerveza artesanal de México**”⁶³ (*trans. “the capital of craft beer in Mexico”*). Despite this, the state ranks only **fourth** in terms of **beer production volume**, contributing just **13%**, behind **Jalisco** with **34%**, **CDMX** with **21%**, and **Nuevo León** with **15%**.⁶⁴

Although Baja California is not the largest beer producer in Mexico today, its **historical importance and relevance** in the sector cannot be overlooked. Influenced by nearby San Diego, Baja California began **experimenting** with **craft beer** around **1915**, during **Prohibition**, when the region became a **hotspot for “beer tourism”**.⁶⁵

Currently, the craft beer scene is concentrated in the three main cities of Baja California, with **Tijuana** accounting for **42%**, **Mexicali** **29%**, and **Ensenada** **24%**, with the remainder distributed throughout the region.⁶⁵

According to a **2017 Deloitte report**, Tijuana also boasts one of the **highest numbers of craft beer outlets**.⁵⁴ In recent years, in fact, it would seem that Tijuana is experiencing an **explosion** of the **craft phenomenon**, also due to its increased commercialisation, to the detriment of industrial brands. An **article** in the **Los Angeles Times** reports that there are **120 craft brewers** in the state of **Baja California**, about **40** of which are **located in Tijuana**.⁶⁶

5.4

a culture around

Around craft beer a **real culture** has developed in recent years, **influencing** not only its **growth and development**, but also its **consumption patterns**. *"Drinking craft beer is more than just having a good time, it's a ritual that more and more people are adhering to. Serving the drink in a **special glass**, or **accompanying** each style of beer with **different dishes** to **enhance the flavors**, is something that attracts more and more the attention of the people who came to taste and end up being **part of the experience** in a recurrent way."*⁵⁴

Such culture **reflects the needs** of the consumer population. According to the **Brewers Association**, the largest segment comprises **Millennials**, representing **57% of the market**. When examining this phenomenon through a values lens, one can observe how this market segment is continuously seeking **meaningful experiences**. They are characterized by **confidence**, **creativity**, and **openness to experimentation** and change.¹⁰

Stone. (March 7, 2024).
made by the authors



just consumer?

Other studies demonstrate that the **rise of craft breweries depends** on two main market trends: neolocalism and locavorism.

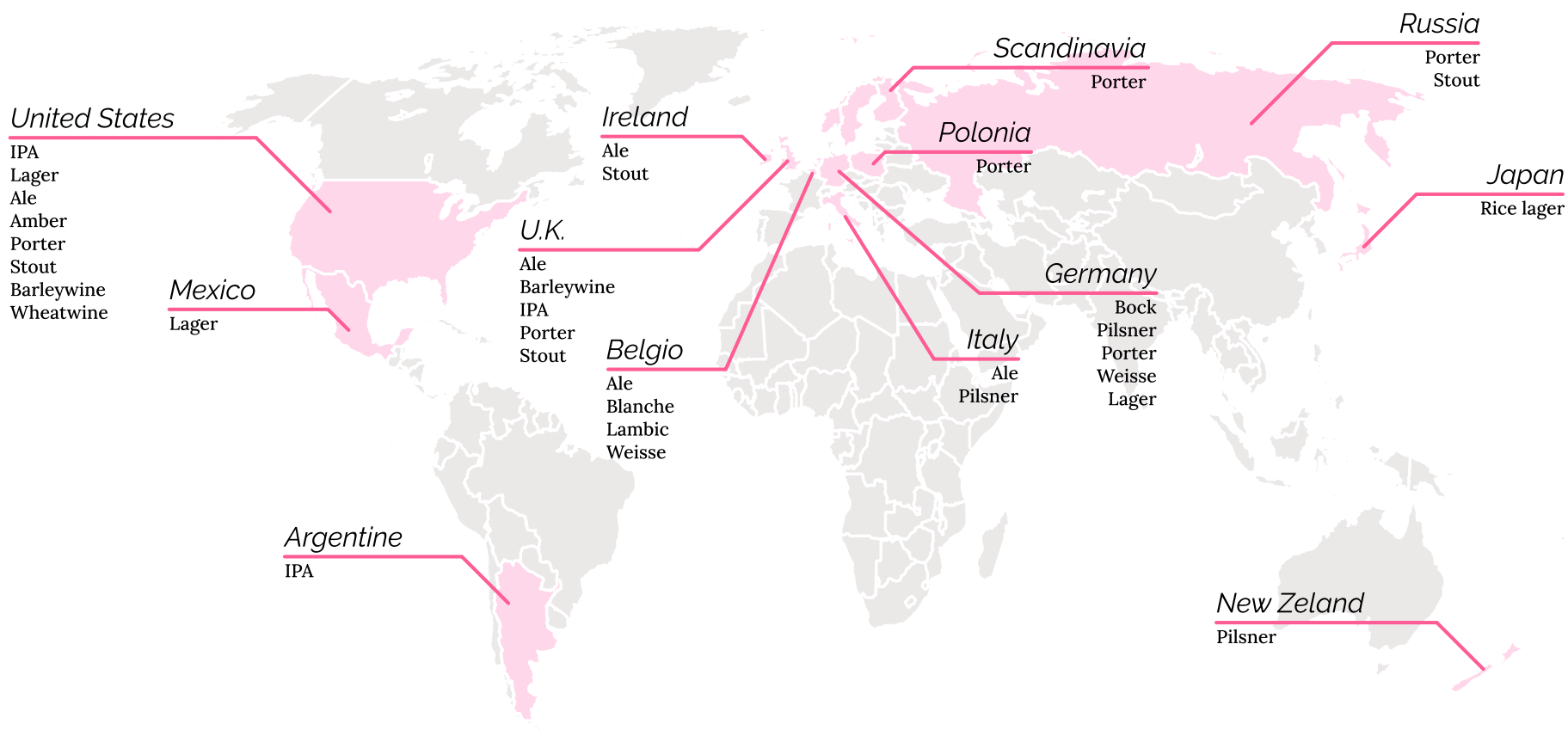
- **Neolocalism** refers to **consumers' preference** for **local products** that reflect the uniqueness of the place of production and strengthen local identity. This trend leads consumers *"to the local people and, thus, consumers expect to get as close as they can to the business owners and to other consumers alike"*.⁶⁷
- The **locavorism**, on the other hand, stems from growing concerns about the **consumption of industrial products** and their **impact on the environment**. *"Jessica Prentice, argued that consuming local food brings **benefits** to its consumers because it is **healthier, fresher, and better tasting**. At the same time, it **reduces the impact** on the environment, given that the logistics involved in the transportation of products are simplified, and it is a way to **support the economies of local farmers and entrepreneurs**. The meaning of local is still under discussion. One reason being the difficulty of defining an exact distance that a product travels to be considered local; however, a 100-mile radius is often used as a reference"*.⁶⁷

The **expansion** of the **craft beer phenomenon** is not only closely related to consumer choices about the food industry, but also to the phenomenon of **beer tourism**.⁶⁸ *"Craft beer tourism involves a **variety of leisure options** such as guided visits to breweries, craft beer and food pairing, festivals, and ale trails; as such, it is gaining importance in the management of tourist destinations"*.⁶⁷ Tourists are attracted to the **unique experiences** and **connection** to the **local area** that breweries offer. By visiting breweries for tastings, food and beer pairings, festivals, and gastronomic routes, visitors can **connect with local realities** and take home a piece of the experience by purchasing products and merchandise.⁶⁹

Analyses reveal a significant difference between a craft brewery, a brewpub, and a regular pub or bar. Craft breweries stand out as spaces for

social gathering and community building. This **inclusivity** extends to **families, children, and dogs**, with **various activities** tailored for each category. **Brewpubs** have been considered true **"Third Places"** in some contexts, such as the American one: *"You won't find people hypnotized by **giant television screens** blaring sports or their smartphones at places like this. You'll find them talking at **community tables**, maybe playing a game like Cards Against Humanity, Scrabble or cribbage, or intensely removing one piece at a time from a giant Jenga set."*⁷⁰

In conclusion, the **culture of craft beer** represents a continuously **expanding and evolving phenomenon**, **redefining the concept** of **"drinking beer"** into an **experience rich in flavors and connections**, with a significant **impact** on the **local economy**. However, to further explore this topic, it is necessary to delve into the reasons for the success and uniqueness of this culture, examining in detail some of the aspects that characterize it and root it in a solid system of values and experiences.



beer styles

There are **many types** of beer worldwide, distinguished by their **physical characteristics** and the **raw materials used**. The classification of beer dates back to ancient times when the **Egyptians** began **naming** the different **beer varieties** they produced, continuing throughout history. It was only in modern times that **beer styles** were thoroughly analyzed. In **1989**, brewer, writer, and journalist **Fred Eckhardt** published his **guide to beer styles**, "*The Essentials of Beer Style*".⁷¹ This work was later adopted by the **Beer Judge Certification Program (BJCP)**, which now certifies beer judges and maintains updated style guidelines.

The **primary classification** of beer, and the most general one, **considers** the type of **yeast used**. Based on the yeast type, beers can be classified into **Ales**, which use **top-fermenting yeast** (*Saccharomyces cerevisiae*); **Lagers**, which use **bottom-fermenting yeast** (*Saccharomyces pastorianus*); and **wild or spontaneously fermented** beers. The latter category was added later and, contrary to its name, this fermentation **is now controlled** and includes beers fermented with **bacteria or non-Saccharomyces yeasts**.⁷²

According to the **Style Guidelines** of the **2021** by BJCP, new styles are defined by **four basic sensory elements**: **appearance, aroma, flavor, and mouthfeel**.⁷² The most known families of styles worldwide, and foundational for describing new styles, are deeply rooted in the culture of their country of origin.

Hailing from **England**, **Porter** and **Stout** beers are defined by their **rich, dark malts**. Porters are typically darker, while Stouts range from deep brown to black. Both styles share **flavors of coffee, chocolate, and licorice**.⁷³

The **Pale Ale** family also **originated in London**, featuring a **"pale" color** in contrast to the more common amber beers produced in England, and a **hoppy bitterness**.⁷³ The **IPA (India Pale Ale)** family evolved from Pale Ales. London brewers created these **stronger, hoppier beers** for their **colonies in India**. This style, which disappeared for a while, was **revived by Americans** and now is a cornerstone of craft beer production.⁷³

The **Wheat beer** family, originating in **Germany** and known there as *Weissbier*, is known for its **refreshing quality**. The key characteristic of this style is the use of **wheat malt in addition to barley malt**.⁷³

Another traditional **German** family is the **Bock beers**, known as typical German winter beers. They have a **high alcohol content** and a **sweet taste** due to the **dominant malt component** over hops.⁷³

From the **Czech Republic**, the **Pilsner** family features beers with a **light color** from the use of **pale malts** and typical **low-fermentation yeasts** of the region.⁷³



beer tasting

To fully appreciate a beer, whether for judging or enjoyment, the **tasting process** should follow a precise analysis consisting of three phases: **visual, olfactory, and gustatory**.

The **visual analysis** assesses the **color and texture** of the **foam**, the **fineness and persistence** of the **carbonation**, which should last throughout the tasting, and the **beer's color**, which depends on the malt used in production.⁷⁴

The **olfactory analysis**, the most complex phase, evaluates the **primary aromas**, determined by the raw materials used, and the **secondary aromas**, which are more complex and result from fermentation. This analysis focuses on the **persistence and intensity** of the **aroma**, using **specific descriptors** such as hoppy, fruity, malty, herbal, and floral.⁷⁴

The **gustatory analysis**, finally, evaluates the **persistence** of the **beer's flavor and aroma**, primarily based on the bitterness from the hops and the residual sugars from the fermentation process and malt.⁷⁴

During beer tasting, the **choice of glassware** is crucial, as its design is intended to **enhance the characteristics** of the beer style being tasted.

The glass commonly used for **competitive tastings** is the **ISO glass**,⁷⁵ the same used for wine tasting. This glass has a **neutral design** that doesn't distract from the beer's characteristics; moreover, its **wide bowl** allows for a **clear visual analysis**, while its **curved walls** facilitate an **adequate olfactory analysis** by directing the aromas toward the nose.

A significant innovation in tasting glassware occurred in **2006** with the introduction of the **Teku glass**⁷⁶ designed by **Teo Musso**, owner of the Baladin brewery, and **Lorenzo Dabove**, known as Kuaska, Italy's foremost beer expert, and **produced** by the **German company Rastal**. The shape of this glass **emphasizes the bowl and walls**, enhancing the **development of foam, carbonation**, and the **delivery of aromas** to the taster's nose.



Furthermore, in addition to tasting glasses for competitions, several specific glasses were developed for the main beer styles. Among the most **commonly used** beer glasses in pubs are the **Imperial pint** and the **American pint**,⁷⁷ suitable for tasting all styles of beer. The former has a **thick base, flared sides**, and a **capacity of 16 oz**, while the latter **differs** by having a **capacity of 20 oz** and a **bulge near the top**, making it **more ergonomic and stackable**.



The **Snifter glass**,⁷⁷ commonly used for tasting spirits like brandy and cognac, is also used for beers such as Barleywine, Imperial IPA, and Imperial Stout. The **wide bowl** of the glass **enhances** the **beer's aromas** and allows for **easy swirling**.



The **Tulip glass**⁷⁷ is similar in shape to the competition tasting glass and is mainly used for **strong and hoppy beers** like Scottish Ale, Belgian Ale, Barleywine, Saisons, Gueuze, Sour Ale, and Wild Ale. Its design features a **narrowing at the top** to enhance aroma tasting and an **outward-curving rim** to promote foam development.



The **beer Goblet**,⁷⁷ mainly used for tasting Belgian ales in all their variations (doubles, triples, quadruples), is characterized by an **etching at the bottom** of the glass that helps **maintain carbonation**.



For IPA and Stout styles, specific glasses like the **IPA glass** and the **Stout glass** have been designed.⁷⁷ These glasses resemble elongated wine glasses, with the IPA glass featuring **ridges at the bottom** to release the beer's aroma when swirled.



Pilsner and Weizen glasses⁷⁷ are both **tall, slender, and flared at the rim**, highlighting the beer's color, carbonation persistence, and foam formation. The **narrow bottom** of these glasses prevents sediment from rising to the surface. The Pilsner glass is primarily used for Pilsner, Blonde Ale, and Pale Lager styles, while the Weizen glass is for Wheat ales, Hefeweizen, Dunkelweizen, Weizenbock, and Gose beers.



The **Dimple beer mug**, known for its durability, is a **thick glass mug** that can be decorated with motifs. This type of glass is perfect for tasting all beer styles, especially lagers, stouts, and porters.



Among the more traditional and distinctive beer glasses are the **Stange glass**,⁷⁸ **small 4.5 oz** German glasses typically **served on a Kranz tray**, used for beers like Kolsch, Czech pilsners, Altbier, Lambics, and Gose. Also rooted in German tradition, especially **linked to**

Oktoberfest, are **Beer boots**, shaped like boots and **capable of holding between 2 and 5 liters** of beer, typically used for serving festival beers like Wheat ale, Hefeweizen, Dunkelweizen, Weizenbock, and Gose.

Beer tasting for pleasure can be accompanied by food or not. It can take place in various venues like **brewpubs**, where **beer is produced**, sold, and **served with food**, or **tasting rooms**, where beers of all types can be **sampled**. These venues can be **affiliated with a brewery** or sell various craft beers. Beer tastings can involve sampling different beers using **flight glasses**, small **4 oz glasses** served on trays with holes for the glasses. These are served in sets of four, filled with the **beers chosen** by the user.

As for food and beer pairings, there are no strict rules to follow. Pairings can be made by **contrasting the food's flavor** with the beer's aroma or by **complementing flavors**, avoiding extremes like pairing very delicate foods with strongly flavored beers.⁷⁹

The Brewers Association created the **Craft Beer and Food Pairing Guide**, which includes guidelines for pairing food components with the six categories of beer flavors.

According to the guide, for a balanced pairing with **grain-flavored dishes**, **light and crisp beers** with a prominent hop aroma, like American Amber lagers or Bohemian-style Pilsner, are recommended. For **rich-flavored dishes** with beans and legumes, **malty and sweet beers** like English Brown or German Hefeweizen balance the dish's saltiness and acidity. For **bold-flavored shellfish dishes**, **fruity and spicy beers** like Belgian Saison or German Hefeweizen enhance the natural saltiness and sweetness of the dish. For **dishes featuring meats and root vegetables**, **sour and tart beers** like American Brett or Belgian Flanders enhance umami flavors, while **hoppy and bitter beers** like American Pale Ale and Brown Ale pair well with **chicken dishes**, where the fat neutralizes the strong hop aroma. For **dishes dominated by butter and oil flavors**, **hoppy and bitter or dark and roasty beers**, like American Black Ale or English Brown Porter, balance strong flavors. For **grilled vegetable dishes**, **dark and roasty beers** like Irish Dry Stout enhance umami, balancing the dish's sweetness and richness. Finally, for **chocolate-based desserts**, **malty and sweet or dark and roasty beers** like German Bock or Baltic Porter enhance umami by adding earthy notes to the dish.

Opportunities to test various beer styles abound worldwide, in the form of **festivals or competitions**. Notably, events in the San Diego-Tijuana region are highlighted for 2024 and the past year, 2023. These annual events allow regional and other craft breweries to showcase their best beers or special lines made for the occasion.

beer creativity

"Since its revival in the early 1980s, the craft brewing industry has been a continual **innovator in the flavor, body, and complexity of beer**".⁸⁰ However, the **tradition of creativity** in the beer industry dates back long **before the 1980s** and can be attributed to **various factors** that have influenced its **development and dissemination**, as well as the modes of consumption themselves.

Evidence of **creative experience** in the beer industry can be found in the **very glasses** in which beer is served. As previously mentioned, these glasses are the **result of meticulous research** not only on consumption habits but also, and most importantly, on **enhancing flavors and aromas**.

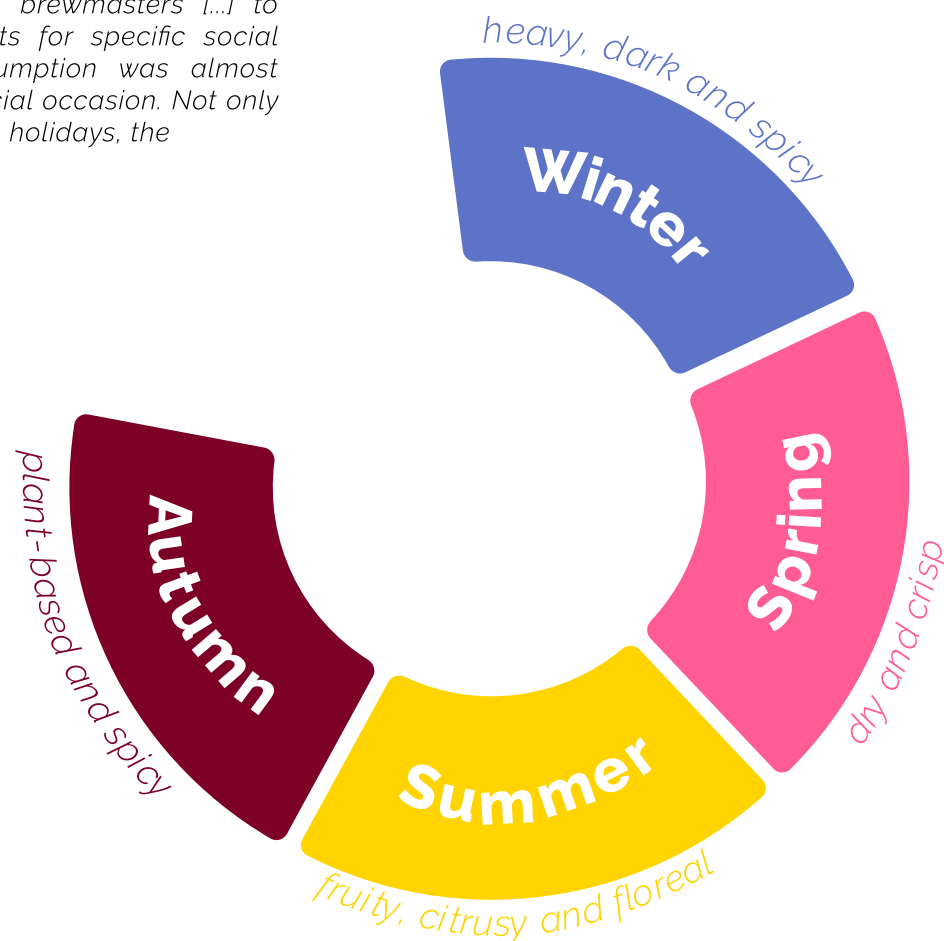
Another aspect of the **intrinsic creativity** in the industry is the constant search for **locally sourced ingredients**, such as beers derived from **rice fermentation**, typical of Japan,⁸¹ or **malts derived from wheat**, essential for Belgian white beers.⁸² Crucial in this regard are the **experiments** conducted through **seasonal beers**. *"L'impossibilità di produrre la stessa birra in stagioni diverse, spinse [...] i mastri birrai della Baviera, [...] a dedicare grande attenzione alla produzione di prodotti in funzione di determinati eventi di carattere sociale, nel corso dei quali il consumo era quasi d'obbligo e diventava occasione di socializzazione. Non solo l'Oktoberfest, ma anche le ricorrenze di carattere religioso, il matrimonio di un principe, una nascita, l'arrivo di una stagione e molto altro".*⁸³ (trans. "The inability to produce the same beer in different seasons drove [...] Bavarian brewmasters [...] to focus on producing products for specific social events, during which consumption was almost obligatory and became a social occasion. Not only Oktoberfest but also religious holidays, the

marriage of a prince, a birth, the arrival of a season, and much more"). This custom quickly spread throughout Europe, with successful examples such as England with its bitter beers made from **special barley**, Belgium with its **extensive use of spices**, and Scotland with herbs from the moors.⁸³

Today, there are **several types of seasonal beers**, which can be classified on the basis of their characteristics:

- **Spring beers** are associated with **complex and bright flavors**, reminiscent of longer days and the possibility of outdoor enjoyment;
- **Summer beers** feature **fruity, refreshing, and thirst-quenching flavors** typical of light beers;
- **Autumn beers** are dedicated to the **aromas of maple and pumpkin**, as well as spicier flavors designed to warm the early cold days;
- **Winter beers** are the **most robust, presenting notes of coffee and chocolate**, offering a comforting experience through the beverage.⁸⁴

The success factors for these types of beers are rooted not only in **technological limitations** and the unavailability of ingredients but also in the desire to **create moments** of sharing and savoring all the flavors. The need to respond to these demands has implicitly led to a creative response from brewers. The search for **new raw materials**, the use of **seasonal ingredients**, and the **experimentation with new recipes** have contributed to the **evolution and diversification** of the beer landscape.



Beer sector

collaboration becomes a drink

Legend

- U.S.A.
- Mexico
- Reading lines

“ Beer is the **fifth** most consumed beverage in the world! „

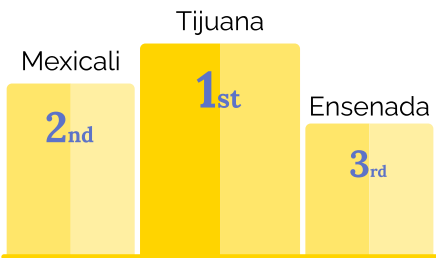
OECD, 2005, Health Data.

Mexico
Beer number

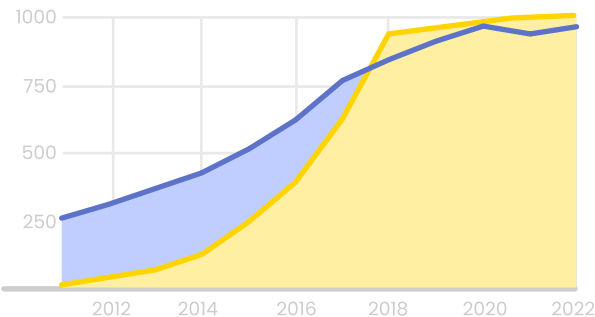
34%
Of total global sales

1st place
Among beer exporting countries in the world

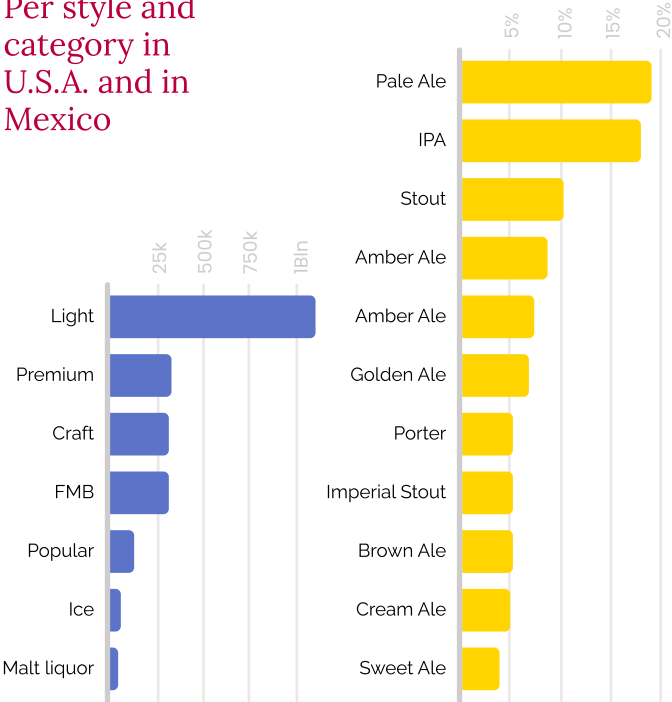
Main craft breweries
Placed in Baja California



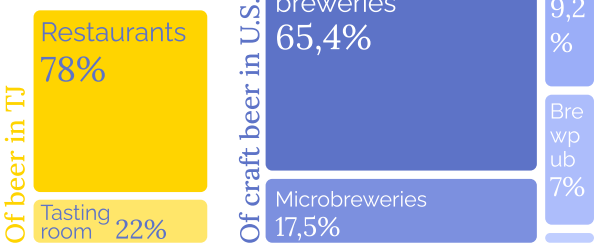
Craft breweries number
In the past 10 years



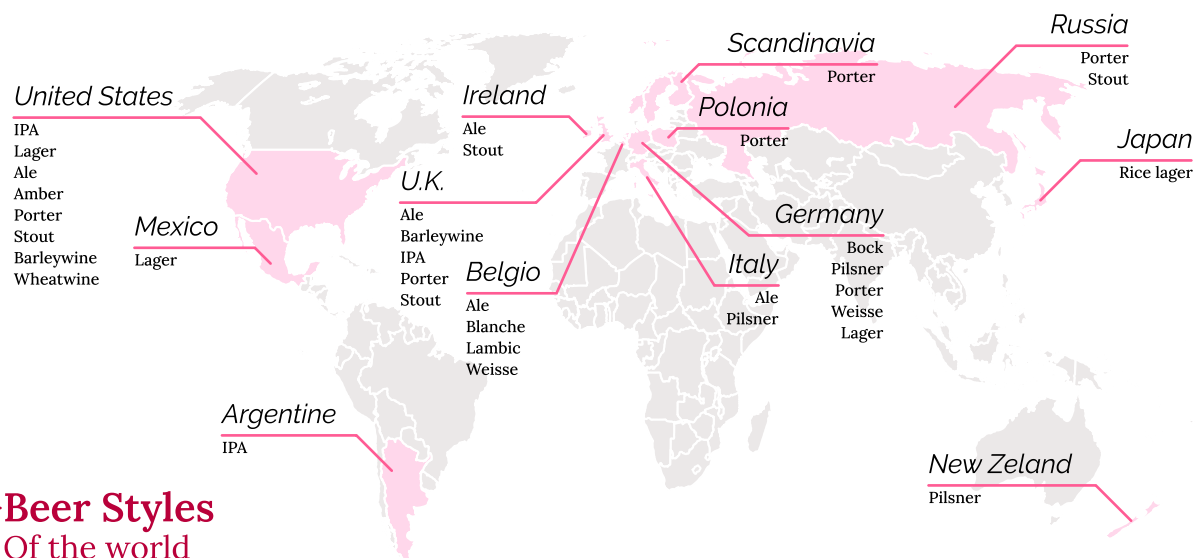
Beer consumption
Per style and category in U.S.A. and in Mexico



Distribution
Of beer

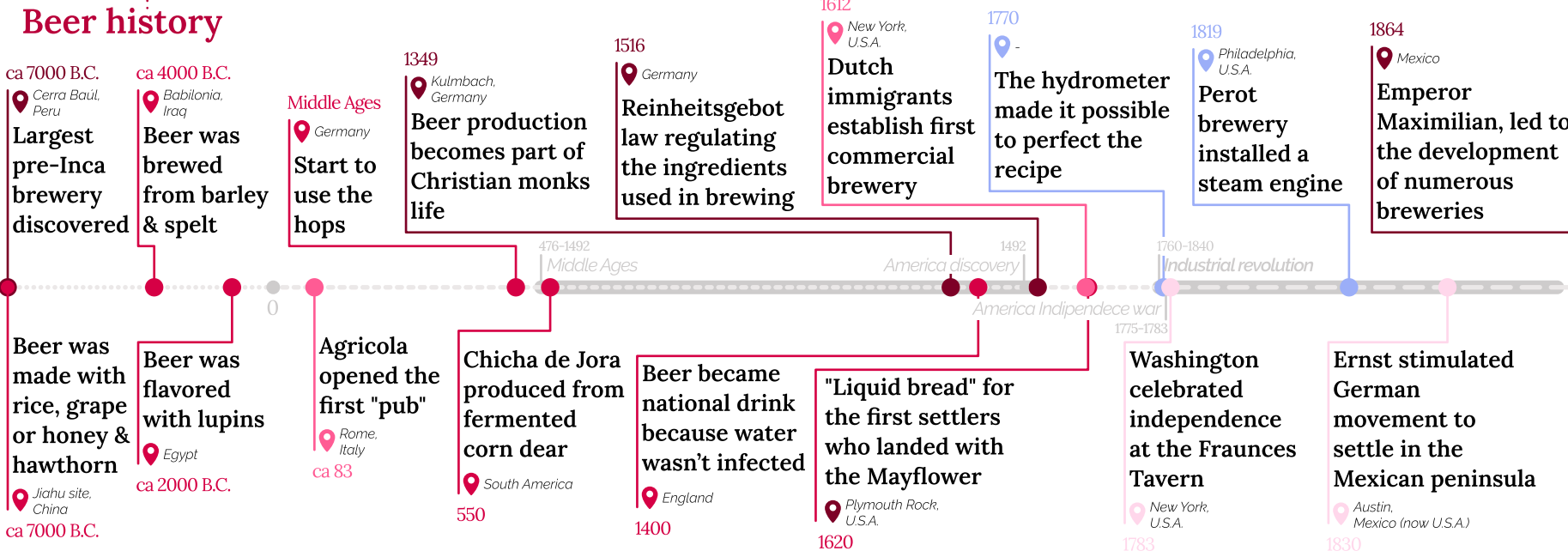


Hops
amount x style



Beer Styles
Of the world

Beer history



Festivals & Competition



“This shift is driven primarily by **Millennials**, who demonstrate a growing **preference for craft beer**. They are not only influencing the production market, but are also inclined to **value the experience** associated with the product, in addition to its inherent quality.”

Aparidian, Nilsson, Reid & Wartell (2022)

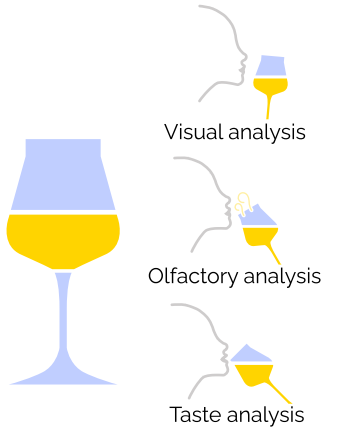
Seasonal beer
Flavors & malts



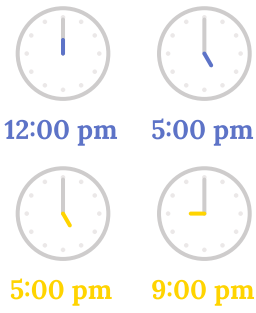
Beer tasting
How to do

“In the tasting glass, beer describe a hemisphere by determining a **headspace** to allow the full **development of aromas**. The glass curved walls direct odors to the nose.”

Enciclopedia della birra



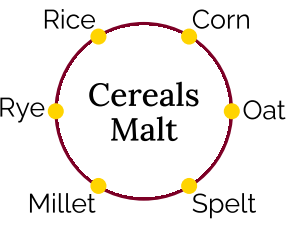
What time is it?
It's almost beer thirty



Seasonal beer
The different kind of malts

“Seasonal style is related to life in the fields, with **production** being carried out on farms. Brewed with **homegrown yeast**, with the addition of **spices**, and with the addition of from **locally available malts**.”

Baladin

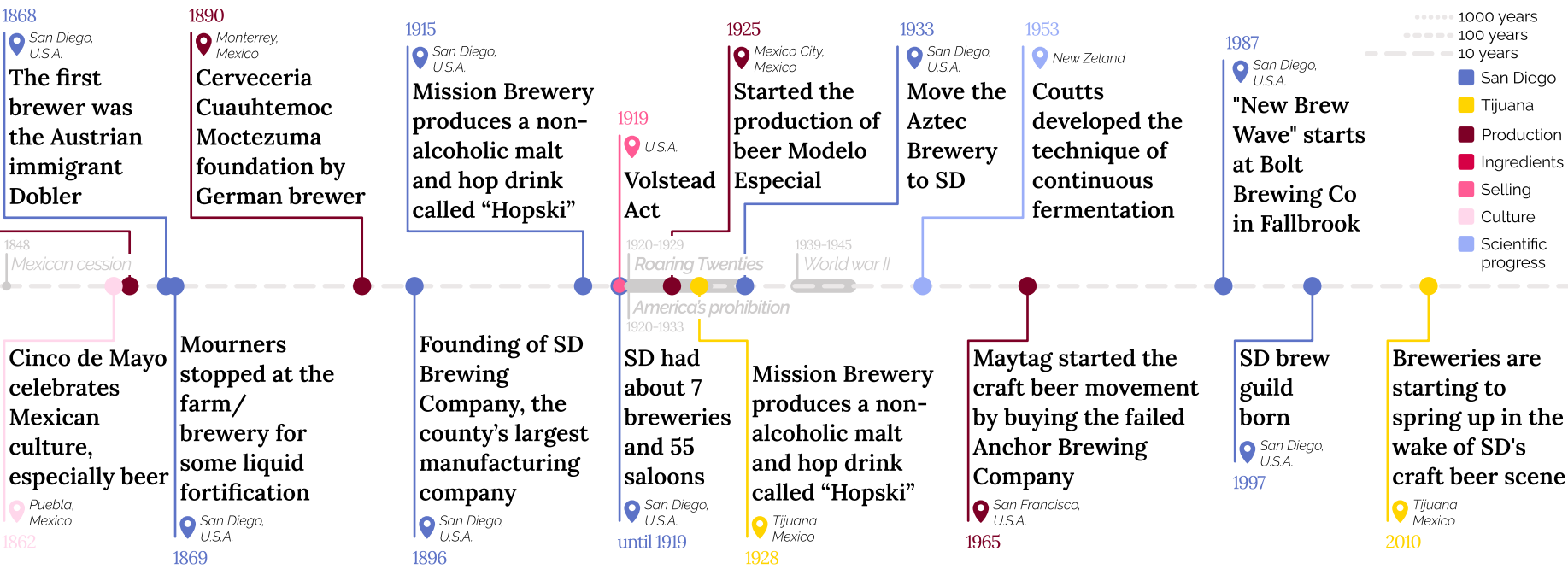


Glasses design
A glass per beer



Food pairings

Food dishes	Grain	Beans & legumes	Shellfish	Meats & vegetables	Poultry	Fats	Grilled vegetables	Chocolate
Beers	Amber Lager Style Pilsner	Brown Ale Hefeweizen	Style Saison Hefeweizen	Flanders	Pale Ale Brown Ale	Black Ale Brown Porter	Dry Stout	Bock Porter



5.5

production process

raw materials

Beer is distinguished by its **distinctive flavor**, derived from four fundamental ingredients: **malt, hops, yeast, and water**. By **varying the proportions** and **infusion times** of these ingredients during the brewing process, a **wide array of beer styles** can be produced. Furthermore, unique flavors can be achieved through the **addition of adjuncts** such as honey, coffee, and spices.

Malt plays a crucial role in determining the **flavor profile** of beer, primarily serving as the **source of fermentable sugars** during fermentation. Typically, malt is derived from the **malting of barley**, although **other cereals** such as wheat, oats, corn, and rice, as well as bran, glucose, sugar, and molasses, can be used as substitutes. For specific beer styles, such as Blanche, Lambic, and Wheatwine, wheat is **combined with** barley malt to produce a **lighter beverage**. In other instances, such as the Belgian Saison, the base malt is **locally sourced**, reflecting traditional agricultural practices where **surplus harvest was malted** and utilized in beer production.⁸⁵

Barley, a member of the **Poaceae family**, is available in two primary forms: **two-row** (distichous) and **six-row**. In two-row barley, only the **central florets** are **fertile**, while six-row barley features smaller, **variably sized seeds**, making it **less suitable for malting**. Consequently, two-row barley is **preferred in Europe** and other regions for beer production due to its higher malting quality. Conversely, six-row barley, with its higher protein content, is often **avored in North America** for brewing purposes.⁸⁶

In the United States, **barley cultivation and malting** are predominantly concentrated in the **north-central states**, with smaller operations in regions such as California. Historically, **California** had extensive **barley and hop cultivation prior to Prohibition**, which has seen a resurgence with the advent of craft breweries.⁸⁷

On a global scale, **European countries** are the **leading exporters of malt**, with France (11.3%), Belgium (10.3%), and Germany (9.1%) at the forefront. This dominance is closely associated with the rich brewing traditions and the diverse

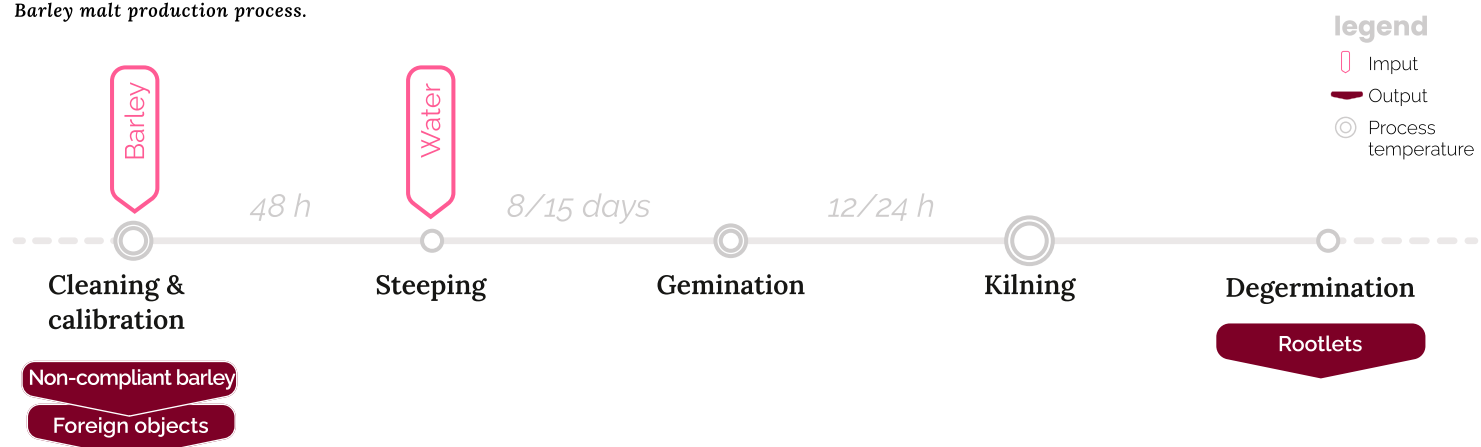
array of beer styles originating from these nations. In the Americas, Argentina (8.4%), Uruguay (6.2%), Canada (7.3%), and the United States (4.1%) are the principal malt exporters.⁸⁸

The **malting process**, which converts barley into malt, involves several key stages. After **harvesting**, barley is **cleaned, calibrated**, and non-conforming grains and foreign matter are removed. The grains are then **steeped in water**, consuming between **4 and 8 m³/ton of water** over approximately **48 hours**, to achieve a **moisture content of 43-48%**. Following steeping, the grains undergo **germination** at a **constant temperature of 16°C** for **8 to 15 days** in specialized containers with **continuous agitation** to **ensure proper oxygenation**, temperature maintenance, and **carbon dioxide expulsion**. During germination, the barley **accumulates the sugars and proteins** essential for beer fermentation. When the **acrospire** reaches three-quarters of the grain length, germination is halted by **kilning**. The grains are **dried at temperatures** ranging from **80 to 200°C** for **12 to 24 hours** in kilns with **perforated floors** that facilitate hot air circulation to remove moisture. The malting process concludes with **degermination**, performed through **abrasion or sieving**.^{89 90}

Hops are the second **fundamental ingredient** in beer production, imparting the characteristic **aromas and bitter flavor** to the beverage. There are **various hop varieties**, each contributing to the **diversification of beer styles**. These varieties are distinguished by the **amount of alpha acids** they contain **organic compounds** responsible for the **hop's bitter taste** and its important role as a **natural antibacterial agent**.⁹¹

Beyond the significance of alpha acid content in selecting the most suitable hops for a particular beer style, the **quantity of hops** used during the brewing process is also crucial. For instance, beers like Imperial IPA (1.7 kg/keg), Imperial Stout (0.8 kg/keg), and Barleywine (0.7 kg/keg) contain higher amounts of hops, resulting in a more pronounced bitterness. In contrast, beers such as Stout (0.1 kg/keg), Amber (0.1 kg/keg), and Lager (0.1 kg/keg) use less hops and thus

Barley malt production process.



keg) use less hops and thus have a milder bitterness on the palate.⁹¹

The hop plant, scientifically known as **Humulus lupulus**, belongs to the **Cannabaceae family**. The part used in brewing is the **hop flowers**, or **cones**, which contain **lupulin glands** rich in **resins and essential oils**. Notably, hops are **dioecious**, meaning only the female plants produce the cones necessary for beer production.

Naturally, hops grow in cool climates, but they are **adaptable to various environments**, making them **suitable for cultivation**. As a perennial climbing plant, hops are **grown on trellises** with wooden poles and wires to support their growth, allowing them to reach heights of up to 5 meters.⁹²

Today, whole hop cones are no longer used in brewing; instead, **they are pelletized** to create a more **uniform raw material**. In some cases, **essential oils extracted** from hops are used directly to better control the bitterness imparted to the beer.

The **hop pelletization process** begins with the **harvesting** of cones, which takes **place between August and October**, depending on the flowering period of different hop varieties. The cones are then **cleaned** of any foreign objects, leaves, and branches before being dried. During **drying**, the cones are spread out on tables in **drying rooms** where **air is circulated to reduce** their internal **moisture content** from 80% to **8-12%**. The dried cones are then **pressed into bales** to ensure uniform drying before being **pelletized**.⁹³

In the **United States**, **hop cultivation** is primarily concentrated in the **northeastern** part of the country. Notably, the state of Washington accounts for the largest share (69.1%), followed by Oregon (12.6%) and Idaho (14.3%).⁹⁴

In **California**, hop cultivation began to flourish in the **latter half of the 19th century**, driven by an **increased demand** for beer in the state. This trend saw significant growth towards the end of

the century. According to the **1910 census**, California ranked as the **third-largest hop-producing state**, following New York and Wisconsin. However, with the **onset of Prohibition** in 1920, most **hop fields were repurposed** for other uses. It was only after the repeal of Prohibition in **1933** that **hop cultivation resumed**, with **small-scale farms** focusing on specific varieties to cater to the niche market of craft breweries.⁹⁵

Regarding **yeast**, a **unicellular microorganism** belonging to the **fungi kingdom**, it is the crucial ingredient that **enables fermentation**, transforming wort into beer.

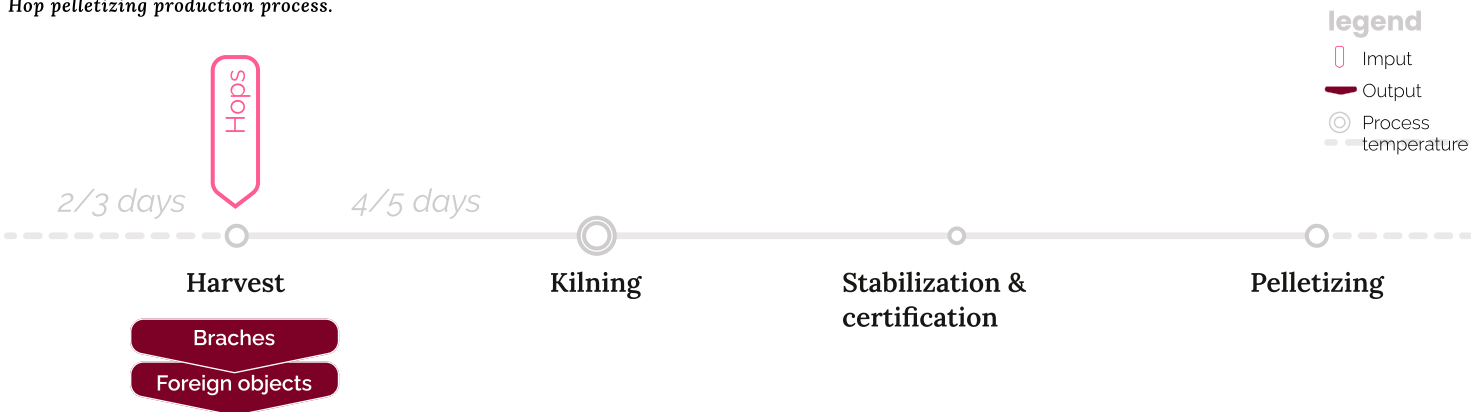
The vital role of yeast in the brewing process, particularly during wort fermentation, was demonstrated only in the **latter half of the 19th century** by microbiologist and chemist **Louis Pasteur**. The **first production** of beer fermented with **cultured yeast** occurred in **1883** at the **Carlsberg Brewery**, thanks to the research of chemist Emil Christian Hansen.⁹⁶

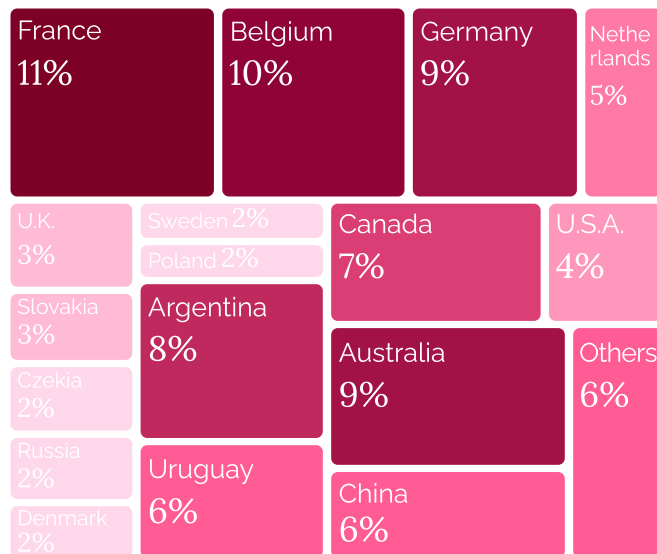
Historically, beer and other alcoholic beverages were produced through **spontaneous fermentation** using various yeast strains, resulting in a wider **diversity of beer flavors**.⁹⁶ However, with scientific advancements, yeast categorization, and controlled fermentation processes, the primary yeast families used in brewing became **Saccharomyces cerevisiae**, commonly known as brewer's yeast, and **Saccharomyces pastorianus**.

Saccharomyces cerevisiae is generally **used** for brewing **Ale-style beers**,⁹⁷ with fermentation occurring at **temperatures between 6 and 23°C**. Conversely, *Saccharomyces pastorianus*, a **natural hybrid yeast**, is used for brewing **Lager-style beers**, with fermentation taking place at **lower temperatures, between 7 and 12°C**.⁹⁸

In the **San Diego-Tijuana region**, breweries primarily source their yeast locally from the **White Labs** yeast production company.

Hop pelletizing production process.

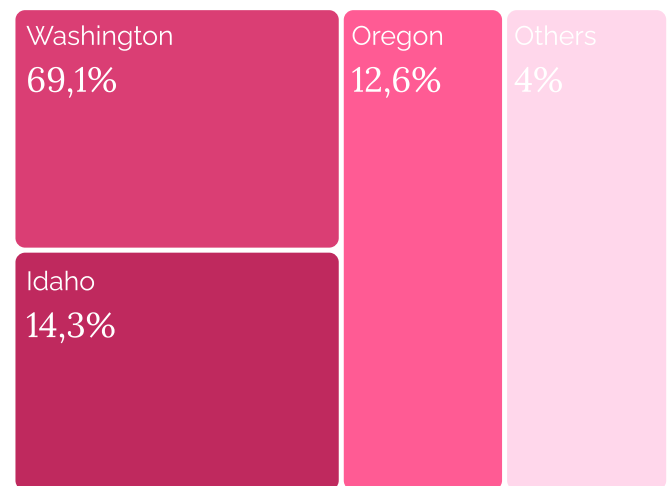




Major malt exporting states.

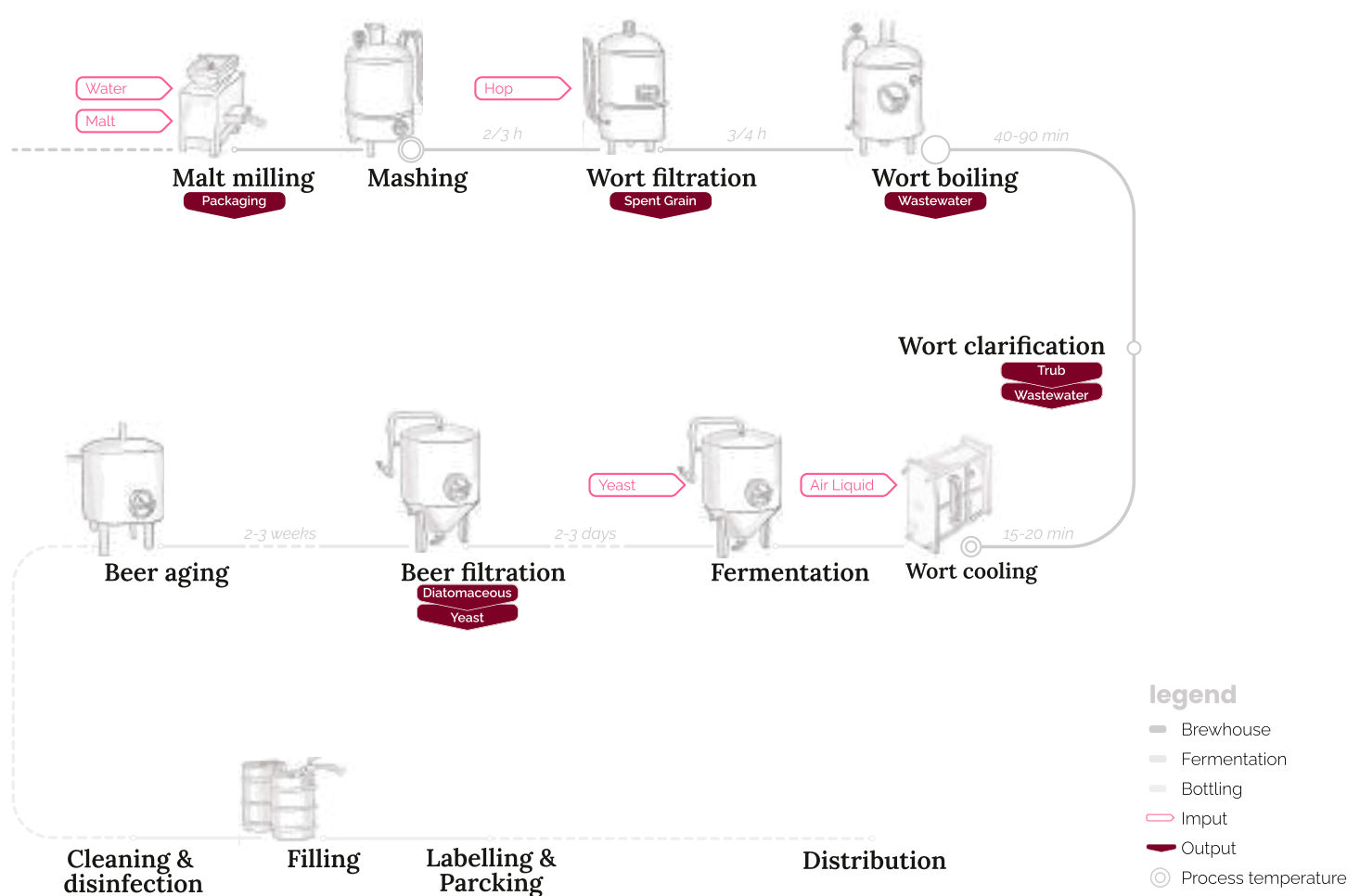


Amount of hops per beer style



Origin of the hops.

Production process.



brew beer

The beer production process has been refined over time, with each step now precisely defined. The transition from rudimentary methods to large-scale production has led to a **scalable and adaptable** process **suitable for home brewing**, small to medium-scale artisanal production, or industrial manufacturing.

The production process described here follows **small-scale artisanal brewing**, based on field research conducted in Tijuana at the **Farland Brewery**, discussed in detail in Chapter 5.7.

The beer production process can be logically divided into **different "rooms"** where various processes occur, reflecting the **spatial division** typically seen in breweries. These rooms are: **the brewhouse**, the **fermentation room**, and then **distribution**.

In the brewhouse, **wort preparation processes** take place. Initially, the raw materials are prepared: **water is filtered and purified** through reverse osmosis, and the **malt**, purchased in bags, **is milled** to facilitate water absorption and sugar exposure during fermentation.⁹⁹

The milled malt and cold water are transferred to the mash tun to initiate the **mashing process**, where heat helps the **malt release its properties**. After approximately **2-3 hours**, the **wort is filtered**, and the **spent grain** is collected in containers. Currently, this spent grain is sold to farms and incorporated into **animal feed**.

The wort is then transferred to the **kettle tun**, where **hop pellets** are added, and the **mixture is boiled** for a period that varies between **40 and 90 minutes**, depending on the beer style being produced. Boiling the wort is the **most energy-intensive process**, as it involves maintaining high temperatures for an extended time. However, this step is crucial as it **sterilizes the wort**, allows the extraction of **hop compounds** such as essential oils and alpha acids, and influences the beer's **color and flavor**.⁹⁹

The wort, now rich in flavor, is **clarified** in the **whirlpool**, where the **solid parts**, consisting of hop and grain residues that form the **trub**, are **separated** from the clear wort.

Before moving to the fermentation room, the **wort is cooled** from its boiling temperature of approximately 96-99°C to below **25°C**.⁹⁹ The cooled wort is then transported through pipes into the **fermenter**, where **yeast**, previously inspected, and **hop pellets** (if the **dry hopping technique** is used) are **added**. Dry hopping involves adding **additional hop pellets** during **fermentation** to enhance the hop aroma.

Fermentation, which lasts between 2 to 3 days, is essential as the yeast transforms the wort into beer by metabolizing the starches in the malt,

After fermentation, the beer is **filtered** through the fermenter's conical bottom to **remove yeast residues** and any remaining hop particles. Before **bottling in kegs and cans**, the beer is **tested and quality-checked** in a laboratory to ensure the flavor and alcohol content are correct.

Once each tun is used, it is systematically **cleaned** with **water and chemicals**, generating **wastewater**.

The beer production process concludes in the fermentation room. The **filled cans and kegs** are stored in a **refrigerated storage area** before being sold directly in the adjacent **brewpub** or through **distribution channels** such as the brewery's website and physical store within the brewpub.

output

The outputs from the brewing process are **primarily organic**, including spent grain, hot trub, yeast residues, spent hops (in the case of dry hopping), and, unfortunately, spoiled beer if it fails to meet technical standards.⁹⁹

In addition to the primary waste,¹⁰⁰ there are **wastewater** from tun cleaning and **inorganic waste** from raw material packaging.

The most abundant waste, constituting **85% of all brewing production waste**, is **spent grain**, which is filtered out of the wort. Due to its **various nutritional properties**, this biomass can be repurposed. Currently, Farland Brewery sells the spent grain to a **local farm** where it is used as **animal feed**. Additionally, inspired by this practice, Farland Brewery has experimented with repurposing this waste to **produce dog food** in small quantities.

Hot trub, which results from the wort clarification stage, is an insoluble precipitate with a **moisture content** between **80% and 90%** and a **dry matter content** between **15% and 20%**.¹⁰⁰ Owing to its **nutrient-rich composition**, trub is a valuable source of nutrients. To recycle this waste, Farland Brewery currently combines hot trub with spent grain.

Finally, the significant organic waste is **yeast**, which settles at the bottom of the fermenter during fermentation and is expelled from the fermenter's conical bottom. This mixture of yeast and beer **reduces the overall volume** of produced beer slightly. However, the yeast-beer mixture can be reused up to six times¹⁰⁰ for the fermentation process.

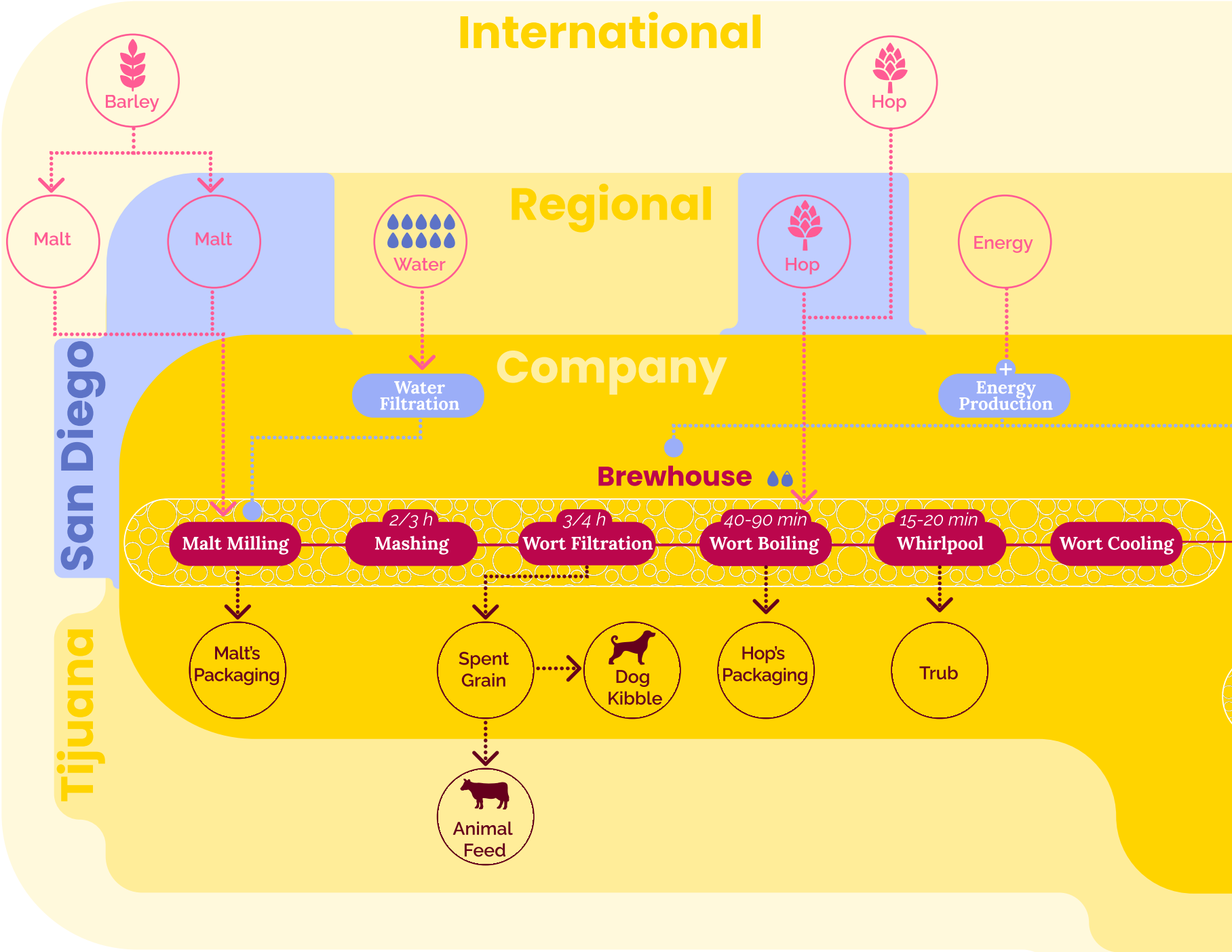
Once the yeast has reached the end of its useful life, it can be combined with the wastewater from cleaning the equipment and the spoiled beer.



Production process

a beer for change

Arriving at Farland is like **stepping through a portal** into a whole new dimension. Along Avenida 20 de Noviembre in Tijuana, amidst rich, vibrant neighborhoods and tight-knit working-class communities, lies a brewery that **defies convention**. It is **more than just a place to drink beer**, it is a sought-after refuge for its residents, guided by “El Viajero” to the place where their **favorite beer flows freely**. At Farland, each sip is an encounter a tale to be shared. Here, beer is much more than a drink: it is the **conduit for making connections**, transcending mere refreshment to become a means of **community experience**.

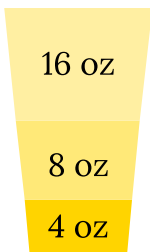


Relationships



Dare to drink. Beer Styles

Sizes



Captain Cassian
Czech Pilsner

Journey Through Helles
Munich Helles Lager

Bapa di Bopi
Italian Pilsner

King Wizard
New Zealand Lager

Amber is the Color
Amber Lager

Kessel Run
American Pale Ale

The Traveler's IPA
American IPA

Spectral Siren
IPA

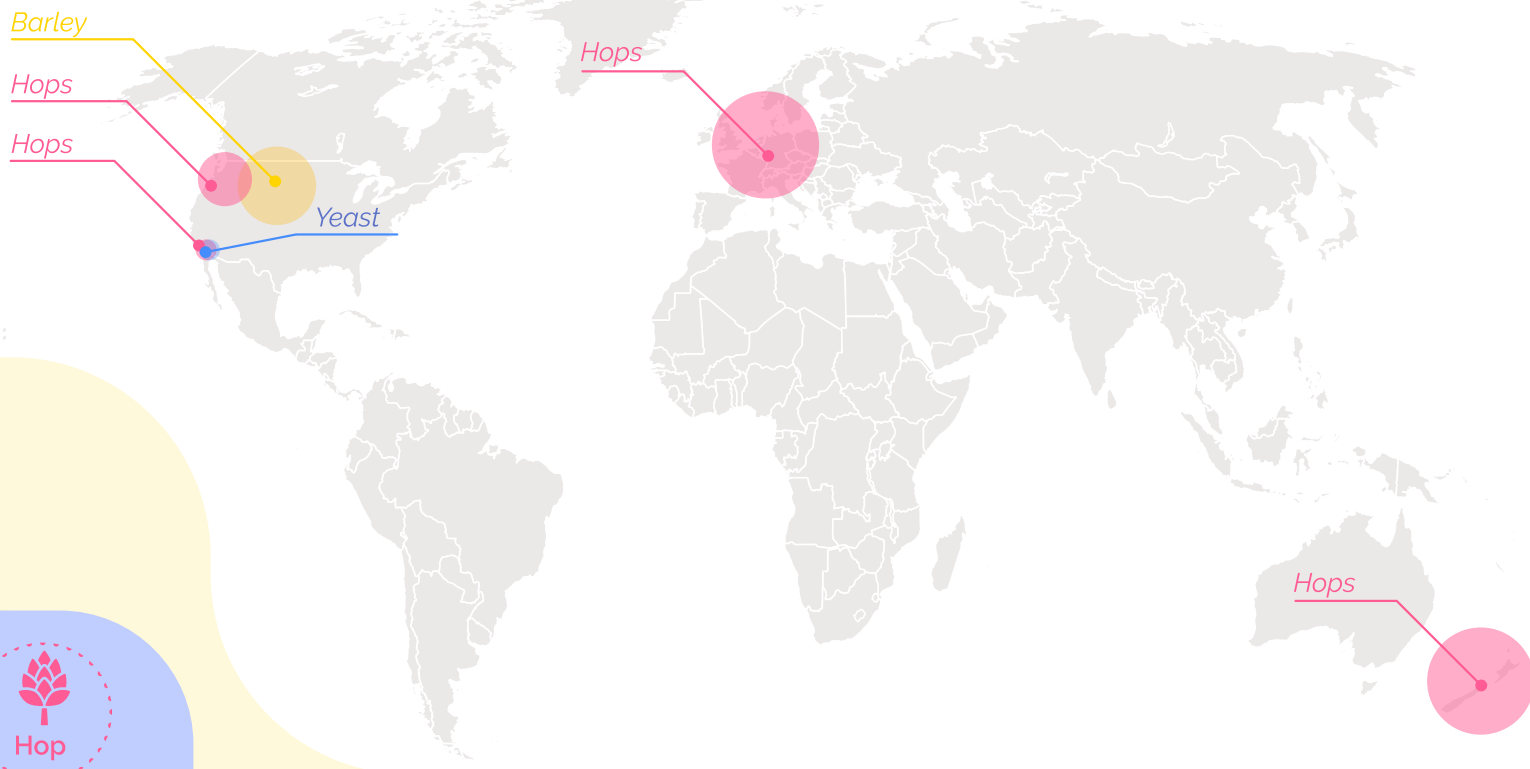
Lil' Penguin
Cold Session

Third Sister
American Stout

Third Sister Nitro
American Stout



Raw material's origin



Legend

- Input
- Varying input according to the technique used
- Output
- Varying output according to the technique used
- Pre-process
- Process
- Company's Areas
- Quantity of water

Fermentation Tanks

2/3 days
Fermentation

Beer Filtration

Checking

Filling

Distribution

Storage

Selling

Consumption

Selling

Consumption

Beer Packaging



5.6

from output to input



Upcycling of brewery's packaging. (April 6, 2024).
made by the authors

Building upon the preceding discussions, waste generated throughout the beer production process emerges as a significant aspect of operations. In **2021** alone, the production yielded a substantial **4,352,000 tons of solid by-products**, originating from various procedural stages.¹⁰¹ Consequently, endeavors have been directed towards comprehending the **intrinsic value and potential utility** of these by-products within the craft beer production continuum, as well as their applicability to other industrial sectors.

It is estimated that *"approximately **85% of by-products generated** in this process can be effectively repurposed into valuable resources, thereby significantly reducing production expenditures and concurrently bolstering self-reliance."*¹⁰⁰ Presently, a range of avenues exists for the **retrieval and repurposing** of beer production **by-products and residues**, several of which will be elucidated within this dissertation.

Numerous enterprises, particularly those championing environmental sustainability, are embracing a **"wasteless"** ethos in beer manufacturing. This paradigm shift encompasses multifaceted strategies, including **"enhancing material resilience, discerningly selecting raw materials and optimizing their utilization, and fostering a culture of material recycling. In scenarios where waste generation proves inevitable, steadfast endeavors should be undertaken to facilitate its recycling."**¹⁰²

Table of functional compounds in spent grain.

functional compounds in spent grain	role in uman body
Non-cellulosic polysaccharides (<i>β-glucan and arabinoxylans</i>)	Reduce the rise in blood glucose after meals Reduce blood glucose levels.
Proteins	Increase satiety Regulate long-term energy balance
Polyphenols	Anti-carcinogenic Anti-inflammatory and antioxidant activities
Fiber	Reduces cholesterol levels Increases fecal bulk
Vitamins	Antioxidant properties

Spent Grains

The first and **most abundant** by-product of beer production is the spent grains, which are removed from the wort after a **filtration process**.⁹⁹ Their quantity amounts to **14 kg per hectoliter** of wort and they contain **80% water**.⁹⁹

Currently, spent grains are sold as **animal feed**, either in wet or dry form, due to their **high nutritional content**.¹⁰⁰ However, this option poses several challenges due to the high moisture content of the by-product, which could lead to mold formation if not **adequately stored or dried**.¹⁰⁰

Given their nutritional properties, spent grains have significant **potential for human consumption**,¹⁰³ primarily due to their fiber, protein, monosaccharide, mineral, and vitamin content.¹⁰³ Although not currently used for large-scale food production, spent grains, also known as Brewers' Spent Grain (BSG), can be utilized as low-cost components for **human food products**.¹⁰⁰ According to current research, BSG has multiple health **benefits for humans**, aiding against constipation, obesity, diabetes, and cardiovascular diseases.¹⁰³ Therefore, their reuse in the food chain is desirable to fully leverage their **beneficial properties**.

There is, therefore, a great deal of research showing how these by-products, generated from brewing waste, can be used for **human nutrition**. These fall, in fact, into several categories:

- **Bakery products**, such as bread, pasta, and snacks;
- **Dairy products**, like yogurt and cheese;
- **Meat-based foods**, such as sausages and meatballs;
- **Sweets and protein-rich energy bars**;
- **Juices and smoothies**.^{100 103}

Some products, like pasta and bread, require spent grains to **be processed into flour** before being **mixed with other ingredients**. This step is **essential** to make the by-product **effectively usable** in other contexts. However, especially in bakery products, **the amount** of spent grains that **can be integrated** into the production process is **limited** to avoid excessive flavor alteration.¹⁰³

Additionally, spent grains are highly appealing for their **antioxidant properties**, making them attractive to **cosmetic companies**.¹⁰⁴

Finally, the last avenue for reusing spent grains lies in the possibility of **generating renewable energy**, which is also interesting as it would allow companies to **reduce** their **carbon footprint**.¹⁰³

functional foods derived from spent grain	quantity of SG added	properties
Bread	10–15% spent grain flour	<div>Acceptable sensorial properties;</div> <div>High fiber content (health benefit);</div> <div>Increased mineral content;</div> <div>Influences the rheological and pasting properties of dough;</div> <div>The biaxial extensional viscosity is significantly higher;</div> <div>The strain-hardening index decreases with increasing quantities of flour substitution;</div> <div>Reduces the uniaxial extensibility, while the storage modulus, G', increases;</div> <div>Addition of spent grain increases the composition/nutritional properties;</div> <div>The color of bread turned from light cream to brown;</div> <div>Water absorption increases with the quantity of spent grain;</div> <div>Increased crumb firmness;</div> <div>Increased antioxidant content.</div>
Bread obtained from fermented spent grain	25% - 100% spent grain sourdough	<div>Changes the porosity and acidity;</div> <div>Bacteriostatic function (the shelf life of bread increases).</div>
Spent grain pasta	5–25% spent grain flour	<div>Increased protein, fiber and -glucan content;</div> <div>Increased antioxidant content;</div> <div>The higher the spent grain content, the darker the color of the pasta;</div> <div>A compact structure with higher firmness;</div> <div>Decreased cooking loss;</div> <div>Decreased degree of starch gelatinization;</div> <div>Reduced the optimal cooking time;</div> <div>Increased total organic matter.</div>
Cookies	Max 30% spent grain added	<div>Fiber and protein content increases;</div> <div>Dough development time and dough stability increases;</div> <div>Total antioxidant activity increases;</div> <div>Water absorption increases.</div>

functional foods derived from spent grain	quantity of SG added	properties
Shortbread	30%	Increase in fiber and protein content; Decrease in carbohydrate levels and energy value.
Muffins	15–30%	Increases the amount of fat, protein and total dietary fiber; Increases the viscosity of the batter.
Wafers	5–20%	Gumminess, chewiness, springiness, firmness and cohesiveness increase.
Snacks	10–30%	Increase the total content of polyphenols, flavonoids, proteins, fats, dietary fiber and energy; Increases phytic acid and resistant starch content.
Yogurt and plant-based yogurt alternatives	5–20%	Yogurt's syneresis level was considerably reduced; Decreased fermentation time and increased viscosity and shear stress; Maintained textural and gelling formation.
Frankfurters sausages	1–5%	Total dietary fiber increases.
Tarhana	6%	Increase in protein and fiber content.
Fruit juice and smoothies	0–10%	Increased antioxidant activity

Hot Trub | The second of the solid waste by-products is the hot trub, representing **0.2–0.4% of the wort volume**.¹⁰⁰ This by-product is the solid component that **settles** at the bottom **during centrifugation** in the beer production process. The hot trub is **rich in nutritional properties**, composed of coagulated colloidal proteins, complex carbohydrates, lipids, minerals, tannins, hop residues, and small malt particles.¹⁰⁰ However, its direct use as **animal feed** presents more challenges **compared to spent grain**, primarily due to its **bitter taste** derived from the contained hops.

Despite its bitter taste, studies have shown that trub, **combined with dried yeast**, can be used in **dried protein feed preparations**, making it acceptable as **swine feed**.¹⁰⁰

Another potential use involves extracting the nutrients within. Through transformative processes, it is possible to utilize this material to produce **natural fertilizer** or **cosmetic products**.^{100 101}

Yeast | The last by-product is yeast, representing **"15% of total by-products generated"**.¹⁰⁰ Despite the considerable amount of waste, this by-product is almost always relegated to **animal feed**, although it could be applied to other types of uses. Similar to trub, refining processes are crucial to ensure safe use in the animal feed chain for animals such as rats, pigs, and salmon.¹⁰⁰

Some frontiers of research explore the possibility of **extracting antioxidants, nucleic acids, proteins, sugars, and vitamin D**, which yeast is rich in, to produce **functional foods** for the human diet.¹⁰¹



5.7

taste closely

The desk research was supplemented by a series of site visits, which facilitated the **exploration and analysis of the identified phenomena**, as well as their observation and discussion with individuals active in the craft beer industry. The field research was conducted in the **Piedmont region of Italy** and in the analyzed areas of **San Diego and Tijuana in America**.

A **preliminary field research** was initiated in Italy, specifically in Piedmont, through site visits to the Edit and Baladin breweries. These visits enabled a comprehensive understanding of the **current state of the brewing sector in Piedmont**, offering deeper insights into the production process of craft beer on a small and medium scale compared to the desk research.

As discussed previously in section 5.3, the craft beer industry in Italy does not have ancient roots but rather a very **recent history**, especially compared to other European countries. Particularly, Piedmont, with its UNESCO hills of Langhe, Roero, and Monferrato,¹⁰⁵ is a region where the wine sector predominates over other alcoholic beverages.

During the “omelia domenicale”¹⁰⁶ (trans. “Sunday Homily”), as named by Teo Musso, it was possible to learn about the **history and evolution of the Baladin craft brewery** within the Italian context.

The pub Le Baladin was established in **1986** in the main square of **Piozzo**, in the province of Cuneo, from the vision of the young **Teo Musso**, who decided to open a brewery in a region traditionally accustomed to consuming and producing wine. His mother's reaction to his project was, “ah gli ho detto che era matto, qua la birra non si beve”¹⁰⁶ (trans. “I told him he was crazy, beer is not drunk here”). The name Le Baladin, suggested by François Raulin, creator of Le Cirque Bidon, which had a positive impact on Musso's life, derives from French and means “il cantastorie” (trans. “the storyteller”). The **circus theme**, dear to the owner, is **reflected in the pub's interiors**, including a permanent circus tent setup in the courtyard, the **Baladin fonts**, and the **labels of the beers** developed in 1997.

From the beginning, the venue became a **reference point** for young people in the province of Cuneo. Thanks to the selection of Belgian beers and those from Northern Europe, the pub offered around 260 different types.

After experiencing a failure with a roller disco in Strasbourg and inspired by a brewpub concept described by an acquaintance in a bar in the same city, Teo Musso decided to brew his own beer. Following a period spent in Belgium at Brasserie d'Achouffe and Brasserie à Vapeur, Musso returned to Piozzo to start brewing. With limited financial resources, he utilized his welding skills, learned in his youth, to construct the necessary equipment. In **1996**, Le Baladin **became a brewpub**, selling its own beers on-site, initially resulting in the loss of many customers. Drawing inspiration from local traditions, Musso began **producing aromatic beers**, which, like wine, were to be smelled before tasting to appreciate their aroma. The first beers produced were Isaac and Super. For the latter, he expanded his business by selecting 500 restaurants in Italy to sell the beer, designed to complement the served dishes. Notably, this beer was bottled in 75 cl bottles, similar to wine bottles.

Due to the success of the beers, the original Le Baladin premises became too small to accommodate the brewpub. In 2002, Musso constructed the “birrodotta”, a pipeline transporting beer from the brewing room to the new fermentation room, traversing part of Piozzo.

Later, to address distribution needs, Musso established his own distribution company and, to **stimulate the craft beer sector in Italy**, created a competing brand in collaboration with the beverage producer Lurisia. In 2005, Musso won the “Semper Ardens Award for Beer Culture”, instituted by Carlsberg, for his contribution to the emergence of beer culture in Italy. The following year, in collaboration with Lorenzo Dabove, known as Kuaska, he developed the **TeKu glass**, discussed in section 5.4, which is sold and used worldwide.

Aiming to highlight the Italian brewing sector, Musso sought to raise awareness among Italians that beer is also an agricultural product. He thus **created a supply chain of locally sourced raw materials**. The malt comes from Menfi, home to Italy's largest malting facility, and the water

from three different Piedmontese sources. However, he faced a shortage of hop cultivation. To address this issue, he began growing hops, and in 2011, the beer Nazionale was produced using these Italian raw materials.

Since 2008, several pubs have been opened both in Italy and abroad, in cities such as Rome, Turin, London, Zanzibar, and Essaouira, with a potential future opening in Cuba, where Musso intends to produce beer using local ingredients to overcome import challenges. Returning to Le Baladin's roots, in 2014, the renovation of the farmhouse that currently houses the entire beer production and the Baladin Open Garden pub began.

Following the "omelia domenicale" (trans. "Sunday Homily"), it was possible to visit the production facility located just outside the town of Piozzo. This facility has a production **capacity of approximately 50.000 hectoliters per year**, making it significantly larger than other observed breweries.

The beers produced are of the Ale style, meaning they are top-fermented. The beer production process follows the method outlined later in section 5.5. Additionally, during the visit, we had the opportunity to taste Xyauyù, a Barley Wine that resembled a liqueur more than a beer due to its unique firmness, sweetness, and long aging characteristics.

After the site visit, we interviewed the owner, Teo Musso, who clarified several aspects of the enterprise he created.

First and foremost, Musso emphasized the **company's goal of achieving circularity in the production process**, stating, "[...] chiudiamo tutto il cerchio, quindi tutto quello che è materia prima viene riutilizzato totalmente [...] l'obiettivo nostro è di diventare un esempio sotto questo aspetto"¹⁰⁶ (trans. "[...] we close the loop entirely, so all raw materials are fully reused [...] our goal is to become an example in this regard").

Regarding raw materials, Baladin is committed to an **Italian short supply chain**. Musso hopes that "[...] i birrifici italiani prendano coscienza del percorso sano di sostenere la filiera, questo è il primo passaggio difficile da far fare. [I nuovi birrifici artigianali] Hanno paura di utilizzare prodotti che non siano americani o tedeschi che è una coglionata assurda."¹⁰⁶ (trans. "[...] Italian breweries will become aware of the healthy path of supporting the supply chain; this is the first difficult step to take. [New craft breweries] are afraid to use products that are not American or German, which is utterly nonsensical.").

As for the outputs from the beer production process, all are repurposed:

- **Spent grains** are reused for **animal feed**.
- **Yeasts** separated from the beer are used in **biogas production**.
- **Digestion sludge**, consisting of bacteria used to eliminate possible yeast residues, is integrated into **local farming**.

Baladin pursues various projects to innovate and develop the craft beer sector in Italy, some of which are in **collaboration with universities**.

One completed project, for which they are in the process of patenting, involves deriving an extract from spent grains to be reused in bread making.

Another project, funded by the PNRR and in collaboration with the **Sant'Anna School of Advanced Studies in Pisa**, aims to create a machine capable of recovering and purifying fermentation CO₂ for use in soft drinks and packaging fills. This project also involves developing a tool that other breweries can use to estimate their CO₂ impact on the environment. This tool is crucial for sustainability, especially for small breweries, as Musso noted, "[...] oggi l'approccio è un po' "sono piccolo e inquinano poco, ma non è mai così". La progettualità [del tool] è anche di

dare un modo corretto ai piccoli produttori, di dare una mano o almeno di presa di coscienza." ¹⁰⁶ (trans. "[...] today the approach is a bit 'I'm small, so I pollute little,' but that's never the case. The tool's purpose is also to provide small producers with a proper way to help or at least raise awareness.").

*This ties into another future project for which Musso is raising funds through crowdfunding. One of the ambitions of this **project is to create an Open Hub**, a shared brewery acting as an incubator for small craft breweries, aiming to* ¹⁰⁶ *"[...] di ricucire un rapporto oggi difficoltoso tra il mondo dei distributori di birra e il mondo della birra artigianale" (trans. "[...] mend the currently difficult relationship between beer distributors and the craft beer world.").* *This project, planned for an ex-Heineken facility in Lombardy, envisions Baladin's technical team supporting the growth of five small craft breweries to position their brands on the national market, helping them overcome challenges in growing their businesses by sharing their expertise.*

***Edit Brewing** represents a **more recent venture**, led by a young team. Founded in **2017** in **Turin**, within a former INCET facility that once produced electrical cables, its mission is to enhance and revitalize a post-industrial area of **Barriera di Milano**, which is now filled with abandoned and decaying factories and warehouses.*

*Upon entering the premises, the brewing room is immediately visible behind the counter where beers are served, while the fermentation room is separated and located in an adjacent space. The beer production process at Edit is similar to that described in section 5.5, with the notable difference that the beers are unfiltered. Edit's beers are designed to be **easily drinkable and enjoyable for a broad audience**.*

*Regarding raw materials, the **hops** are primarily sourced **from the Yakima Valley** in the northwestern United States and Illinois, with the exception of their *Blanche*, which is brewed with **Italian hops** from the province of Cuneo. The main byproduct of production, **spent grains**, is repurposed for **biogas production**.*

*Edit Brewing **actively collaborates both within the Piedmont region and across Italy**, working with various craft breweries on collaborative brews. Notably, Edit is one of the craft breweries that support the Biova Project, another Turin-based initiative. The **Biova Project uniquely produces beer from surplus bread** collected from bakeries and does not have its own production facility, instead relying on local craft breweries to provide the necessary equipment.*

A second site visit was conducted in the research region of the thesis, starting from the city of San Diego. Here, it was possible to directly appreciate the findings from the desk research, as the **culture of the American craft beer sector** differs significantly from the European, and particularly the Italian, one.

In San Diego, several brewpubs and tasting rooms were visited to understand the demographics and behaviors of their patrons. The visit included the production facility of the microbrewery Pure Project and conversations with various individuals involved in the craft beer sector from both academic and industry perspectives.

Among the brewpubs and tasting rooms visited, a few stood out due to their unique characteristics.

One notable example is the **Bottlecraft tasting room** in Little Italy, which **offers beers from both the city and beyond**. Conversations with the bartender, an enthusiast of the sector, provided valuable insights from his perspective.

Another distinctive **tasting room is The Lost Abbey**, located in a **deconsecrated Mexican Presbyterian church** in the East Village neighborhood. The unique location influences the entire concept of the tasting room, from its name to its original interior design. Additionally, many breweries in San Diego, following a common trend in the rest of the world as well, tend to repurpose abandoned urban spaces. For example, **Mission Brewery is housed in the Wonder Bread building**, a former bread factory constructed in 1894.

A detailed visit was conducted at the **Pure Project microbrewery** (as they define themselves), an interesting entity **committed to environmental sustainability**. Founded in **2013** by friends **Jesse Pine and Mat Robar**, they initially faced challenges in Costa Rica related to infrastructure and climate, leading them to relocate to San Diego. In 2016, they opened their production facility in Miramar, an area with several craft beer production sites.

In a context where it is not so common to take **environmentally friendly actions**, Pure Project, tries in its own small way by trying to reduce the use of plastic, using raw materials that are local and that respect the company's values, whereby, as stated by Mat Robar "So the first is sourcing. We try to source from quality places, like places that are using organic ingredients, places that are practicing regenerative farming, if possible", ¹⁰⁷ reducing production waste to a minimum. Robar also highlighted the **financial challenges of sustainability in the craft brewery sector**, describing it as "a double-edged sword" due to the limited financial resources of microbreweries.

Beyond visits to breweries, brewpubs, and tasting rooms, it was possible to meet individuals working in San Diego's craft beer sector.

From an academic perspective, attending a lecture by **Neil Reid**, hosted by **Professor Julie Wartell** at the University of California San Diego, was particularly insightful. Julie Wartell, a beer enthusiast and Associate Professor of the Craft Breweries and Urban Economy course, co-authored the book **Craft Breweries and Cities: Perspectives from the Field with Vince Vasquez**. Neil Reid, a Geography Professor at the University of Toledo and author of the blog TheBeerProfessor, discussed his chapter from Wartell's book during the **lecture on "Craft Breweries as Neighborhood Assets"**.

During the lecture, which focused on the topic Craft Breweries as Neighborhood Assets, the professor Neil Reid explained that craft breweries serve as **significant neighborhood assets by occupying pre-existing buildings with historical or cultural value**. This adaptive reuse preserves architectural heritage and fosters community identity, preventing decay and demolition of these structures. By repurposing

such spaces, breweries contribute to the conservation of local history and the unique character of neighborhoods.

Breweries also act as **economic catalysts by attracting customers to peripheral areas** with affordable, spacious buildings. Entrepreneurs are drawn to these neighborhoods due to cost-effective real estate options suitable for brewing infrastructure, stimulating local economies and encouraging further investments.

Additionally, craft breweries **play a pivotal role in community building by hosting innovative activities** like themed nights and craft workshops, drawing diverse groups together. These events promote social interaction and foster a sense of community. Many breweries offer family-friendly environments, welcoming individuals under 21, which promotes responsible alcohol consumption and inclusivity.

Breweries often feature communal tables, board games, and live music, encouraging patron engagement and strengthening community ties. By **creating social hubs**, breweries enhance the social cohesion and vitality of their neighborhoods, underscoring their role in preserving cultural heritage while building strong, integrated communities.

Additionally, **Gregory Mallinger**, Assistant Director for Partnership Initiatives, provided further academic insights. His thesis, **The Boom of the Craft Beer Industries in San Diego and Tijuana (2005-2015)**, highlighted trends similar to those observed in this research. Mallinger noted a **significant difference in the location of breweries between the two cities**. In San Diego, breweries are dispersed across various neighborhoods, integrating into the local community and making craft beer accessible to a broader audience. This distribution helps stimulate local economies and fosters a sense of community throughout the city. Conversely, in Tijuana, breweries are centralized in the downtown area, designed to cater to tourists who prefer visiting multiple breweries in a compact region. This centralization simplifies logistics for visitors but limits the spread of economic benefits to other parts of the city.

San Diego's craft beer scene is further bolstered by events like **Beer Week**, which **attract substantial tourism and showcase the city's vibrant brewing culture**. These events draw visitors from across the country, contributing significantly to the local economy. In contrast, Tijuana, despite its reputation challenges, benefits from regional events such as the **Ensenada Beer Festival**, which attract beer enthusiasts to the Baja California region. These festivals help elevate Tijuana's profile and demonstrate the city's growing potential as a craft beer destination.

Mallinger also addressed sustainability concerns, noting that both San Diego and Tijuana face **water scarcity issues**. In Mexicali, for instance, a referendum halted the opening of a brewery due to water resource concerns, reflecting the community's prioritization of agriculture over industrial expansion. This situation underscores the broader challenges that craft breweries face in balancing growth with environmental sustainability, a theme central to the industry's future.

Environmental sustainability is a shared concern in both San Diego and Tijuana, particularly regarding water usage. In Mexicali, a referendum to open a brewery was voted down due to the community's priority on water for agriculture.

Finally, the topic of **Americans' perceptions of the city of Tijuana** was addressed, as it was learned during informal conversations with Julie Wartell and others that they saw Tijuana as a place where, alcohol being allowed from the age of 18, they **would hold college parties**. Currently the perception of Tijuana, taking away the fact that it is always perceived as a dangerous city, has changed thanks to the development of the craft beer, wine and food sectors that **have elevated its tourism** "and so, yeah, the wine, the food and the beer kind of all kind

of growing and becoming very popular at the same time really helped because even within Mexico, like, Tijuana there's nothing to do." ¹⁰⁸

Regarding **industry associations**, conversations with the San Diego Brewers Guild and San Diego Brewcycling Collaborative provided additional context.

The **San Diego Brewers Guild** is San Diego's trade association founded in **1997**, the year during which many craft breweries began to develop. The guild provides for the participation of various figures who are part of the craft beer industry, as not only brewers can join it, but also raw material suppliers and distributors, with a view to **facilitating relationships between the different players**. It turns out to be active throughout San Diego County, with the relevant decision-making body being composed of people who work in different breweries in the city of San Diego.

It was possible to learn, following a meeting of the Guild, about the decision-making body, which explained how it works and the benefits those who join it have. The Guild, in fact, **is responsible for giving greater visibility to the breweries that join by organizing festivals**, such as Beer Week, which is organized every year in September, and for maintaining the high standard of craft breweries through **weekly meetings with focus on various topics** including the importance of raw materials, environmental sustainability, and economic management of the business.

To gain an in-depth understanding of waste management practices in the craft brewing industry, a contact was established with the **San Diego Brewcycling Collaborative**, an organization dedicated to recycling brewery waste. Founded by **Natalia King Quick, Fiorella Rossel Borkert, Romi Rossel, Luke Suttemiller, Steve Weihe, and Tom Kiely**, the Collaborative is entirely volunteer-run and focuses on coordinating waste collection from various breweries.

The organization operates two primary projects: BrewSCRAPS and Plastic to Pavement. **BrewSCRAPS offers breweries a recycling solution for disposing of malt and grain bags, shrink wrap, PET strapping, cardboard, and aluminum**. Volunteers collect these materials using their own vehicles and transport them to a central collection point at Juneshine, a kombucha brewery. Waste Control Inc. then takes over, selling the collected materials to Maco Recycling for pelletization. Although the project currently involves only ten breweries due to the lack of a dedicated transportation system, it has successfully diverted approximately 90,718 kg of waste from landfills, indicating its potential for broader impact.

The **Plastic to Pavement project focuses on recycling plastic can holders**, preventing them from ending up in landfills. Instead, these holders are repurposed by MacRebur Southern California, which incorporates them into asphalt production, reducing reliance on fossil fuels. This project has seen more widespread participation, with around 48 breweries involved, and annually recycles approximately 2,268 kg of plastic. Consumers are encouraged to return plastic holders to participating breweries, fostering a culture of environmental responsibility.

These initiatives highlight the significant role that grassroots efforts can play in **promoting sustainability within the craft brewing industry**, setting a precedent for similar communities to follow.

Alongside the field research conducted in the craft brewery sector in the city of San Diego, a similar investigation was carried out in the city of Tijuana.

The initial site visit involved participation from industry experts from the region, including Professor Julie Wartell, Gregory Mallinger, Josh Newton (who authored the case study chapter on Building Stone Brewing in Julie Wartell and Neil Reid's book) master brewer **Rudy Lopez**, and beer **blogger Patricia Castillo of Iwannabeerwithyou**. Thanks to Castillo's organization of the main brewery tour in the city, it was possible to explore some of Tijuana's prominent breweries.

As previously mentioned and reiterated during the site visit, Tijuana's craft beer sector has experienced significant growth due to its proximity to San Diego and, notably, the willingness of **San Diego's master brewers to share their skills and knowledge with those in Tijuana**. This has fostered strong relationships between breweries in Tijuana and those in San Diego, with **several collaborations underway**.

The first tasting room visited was located within the Telefónica in Gastro Park, namely **Cervecería Lírica**, a microbrewery housed in a former telephone company, which was previously a garage, retaining its original exterior appearance. This small-scale operation is particularly interesting as it **sources its raw materials from Baja California or Tijuana**.

The tour continued downtown, in the famous Avenida Revolución, visiting **Teorema brewery's tasting room** and **La República de Hops brewery**, which not only sells its own beers but also those produced by other microbreweries in the city to increase their visibility.

During the second part of the day, two of Tijuana's historic brewpubs were visited, one established in 1997 and the other in 2015. **Mexica Cervecería Artesanal** is one of the city's oldest breweries, originally named Aztec Cervecería Artesanal. However, due to sharing a name with another historic Mexican brewery, the owner was compelled to change it. The company is now run by two women, who took over after their father's passing, with one handling financial management and the other overseeing production. **Norte Brewing** is particularly unique, operating as a **speakeasy hidden within the city**, evoking the essence of establishments that emerged in the U.S.A. during Prohibition. The brewpub is situated on the **fifth floor of the Foreign Club's multistory parking lot**, where the production site is also located.

Finally, the last tasting room visited was **The Beer Garden**, which does not brew beer but offers various local craft beers for sale.

The second site visit focused on a single brewery, **Farland Brewery**, to gain an in-depth understanding of the beer production process, which was precisely documented in Chapter 5.5, along with the outputs from the production process.

In addition to observing the production process, a comprehensive understanding of the operation was gained through an interview with owner and founder **Gerardo Grijalva**.

The idea of establishing the family-run Farland Aleworks Brewery emerged in **2019** from architect Gerardo Grijalva and his cousin, who began experimenting to produce their first barrels of beer. Despite facing challenges **due to the COVID-19 pandemic**, they delayed the **opening** and eventually launched the brewpub **on November 4, 2021**.

Farland's concept revolves around **comics and science fiction**, a passion shared by the owner and his cousin. The name "Farland" represents their interpretation of a utopian happy place. The brewpub's logo features the silhouette of a genderless traveler, **"El Viajero"**, behind which is a space-time portal "So he travels through time and space in

search of his favorite beer and his favorite place." ¹⁰⁹ The brewery's beer names are inspired by cartoons and comics, reflecting the style of beer produced. The most striking example is that of the pilsner-style beer "Bapa di Bopi," which is reminiscent of the Italian Moretti of which Gerardo Grijalva discovered himself a lover during a trip to Italy. The name, precisely, comes from an episode of *The Griffins* where, Peter Griffin, imitates the Italian language by saying "Bapa di Bopi."

The **concept extends to the interior decor**, with a large chandelier simulating a portal on the ceiling, leading users from the ground floor to the rooftop terrace, currently under construction. The aim is to transport patrons to another planet, differentiating the upper level with distinct food and drink offerings.

Unlike other breweries primarily located in the city center, Farland is **situated in the 20 de Noviembre area**, well-known to the owner. It is a developing zone with several offices, adjacent to a poorer area of the city. The contrast is evident from the terrace, offering views of tall office buildings on one side and dilapidated low-rise houses on the other.

Inter-brewery relationships are plentiful and crucial for sector development. **Collaborations may involve cross-border visibility or knowledge exchange**. To underscore the importance of collaborations, Gerardo Grijalva states, "actually this brewery would not be what it is right now without the help of many of the people from the industry locally and internationally." ¹⁰⁹ Farland received support from the master brewer of Coronado Brewing, now a South Norte brand developer, who shared their knowledge.

Currently, Farland actively collaborates with various breweries on both sides of the border, producing joint beer batches to increase brand visibility. Another active collaboration in Tijuana **involves small breweries helping each other by supplying raw materials** when needed.

Farland is still in development, with **several ongoing projects**. The first, previously mentioned, involves building the second part of the venue on the rooftop. The second project aims for self-sufficiency by utilizing energy from 93 solar panels installed on the roof.

In conclusion, the interviews and fieldwork have proven pivotal for the thesis research. The insights gathered will lay a solid foundation for launching an innovative project aimed at leveraging the region's qualities systematically. Fully immersing into the context has allowed grasping the experiences and perspectives, working from the ground up rather than top-down.



5.8

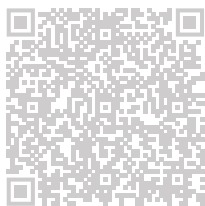
beer ecosystem

By integrating the findings from both territorial and sectoral research, an analysis of existing relationships in the region and an **examination of various craft breweries** were developed.

The analysis of breweries within the San Diego-Tijuana region encompassed **97 identified craft beer companies: 77 in San Diego and 20 in Tijuana.** ¹¹⁰ These companies are distributed across **146 locations** where craft beer is produced or consumed, with **115 in San Diego and 31 in Tijuana.** These establishments are categorized as follows:

- **2 breweries** (1 in San Diego, 1 in Tijuana), which solely contain production facilities.
- **56 brewpubs** (50 in San Diego, 6 in Tijuana), each integrating a production facility and a pub.
- **27 tasting rooms** with integrated production sites (18 in San Diego, 9 in Tijuana), combining a tasting room with an on-site production facility.
- **32 pubs** (29 in San Diego, 3 in Tijuana), which offer craft beer alongside food service.
- **24 tasting rooms** (16 in San Diego, 8 in Tijuana), dedicated to the sampling of craft beer.
- **1 taproom in San Diego**, which sells craft beer produced by the hosting brewery as well as by other breweries. ¹¹⁰

Through this analysis, it has been corroborated, consistent with the findings from the historical sector study, that **two distinct "craft beer revolutions"** have indeed occurred. The **first wave** emerged in the **early 1990s** and was spearheaded by some of **San Diego's pioneering** and longest-standing breweries. The **second wave**, commencing **around 2010 and extending until 2023**, involved breweries from **both San Diego and Tijuana.** This latter "craft beer revolution" was notably characterized by the rise of **homebrewers**, most of whom held degrees in various fields. These individuals chose to pursue their passion by **founding brewpubs or small breweries** with tasting rooms. ¹¹⁰



authors' note

Scan the QR code to read the detail of the analysis conducted on breweries

In analyzing the **focus areas** that shape **corporate style and mission**, certain recurrent themes have been identified among the companies studied. These themes include **environmental sustainability, social well-being, civic engagement, cultural involvement, and pet-friendliness**.

The research conducted did **not permit the identification of focus areas** for every company, notably for **15 companies located in San Diego**. However, among those companies for which relevant data was obtainable, the most significant areas of interest are: **environmental sustainability**, cited by **24 companies** in their mission statements; **social well-being**, emphasized by **17 companies**; **civic engagement**, a priority for **13 companies**, particularly regarding the health of their respective neighborhoods; and **pet-friendliness**, with **10 companies** organizing events related to this theme.¹¹⁰

The analysis corroborated findings from the field research on the **collaborative efforts** among craft breweries in the region, confirming that **numerous collaborations** do exist. Collaborations with **NGOs** were identified where possible, primarily focusing on **environmental initiatives**, such as those with San Diego Surfrider, **human rights advocacy** like Proyecto Albo de Fundación Gaia, and **gender rights** within the **craft beer sector**, exemplified by partnerships with Pink Boots Society, Pints 4 Pink, Women of the Revolution, Mujeres Brew House, and San Diego Girls Pint Out.¹¹⁰

Regarding membership in trade associations, which confer benefits such as increased visibility, it was found that **59 breweries** are affiliated with the **San Diego Brewers Guild**, and **21** with the **California Craft Brewers Association**. Notably, **none** of the breweries in Tijuana are affiliated with any trade association.¹¹⁰

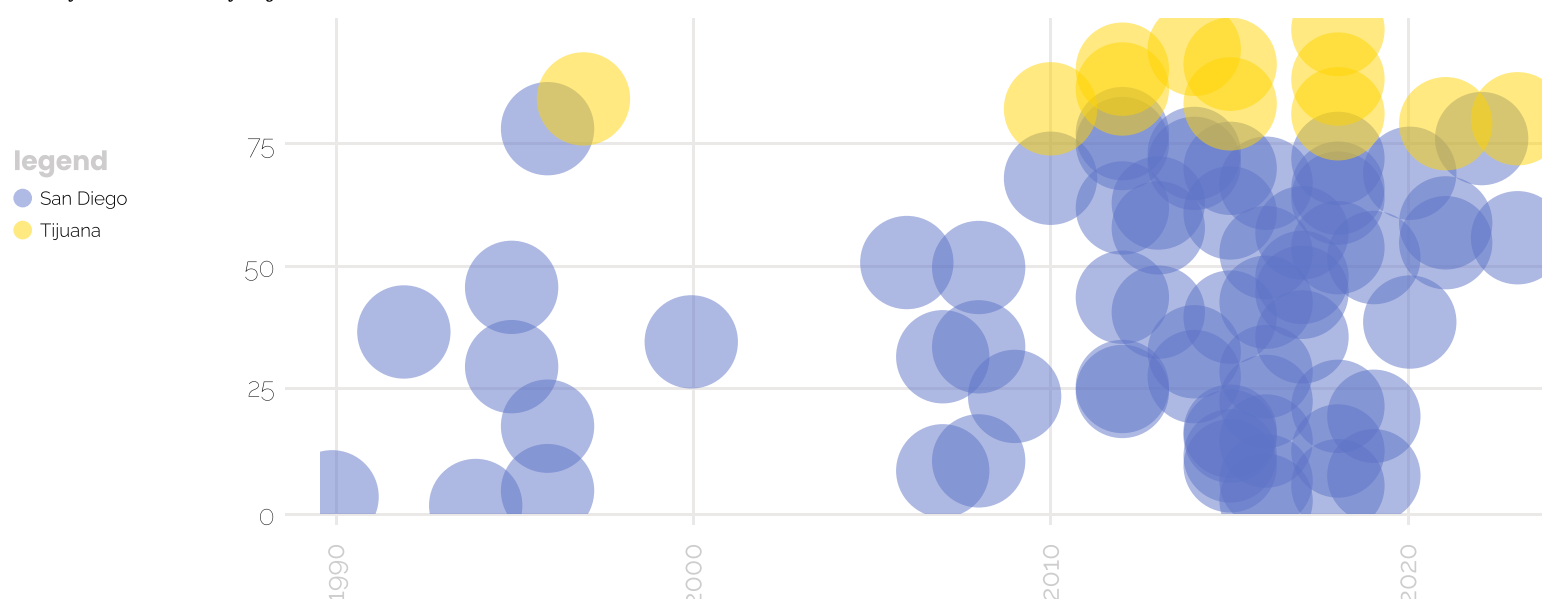
Further investigation into brewery participation in initiatives led by the **San Diego Brewcycling Collaborative**, identified during both the regional and sector analyses, revealed that **14 breweries** are involved with this organization.¹¹⁰

To analyze the range of experiences offered, common activities were identified, including **sports on TV, live music, yoga, art events, mug clubs, food events, puppy events, and trivia games**. This diverse array of experiences allows businesses to appeal to various target audiences, thereby increasing consumer traffic. For instance, the research revealed that trivia games tend to attract a **younger audience**, yoga appeals primarily to **women aged 35 to 50**, and food events draw **groups of friends and families with children**.

Upon reviewing the experiences offered by the companies, it became apparent that all establishments, equipped with one or more televisions, host events where patrons can watch sports together and offer opportunities for live music performances. These events are among the most common because they require **minimal organization**.

Among other types of events, the most favored by the companies are **trivia games** (offered by **26 companies**), **food events** (**14 companies**), **art events** (**12 companies**), and **mug clubs** (**10 companies**).¹¹⁰

Year of Establishment of Regional Breweries.



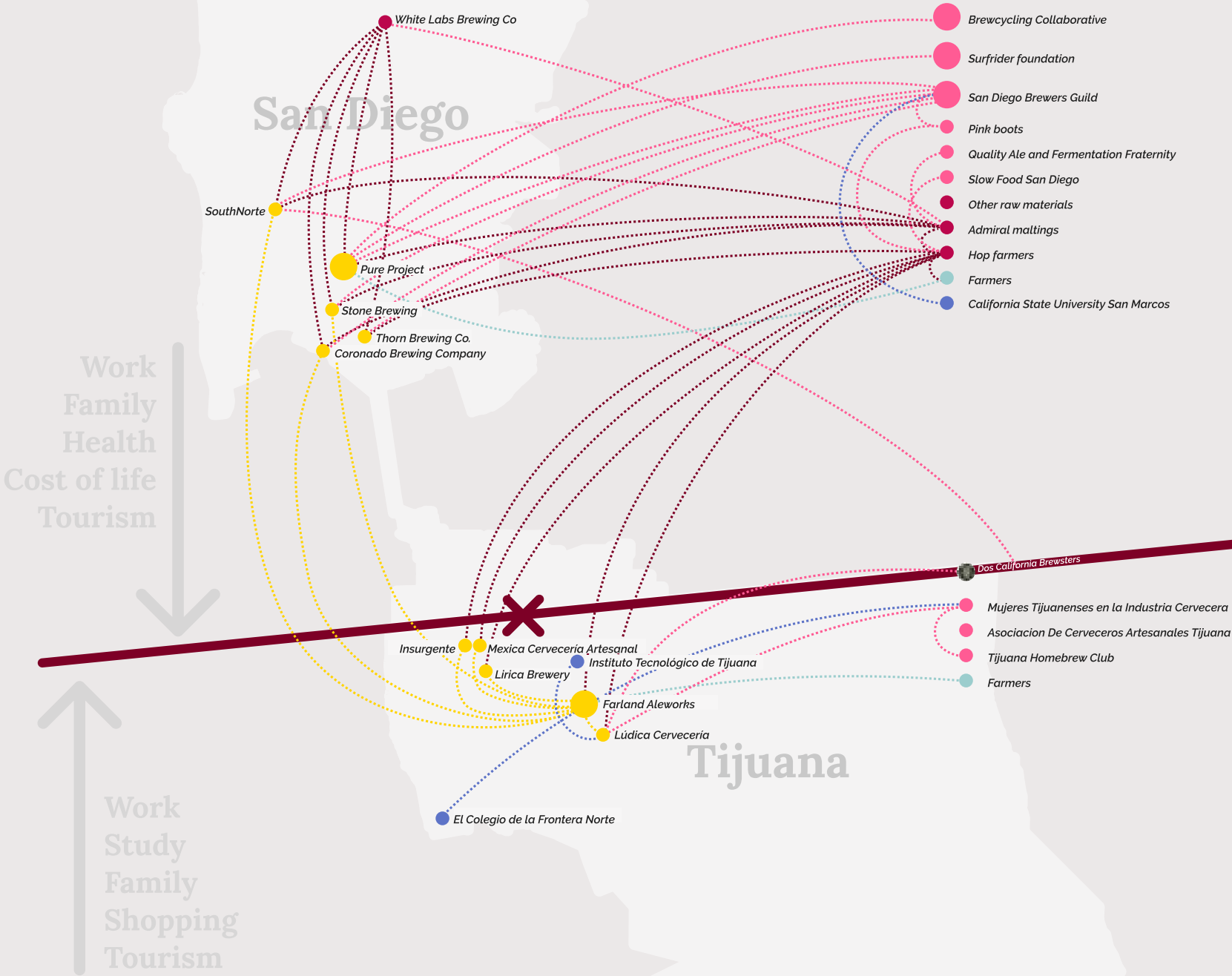
Beyond the border

through beer

“There’s a line between Northern Baja and Southern California but nature knows no such borders and, neither does food nor the people.”

Cali Baja Cuisine, 2023

97 km + 160 million \$45 billion
length of the border cross the borderpeople/year cross-border trade/year



legend

● Interviewed ● Breweries ● Suppliers ● University

● Not-interviewed ● Associations ● Waste management

the system

Through comprehensive research involving a holistic analysis of the territory, the craft beer sector, and specifically the breweries within the San Diego-Tijuana region, a detailed **relational map** has been developed.

This relational map **synthesizes data** derived from the local breweries' database, field observations within the craft beer industry, and an in-depth analysis of the territorial context. It provides a visual representation of the **region's internal dynamics**, focusing primarily on the **interactions among regional breweries**. The map elucidates their **interrelationships and connections** with various **industry associations**. Furthermore, it incorporates the **daily cross-border movements** at the San Ysidro port of entry, contextualizing these patterns within the framework of **brewery and association relationships**.

The relational map is not merely an analytical tool but also serves as a **robust communication medium** for explicating the **current system** and the **existing relationships among regional actors**. It facilitates the **identification of collaboration opportunities**, the **formulation of development strategies**, and offers profound insights into the role of breweries within the **regional and cross-border context**.

Consequently, this map offers a detailed and tangible depiction of **sector dynamics**, underscoring the **critical economic and social interconnections** that **define craft beer production** in the region. It also illustrates the **impact** of the territorial context **on cross-border activities**, thereby contributing to a more nuanced understanding of the **industry's regional and transboundary dynamics**.

5.9

towards the project

Desk and field research have made it possible to identify the **fundamental characters** of this sector, which moves from drives that come from a congruence of supply and demand. What emerges from the analyses is a world that goes far beyond the mere consumption of the alcoholic beverage, and is characterized as a ritual and communal experience, with a strong sensory component to be traced in the research and attention to detail, not only in the choice of aromas, but also in the way it is consumed.

Craft beer, therefore, appears as a **symbol of collaborative and creative change** aimed at **sustainable development**. Retracing the steps of history, beer has proven to be a **unifying element and a socio-economic engine**. The cooperation typical of these environments and the culture within them underscores craft beer's potential to build cultural bridges and promote inclusive and sustainable economic growth.

challenges of the industry

Coming to the end of the analysis, it seems clear that it is necessary to outline the challenges that the sector still needs to face in order to be able to start the desired **"economic-environmental-social convergence revolution."** These challenges can be associated with different areas:

- The first concerns the effort in **promoting inclusiveness** within the **craft beer movement**. The Brewers Association, the trade association, has recognized this problem of **lack of racial and ethnic diversity**, and is working to implement initiatives to attract a more diverse audience. To date, in fact, the audience that attends such settings is **primarily male**, more than **60 percent**. Recent studies show that the female audience is growing more and more. The same consideration is revisable in identifying the **origin of the audience**, most of whom describe themselves as **white**, about **89.5 percent**, with **18.5 percent** identifying themselves as **hispanic**. Finally, frequent visitors to craft breweries appear to be consumers with a **high average education** and income, willing to spend more on quality products with a **strong connection to the local area**.⁶⁷
- Regarding the **environmental plan**, many steps still need to be taken in this regard by **individual contexts**, however, **collaboration** at the **regional level** could help small business owners make the right choices in the shortest possible time. This concept is closely related to the idea that **"bioregional" communities** forged around shared ecological systems may serve as an important resource for creating **social-ecological resilience** in politically divided territories.¹¹¹
- Finally, from an **economic perspective**, many studies show how the economic gains of breweries "cannot be achieved unless social gains are pursued as well."¹⁰ In some ways, it can be said that the **economic growth and expansion** of a brewery is viewed favorably if a strong link is perceived between individual and collective gains.

The aim of this project is to foster communication, create a network among regional breweries, and enhance their heritage with a focus on sustainability.

By directly addressing sustainability and increasing awareness among craft brewery users, we anticipate two primary benefits.

Firstly, the breweries themselves will benefit from this initiative by gaining access to new market segments and implementing sustainable practices, thereby fostering growth within the regional sector.

Secondly, the broader community will benefit by promoting regional unity and overcoming prejudices through collaboration and heightened awareness.

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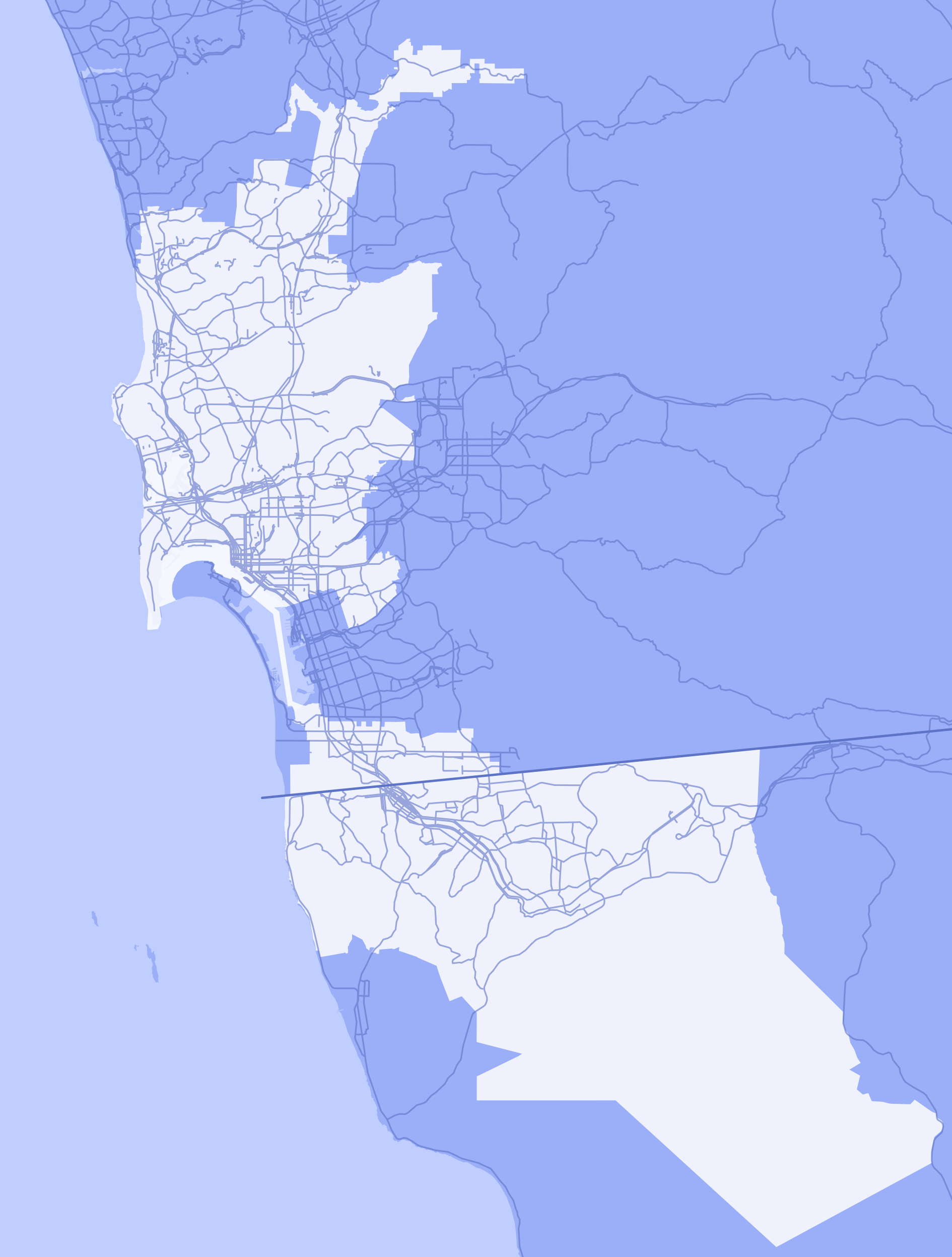
a new beginning

This volume **has presented an overview** starting from the analysis of the World Design Capital, focusing on the region designated for 2024, namely San Diego and Tijuana. The analysis then delved into a deeper exploration of global borders, their peculiarities, history, and categorization. Subsequently, the **methodology was illustrated**, integrating three distinct disciplines: one from the realms of anthropology and ethnographic philosophy, represented by **postcolonial studies**, and two from the field of design, specifically systemic design and **design from peace**.

These chapters formed the **foundation** for constructing the desk and field research, which implemented the systemic methodology, beginning with a **holistic analysis of the territory and the sector**. The holistic analysis highlighted two fundamental aspects that encapsulate the typical **cross-border culture** of the region. The first is represented by the **unique language** used for communication within the region, known as **Spanglish**. The second aspect is the **cuisine**, particularly **Cali-Baja cuisine**, and notably the **craft breweries** in the region.

Craft breweries not only represent a **unique and distinctive element** but are also **integral to daily life**. Therefore, they have been selected as the system from which to initiate the **systemic "revolution"** in the region. Together, these reflections have led to the definition of a **project scenario**, useful for systematizing challenges and exploring potential solutions. Specifically, the focus has been on harnessing creativity, a significant intrinsic resource in the sector, to convey the circularity and heritage of the area between San Diego and Tijuana.

These elements will be further explored and developed in Volume 2 of this work, where the subsequent phases of the project will be presented.



Craft beer as an engine of change:

using systemic design to foster connections
in the San Diego-Tijuana cross-border region,
World Design Capital 2024.



**Politecnico
di Torino**

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Candidates

Aline Di Campi
Giulia Galante

Supervisor

Prof. Pierpaolo Peruccio

Co-supervisor

Prof. Mai Nguyen
Prof. Gianluca Grigatti

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A NEW BEGINNING

gate

Considering the research conducted in the previous volume, the **possibility of developing a system** centered around the **breweries in the region** has been highlighted. The project scenario identified at the conclusion of the previous volume now lays the groundwork for **identifying challenges and opportunities**. These phases are crucial in guiding the current brewery system towards a **future-oriented convergence**.

This volume will address the **stages of project development**. Beginning with the identification of criticalities and potentialities that emerged from the previous research, this thesis will pinpoint the most relevant **challenges and opportunities** in relation to the **context and objectives**. This preliminary analysis phase is essential for fully understanding the current dynamics of the regional brewing industry and for outlining **effective intervention strategies**.

Once the project direction is identified, involving the application of **systemic design methodology** to develop **systems based on the regional breweries**, the actual project development phase will commence. This phase includes defining the most suitable methodology for project development and detailing the development stages.

Finally, the concluding phase will focus on the **qualitative evaluation** of the project. This evaluation will not only verify the results achieved but also provide valuable insights for future developments and interventions in the regional brewing sector.

the framework

1.1 CRITICAL EYE

1.2 THE FIL ROUGE

1.3 EVALUATIONS

1.4 AN OBJECTIVE

1.1

critical eye

Through a comprehensive **territorial analysis** of the San Diego-Tijuana region and the **beer industry**, conducted via both desk research and field investigations, significant **challenges and opportunities** have been identified. This analysis has elucidated the primary challenges inherent in these contexts. Recognizing these challenges is crucial, as they inform the **project direction** and **facilitate a detailed assessment** of the most coherent project possibilities. For each identified challenge, one or more corresponding opportunities have been subsequently identified, supported by existing **case studies** and **scientific research**.

A **holistic analysis of the territory** reveals various challenges and opportunities that could subsequently shape the project. The **criticalities and possibilities** identified are pivotal in addressing the **complex issues** of the **cross-border region**, particularly when viewed through the lens of systemic design.

Among the highlighted opportunities, the region's **historical context** stands out as a significant strength. It underscores the differences between the two cities while **emphasizing the similarities** that unify their inhabitants, thereby facilitating understanding on the two cities as a single, integrated region.

The substantial **presence** of **Non-Governmental Organizations** within the region represents a significant **opportunity**, given their engagement with various aspects of the region's complex issues. Establishing a **network** that includes these NGOs, especially those that align with the project's objectives, can further embed the project and the craft brewing sector within the local context.

Field research, particularly observations during the festival organized by the **Bountiful Bag association**, highlighted the emerging role of **conscious consumers**. Although such consumers **represent a minority** in San Diego and globally, their potential as the **future of consumption** underscores the necessity of considering their **preferences and behaviors** in the project design.

Additionally, both desk and field research underscore the prominence of **Cali-Baja cuisine**. This culinary style, which involves the **reinterpretation** of traditional Mexican dishes with **local ingredients**, is prevalent in both cities and serves as a **cultural and gastronomic bridge**. It accentuates a **shared regional identity** and could be leveraged to strengthen the cultural ties and **market positioning** of the craft brewing sector.

In addition to the identified opportunities, the territorial analysis has highlighted **two primary criticalities**. Although desk research indicates that a substantial number of individuals **cross the border daily** from both sides, a finding further substantiated by field research through direct interactions with various stakeholders, there remains a **pervasive prejudice** towards the city of Tijuana.

The second criticality pertains to the **limited integration** between the **cultural identity** of the region and the **craft brewing industry**.

In the analysis of the **craft beer industry**, several intriguing factors have emerged that present both opportunities and challenges which could potentially address systemic issues within the industry.

A **historical analysis** of the sector, particularly the **interconnected** histories of the two cities in the region, reveals significant potential through **existing networks** that should be strategically leveraged.

Two promising opportunities relate to the **management of organic and inorganic waste** from craft beer production.

Organic waste, notably rich in **nutritional value** for human consumption, is currently **underutilized** as animal feed.

Moreover, field research has highlighted the efforts of the **San Diego Brewcycling Collaborative**, an NGO dedicated to repurposing packaging waste from the brewing process, which offers a substantial opportunity to **reduce the environmental footprint** of the sector.

Conversely, criticalities have surfaced from **field research**.

It is noted that raw materials, such as barley malt and hops, often originate from **far away sources**, predominantly in North America or Europe for certain hop varieties.

Within the region, beyond craft brewery venues, there exists a notable **lack of infrastructure** that highlights the **sector's importance** to the cities, leaving tourists reliant on independent research or online resources. Additionally, it has been observed that staff within these establishments **may not consistently align** with the core values of their respective companies.

Based on the analysis of the breweries within the region, it was possible to identify the potentialities and challenges inherent to the San Diego-Tijuana area's craft beer sector. These analyses were essential to clarify the aspects that **link the craft beer industry** with the **regional context**.

The primary opportunity to be capitalized upon is the **collaborative model** revealed in the region. This model is exemplified by the **participation of several breweries** in the **San Diego Brewcycling Collaborative**, despite the logistical challenges identified in the sector's field research. Such collaboration highlights a commendable practice that could be further promoted to **enhance the industry's cohesion**.

Another significant opportunity involves breweries that have begun **cultivating or sourcing hops** from **local ranches**. This initiative, detailed in the database, presents a pathway for the development of craft beers with a higher proportion of **locally sourced ingredients**. Emphasizing local sourcing could enhance product **authenticity** and **foster stronger ties** with the regional agricultural sector.

The research uncovered several critical issues. Notably, a limited number of breweries possess **environmental or social certifications**. This lack represents a significant challenge, as certifications can enhance the **visibility and marketability** of breweries within an increasingly **sustainability-conscious market**.

There is also a **distinct scarcity of collaborations** between **breweries** and local **universities**. This lack hinders potential **advancements** in brewing techniques, **innovation**, and **research** that could arise from academic partnerships.

Both field and desk research indicate a pervasive issue of **ineffective communication**. This problem, coupled with a **lack of variety** in consumer **experiences**, restricts the engagement of informed consumers and the broader customer base with craft breweries. Addressing these communication deficiencies is crucial for **expanding consumer reach** and **enhancing the visibility** of the craft beer sector.

In conclusion, while the San Diego-Tijuana craft beer sector exhibits notable opportunities through collaborative models and local sourcing, it also faces significant challenges related to certifications, academic collaboration, and communication. Strategic efforts to address these challenges and leverage the identified opportunities could significantly **enhance the sector's development** and integration within the **regional economy** as well as present itself as a **model to be replicated and implemented** on other border locations.

an overview

The **challenges** arise from **critical issues** and **potentials** identified through desk and field research conducted in the San Diego-Tijuana region, focusing on the beer sector and analysis of local breweries. These eleven challenges have been categorized based on their **primary domains of origin**. Given the systemic nature of the research, **emphasizing interrelationships**, most challenges arise across **multiple domains**. Each challenge is categorized under its primary domain for clarity, with explicit connections to other domains also discussed. These challenges aim to address **complex issues** within the designated territory, impacting domains such as **heritage**, **market dynamics**, **cross-border community relations**, **environment**, and **human well-being** as identified in the research.

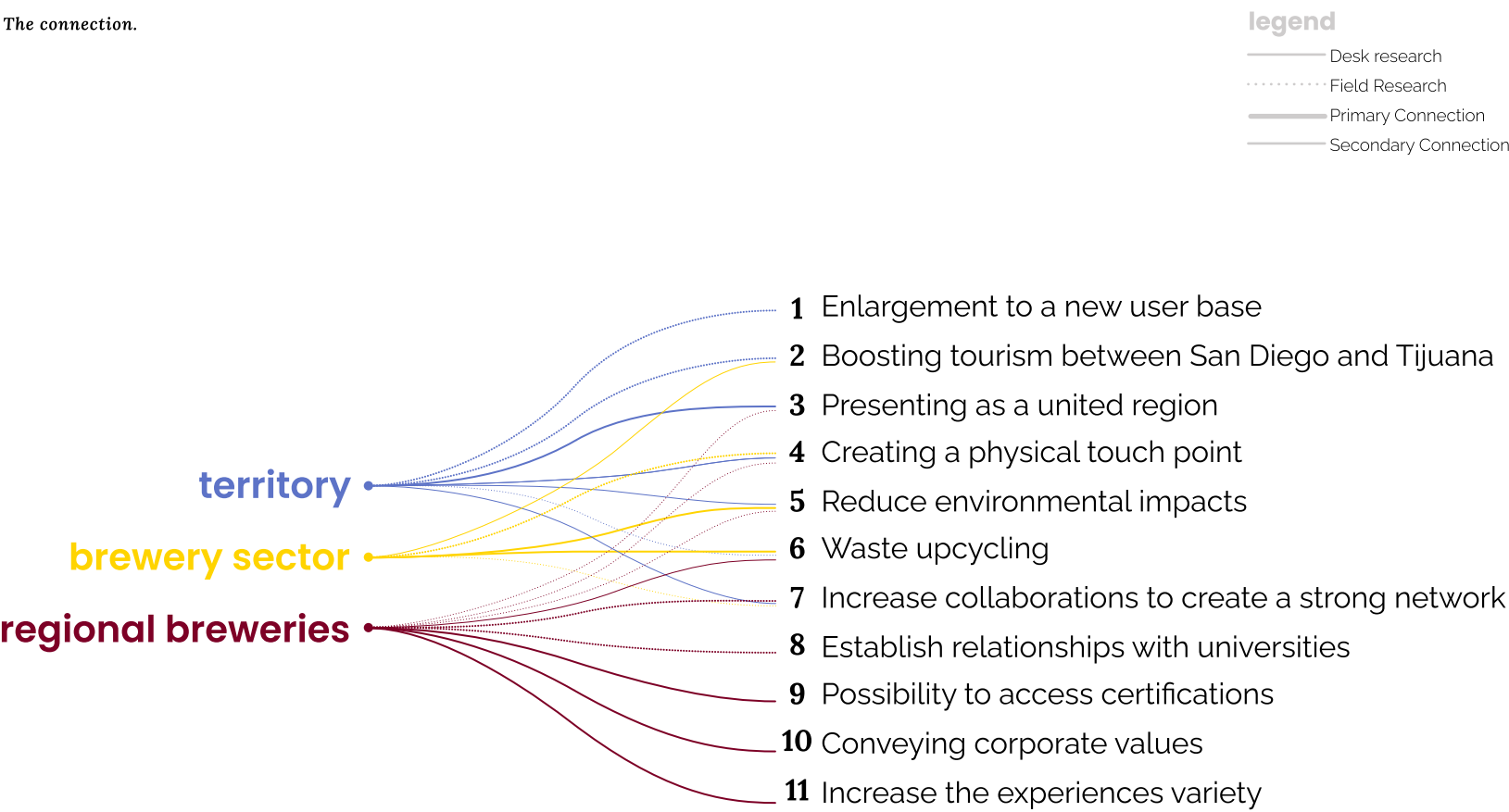
Where did the challenges come from?

from	territory	brewery sector	regional breweries
Field research	Enlargement to a new user base	Creating a physical touch point	Increase collaborations to create a strong network
	Boosting tourism between San Diego and Tijuana		Establish relationships with universities
Desk research	Presenting as a united region	Reduce environmental impacts	Possibility to access certifications
		Waste upcycling	Conveying corporate values
			Increase the experiences variety

It is crucial to view these challenges not in isolation but as **interconnected responses** to one or more issues identified during the research phase, representing critical issues and opportunities for both the region and the sector.

For each analyzed challenge, opportunities have been identified that can serve as case studies to effectively address the respective challenges.

The connection.





Juneshine (March 14, 2024).
made by the authors

#1 Enlargement to a new user base

This challenge arises from **field research** conducted in the San Diego - Tijuana region and observations made during visits to various breweries, brewpubs, and tasting rooms. It addresses the potential represented by the presence of a group of conscious consumers within the region.

In particular, direct observation revealed a **lack of specific infographics and communication regarding environmental and social sustainability** among brewery workers in all facets.

Strengthening this aspect could attract a **new target audience** to craft breweries, one that is more aware of the aforementioned issues.

Conscious consumerism aims to manage, through consumer choices, the **social and environmental impacts of consumption and lifestyle decisions** made by those who choose to "do the right thing". Statistics show that in recent years, between 2016 and 2021, there has been a 71% increase in

Google searches for sustainable goods, customers are willing to pay a 10% premium for socially conscious products, and **57% of respondents** in the McKinsey survey have made **lifestyle changes** to reduce their environmental impact following the Covid-19 pandemic.¹

Conscious Consumer

According to the Conscious Consumer Report by BBMG, authored by Raphael Bemporad and Mitch Baranowski,² those who identify as 'conscious consumers' are guided by five primary values when purchasing products:

1. **Salute e sicurezza:** Le persone vogliono prodotti naturali e sicuri ed evitano ciò che potrebbe danneggiare loro o l'ambiente. (trans. Health and Safety: People want natural and safe products and avoid anything that could harm them or the environment.)
2. **Onestà:** I consumatori si fidano delle aziende che sono sincere sui loro prodotti e su come li producono. (trans. Honesty: Consumers trust companies that are transparent about their products and how they are made.)
3. **Convenienza:** Le persone impegnate cercano opzioni pratiche che si adattino al loro budget e al loro stile di vita. (Convenience: Busy individuals seek practical options that fit their budget and lifestyle.)
4. **Relazioni:** I consumatori sono interessati alla provenienza dei loro prodotti e a chi li produce. Preferiscono sostenere le aziende locali e apprezzano i legami personali con i marchi. (trans. Relationships: Consumers care about where their products come from and who makes them. They prefer to support local businesses and value personal connections with brands.)
5. **Fare del bene:** Le persone vogliono avere un impatto positivo con i loro acquisti. Potrebbero scegliere prodotti ecologici o realizzati con pratiche di lavoro eque.² (trans. Doing Good: People want their purchases to have a positive impact. They might choose eco-friendly products or those made with fair labor practices.)



Balboa Park (March 7, 2024).
made by the authors

#2 Boosting tourism between San Diego and Tijuana

This challenge, like the previous one, arises from **field research** conducted within the framework of territorial analysis in the region, though it also relates to sector analysis of the beer industry. Specifically, it arises from the identified issue of **prejudice** among some individuals against **crossing the border to Tijuana**, and from the potential inherent in the **historical context of the beer sector** in the region.

In this case, the **main impacts** of the challenge are on the **market** and the **cross-border community**.

San Diego, like Tijuana, is known as the beer capital and attracts many **industry tourists**. As mentioned earlier, tourists are mostly drawn during city festivals, and currently **Tijuana lacks such events**.

Moreover, a quick Google search for "*Tijuana beer tours*" reveals that most of these tours **originate from San Diego**,³ symbolizing their belonging to a shared context.

It's not just Tijuana benefiting from cross-border tourism; San Diego also benefits, indirectly encouraging the **establishment of new breweries** in the nearby Mexican city and supporting them in **sourcing raw materials**.

Implement tours

Currently, there are various beer-themed tours that take tourists to taste the beers of different breweries in the cities of San Diego and Tijuana. In these tours, the two cities are considered separately, with the goal of creating a tour that crosses the border and involves interactive participation.

The case study under consideration is the one designed by Touch Media of the historic Route 66 passport. Passport holders collect stamps from 44 different carefully selected locations during their journey along Route 66, in addition to receiving complimentary souvenirs or discounts.⁴

Regional events

Every year, several events are held in the cities of San Diego and Tijuana that attract many tourists and encourage them to cross the border on both sides.

To date, there is no event shared by the San Diego-Tijuana region, therefore, it would be a good practice to create such an event.

#3 Presenting as a united region

Regarding the last challenge within the scope of territorial analysis, it arises from **desk research** and is closely linked to the analysis of breweries in the region. Specifically, it arises from highlighted opportunities such as the historical context of the region, the promotion of Cali-Baja regional cuisine, and the successful case of the existing network of craft breweries.

In this case, the **main impacts** of the challenge are on **heritage**, the **cross-border community**, and **human well-being**.

In the examined context of a region divided into two, with the north versus the south, the first world against the third, and San Diego against Tijuana, **beer emerges** as a **unifying force** capable of bridging two diverse cultures.

Through four critical points that must be overcome, the region can be further valorized and united:

- **Prejudices and perception** must be **overcome**;
- We need to focus on our **collective regional asset**;
- **Philanthropy** plays a critical role in addressing **unmet border challenges and needs**;
- Promote opportunities for **cross-border trade, commerce, tourism and cultural exchange** with migrant sending communities.⁵

Increase the employer diversity

In order to present the region as united and, more importantly, to include the diversity that characterizes it, it is important to increase diversity among workers. To this end, a The San Diego Brewers Guild has published a document in which a set of guidelines are provided for hiring and retaining a diverse team. Differentiation is a value today.

Enhancing the art of the region

Observation during field research in the cities of San Diego and Tijuana revealed that a strength is inherent in the murals that cover the bare walls of both cities. Currently they are already being exploited by both commercial and noncommercial entities to advertise themselves or convey messages.

Street art has the potential to be enhanced and to support regional unity by making the environment more welcoming, and conveying the message of a united region.

*Just a line (April 11, 2024),
made by the authors*





#4 Creating a physical touch point

*The Mass (February 11, 2024).
made by the authors*

This challenge arises from **field research** conducted within the realm of the craft beer sector, though it also relates to on-site analysis of craft breweries in the region and desk analysis of the territory. It addresses three critical issues highlighted across these areas: the **absence of central points of reference** within the city, the **presence of scattered events** that often prove to be disjointed, and the **lack of emphasis on connecting the region with the sector**.

The main impacts are felt on **heritage**, the **market**, and the **cross-border community**.

Through analysis of brewery websites and Instagram pages, which serve as primary communication sources for values, as well as industry association information, a significant issue was observed: **informations are fragmented** and often **unclear**.

Therefore, there is a need to establish a **physical location** where people, especially tourists

unfamiliar with the city, can access the information they need. Additionally, this physical point would serve as a **meeting place** for industry associations and enthusiasts.

Infopoint

Infopoints are characteristic of cultural events and cities aiming to showcase aspects that are typically dispersed rather than centralized. They serve the purpose of providing assistance to tourists, facilitating their exploration of the area under the guidance of local residents.

The provided case study focuses on infopoints devised for the 2014 Milan Furniture Fair by CM2.0 in collaboration with the Brera Design District. These infopoints were conceived as concrete monoblocs designed to be visually subtle yet functional, offering utility and attraction to the tens of thousands of visitors navigating the city in search of venues, events, installations, and performances.⁶

Museum

In depicting a region as cohesive, commencing from a historical perspective is paramount. This is especially pertinent for the craft beer capital, San Diego, and the birthplace of craft beer, Tijuana, to emphasize the historical roots that have earned them their respective titles. In doing so, not only can the history be celebrated, but also the collaborative spirit among the craft breweries of both cities.

This vision can materialize through the establishment of a dedicated craft beer museum, where enthusiasts and tourists alike can delve into the history and culture of craft beer in the San Diego-Tijuana region.

Currently, San Diego's proposed Beer Museum (MoB), designed by V Three Studios, promises to be a tasting adventure engaging beer enthusiasts with immersive exhibits and hands-on experiences.⁷

While the project is yet to commence, it might be intriguing to broaden its scope beyond beer tasting experiences to encompass the region's values encapsulated within the beer steins, thus incorporating Tijuana into the narrative.

Space to meet

Currently, craft beer associations, lacking a physical headquarters, convene, hold meetings, and organize events within the breweries that host them. While this is crucial for introducing participants to different breweries, it can lead to dispersion and create biases and preferences among breweries.

To gather all stakeholders within the craft beer sector, establishing a physical meeting point where non-profit organizations can come together and collaborate would be vital. Such a space could serve as a focal point for all meetings and the organization of workshops and events.



CAPATOAST E
BIOVA PROJECT
CONTRO LO SPRECO
ALIMENTARE

#5 Reduce environmental impact

This challenge primarily arises from **desk research** within the craft beer sector analysis, although it is closely tied to both territorial research and research on craft breweries in the region. It stems from opportunities highlighted for promoting Cali-Baja cuisine and the trend of some breweries beginning to grow hops locally in the region. Additionally, it addresses the critical issue of distant sourcing of raw materials. The main impacts are on the **environment** and **human well-being**.

As has been emphasised by the research, beer is the fifth most consumed beverage globally. ⁸ Therefore, to mitigate its environmental impact, it is imperative to start with **small-scale initiatives**, such as craft breweries, and gradually scale up to **broader reforms**.

It has been observed that the raw

materials used within the region are not all locally sourced. **Malt** is predominantly **imported** from the **northern United States**, while **hops** are sourced either from the **northern United States**, where major cultivations are concentrated, or from **Europe**, depending on the beer variety being produced. Although regional breweries primarily base their choice of raw materials on **economic feasibility** and **ingredient quality**, it is essential to consider a third factor: the **environmental impact** of **transporting** these materials.

The beer production process itself is characterized by **high energy and water consumption**. Energy is primarily expended during wort cooling (32% of total energy) and machinery operation (46% of total energy), with an overall consumption of approximately 2975 million kWh. ⁹

Water, which constitutes 90% of beer's composition, is used extensively not only in production but also for **cleaning purposes**. Producing **one liter of beer** requires approximately **4-7 liters of water**, depending on the beer style. In a region susceptible to **drought**, where water is a scarce resource, it is crucial to **monitor its use** due to its significant environmental impact. To address these challenges, several potential solutions have been identified that could effectively mitigate these issues.

preaudit				audit
Preliminary contacts: Inform and motivate	Pre - audit data acquisition	Processing of preliminary information	"Quick&Dirty" preliminary evaluation	On - site walk - trough energy audit



Wastewater beer aims to help quench US drought (October 9, 2023).
from BSSnews

Raw material from the region

To reduce the environmental impact associated with transporting raw materials, it is possible to examine a case study from San Diego: the Estate Beer Project. This case study, a collaboration between the San Diego Brewers Guild, Slow Food Urban San Diego, White Labs, Admiral Maltings, QUAFF, and the Seed Consulting Group, aims to produce craft beer using locally sourced ingredients to maximize the benefits derived from the region.¹⁰

Beer from bread

An Italian case study, specifically from the Piedmont region, is the Biova Project, a company previously mentioned. This company is noteworthy for producing beer from unsold bread, rice, and pasta. As an innovative start-up, Biova Project focuses on reducing food waste by creating products that adhere to the principles of the circular economy and upcycling.¹¹

Energy Audit

An Energy Audit is the first crucial step in assessing energy consumption and identifying energy-saving opportunities for the brewery. This requires evaluating the energy efficiency of both the production process and the brewery premises to pinpoint any inefficiencies.⁹

Changes in staff behaviour

To protect the region from excessive energy consumption, changes must go beyond merely replacing old machinery with new, energy-efficient models. "[...] changes in staff behavior and attitude also can have a great impact."⁹ Therefore, staff should be trained to adopt a more energy-conscious approach in their daily activities, enhancing overall energy efficiency throughout the brewery.

Use of renewable energy

An opportunity to address the challenge of high energy consumption impacting the environment is the use of energy generated from renewable sources. Sierra Nevada Brewery serves as an excellent case study in this regard, as its production process and premises are powered by solar energy from solar panels and microturbines fueled by biogas derived from wastewater treatment.¹²

Reuse water from greywater

Regarding the high water consumption in the beer production process, which impacts the environment, an opportunity is presented by examining the case study of Devil's Canyon Brewing Company & Epic Cleantec. In 2023, they produced beer using recycled greywater from showers, laundry, and bathroom sinks in a 40-story condominium in San Francisco, where Epic has on-site equipment to capture, treat, and reuse water for non-potable purposes.^{13 14}

	evaluation			proposal
Analysis of the Status quo	Conceptual design of saving options and initial energy targets	Energetic performances calculation and environmental analysis	Economic and financial analysis	Reporting and presentation of the proposal to the company



Spent Grains (April 11, 2024).
made by the authors

#6 Waste upcycling

Similar to the previous challenge, this issue primarily arises from **desk research** within the beer sector and secondary from **territorial** and **craft brewery analysis** within the region. It stems from opportunities such as **enhancing** the nutritional properties of organic waste generated during the production process, the presence of **various NGOs** in the area, and breweries' participation in initiatives led by the **San Diego Brewcycling Collaborative** focused on organic waste management.

The primary impacts of this challenge are observed in both the **environment** and the **market**.

Currently, organic waste from beer production, such as **spent grain and hot trub**, is typically **mixed and sold as animal feed** or processed into biogas through costly methods. In contrast, **inorganic waste**, such as packaging materials, is **sorted and recycled**.

While these practices effectively recycle production waste, there remains **untapped potential** to **further utilize** the residual properties of these **waste materials**.

Spent Grain

Given the high-value properties of functional compounds present in spent grain, such as non-cellulosic polysaccharides, proteins, polyphenols, fibers, and vitamins,¹⁵ this waste could be further valorized by introducing it into the human diet.

To achieve this, an additional production process is required, whereby the spent grain is collected, pressed, and dried. Once the grain is dried, it must be milled into flour. This spent grain flour can then serve as the base for various food products, including baked goods such as bread, pasta, cookies, muffins, and snacks, or it can be used as a high-value nutritional property thickener in products like yogurt, sausages, and juices.¹⁵

However, this flour cannot be used entirely on its own for the production of food products; it must be mixed with other types of flours. Table X shows the permissible percentage of spent grain flour that can be used based on the weight of the final product.¹⁵

Two case studies have been highlighted for this production waste.

The first case study features Angelo D'Addato, a baker born in 1969 and a Pharmacy graduate, who produces bread with spent grains from beer in San Ferdinando di Puglia.¹⁶

The second case study involves the use of spent grains for the production of dried pasta with enhanced nutritional properties. The company GEA has successfully converted the so-called spent grains from Ever Grain Brewing in Pennsylvania, which are often treated as waste.¹⁷

Hot Trub

Like spent grains, hot trub is typically mixed with spent grains and recycled in the same way, often used as animal feed.

Similar to spent grains, hot trub is a rich source of protein. However, since it consists primarily of hop residues, it has a very bitter taste.¹⁵

For this reason, it cannot undergo the same transformation process as spent grains. Instead, it must be collected separately and subjected to a five-stage aqueous extraction process at a temperature of 100°C for one hour. This process yields extracts that can be used as an alternative source of plant-based proteins.¹⁸

Yeast

Yeast can be reused for beer production up to a maximum of six times, after which it also becomes waste. It can be collected and subjected to three different processes to give it new life in various fields.

The first process involves the hydrolysis of yeast to utilize its nutritional properties as additives in mayonnaise, bread, vegan cakes, cooked ham, meat substitutes, and fruit juices.¹⁹ The second process involves cell lysis, through which yeast can be reused as a health-promoting ingredient in functional foods and beverages.¹⁹

The third process involves yeast hydrolysis and autolysis to transform it into an additive for the culture media of microorganisms that produce value-added compounds used in the food industry.¹⁹

Wastewater

Wastewater, which is collected from the water used to clean the machinery during the beer production process, must undergo filtration to remove any chemical components before it can be reused.

Initially, wastewater undergoes a physical treatment to eliminate solid waste, followed by a chemical treatment to neutralize the pH. Finally, it is subjected to a biological treatment.²⁰

Once treated, the water can be used to produce biogas rich in hydrogen and/or methane through either aerobic or anaerobic processes.²⁰

Two case studies illustrate how breweries transform their wastewater into methane-rich biogas.

The first case study involves the Sierra Nevada Brewing Company, which produces methane-rich biogas from treated wastewater. The recovery system captures this gas and uses it to power the facility's boilers, thereby offsetting the natural gas required for the system's operation.⁹

The second case study pertains to New Belgium, which has invested in an on-site process water treatment plant with a capacity of 225,000 gallons per day, incorporating anaerobic digestion. The company utilizes the methane produced by the digester to generate renewable electricity and heat in a cogeneration system.⁹

Packaging

With reference to the inorganic solid waste derived from the packaging used for the delivery of raw materials, there is an organization in San Diego dedicated to repurposing such materials. This non-profit organization is the San Diego Brewcycling Collaborative.

The objective of the association is to educate and engage the community in the sustainability of craft beverages.²¹

The association provides breweries and distilleries with the opportunity to positively impact the environment by reducing waste from the craft brewing process that would otherwise be destined for landfills or incinerators. Currently, the organization offers two recycling programs: BrewSCRAPS, which recycles malt and grain bags, shrink wrap, PET strapping, cardboard, and aluminum, and Plastic to Pavement, which recycles plastic can carriers.

#7 Increase collaborations to create a strong network

This challenge arises from research conducted on **breweries in the region**, although it is evident that it is also connected to territorial research and research on the beer sector. This challenge stems from three opportunities: the successful case of the **existing network** of craft breweries, the **presence of various NGOs** in the region, and the establishment of the San Diego Brewcycling Collaborative. In this case, the main impacts of the challenge are on the **market** and the **cross-border community**.

Despite previous research confirming that the craft beer sector in the San Diego - Tijuana region is a **virtuous example** of cross-border collaboration **among breweries**, to further enhance this area, the network needs to involve more stakeholders.

Collaboration and creativity are hallmark traits of the craft beer industry, as this sector has **geographic connections** among consumers, suppliers, and **other producers**.

As a result, *"the idea of place constitutes an information element for collaboration development, not necessarily creating boundaries in application scope, but certainly leading to a prioritization of who is important in terms of stakeholders".²²*

*Mujeres de tijuana y san diego se unen para lanzar una cerveza artesanal (March 25, 2023).
from El Mexicano*





Most important NGOs.

Open innovation

From the reviewed articles, which examined various case studies of breweries developing within a specific region, it becomes evident that sharing knowledge about sustainability and strategic information is crucial for companies. This practice leads to increased profitability, enhanced visibility, and a positive impact on the region.

The articles particularly emphasize that vertical collaboration, defined as cooperation among the primary actors within the sector, is essential. Such collaboration enables the production of high-quality products and yields numerous benefits, including the development of a knowledgeable workforce and increased profits for both craft breweries and other industry stakeholders.²³

Moreover, it is important to disseminate the knowledge and information acquired over time and through experience. This sharing facilitates the rapid development of new enterprises or those that are lagging behind. As a result, the entire regional sector can advance, achieving greater presence and visibility.²⁴

Increase collaboration with NGOs

Currently, donations to NGOs represent the only form of collaboration between craft breweries and regional associations. To establish a robust network between the craft breweries of San Diego and Tijuana and the region itself, it is beneficial to develop partnerships with non-profit organizations operating in the area. By building on the existing successful collaborations among the region's breweries, these partnerships can strengthen regional ties and enhance visibility.

To achieve this, several non-profit organizations have been selected, including industry-specific groups such as the San Diego Brewers Guild, Cerveceros Artesanales de Tijuana, Pink Boots Society, Mujeres Tijuanaenses en la Industria Cervecera, San Diego Brewcycling Collaborative, and Dos Californias Brewsters, the latter being a cross-regional association. Additionally, other non-industry organizations, such as the Surfrider Foundation, Afeet, and Fundación Gaia, have been chosen.

Brewing of "Regional" beer

Research into the craft beer sector has revealed that one of the primary motivations for collaboration within the region is for breweries to jointly produce a beer line. The case study under consideration highlights the associations Mujeres Tijuanaenses en la Industria Cervecera and Dos Californias Brewsters. In 2019, to further integrate the beer industry between San Diego and Tijuana, these associations organized the "Cocinada Binacional" with the participation of the SouthNorte brewery.²⁵

Direct collaboration with user

Another type of collaboration that can be enhanced is direct engagement with consumers, allowing them to participate in the production or customization of their favorite products.

An illustrative example is the case study involving the collaboration between a notable individual, Tony Gwynn, and AleSmith Brewing. In 2014, Tony Gwynn, known as "Mr. Padre," expressed his interest in creating his own beer with AleSmith Brewing. Together, they worked to perfect a beer that featured a savory and malty profile, with notes of tropical fruit and citrus hops, complemented by a slight caramel sweetness to add complexity and balance. This collaboration resulted in the creation of the .394 Pale Ale.²⁶



Gisel Library (March 5, 2024).
made by the authors

#8 Establish relationships with universities

This challenge arises from **research conducted on breweries** in the region, specifically highlighting the critical issue of little to no **collaboration between breweries** and universities in the area. The main impacts are on heritage and the cross-border community.

During the field research, it was observed that, unlike Italy, where it is common for universities to collaborate **with companies on student research**, this rarely or never occurs within the region.

As a result, it becomes much more challenging for businesses to **grow and innovate** while adhering to today's sustainability parameters.

Students share their knowledge with local companies

Numerous case studies highlight examples of collaborations between local companies and universities. One particularly illustrative case is the collaboration between Tenute Collesi Brewery and Camerino University.

This collaboration features a study conducted in 2019 by the Cosmetic Research Center of Unicam, which demonstrated the beauty-scientific efficacy of beer ingredients by analyzing products from the historic brewery.²⁷

#9 Possibility to access certifications

This challenge emerges from **desk research** conducted on craft breweries within the region, focusing on the critical issue of limited **availability of breweries with environmental or social certifications**. The primary impacts of this challenge affect the market, the environment, and people's well-being.

Certifications hold **increasing significance today**, affirming that company practices and operations align with environmental and worker-friendly standards. They also signal to consumers that **the company upholds its objectives and responsibilities**. In the food sector, certifications are particularly crucial as consumers with heightened awareness of their dietary choices can **easily identify brands** that reflect their values.

Raw materials certifications

Certifications for raw materials ensure that the ingredients used and production processes are environmentally friendly and culturally respectful. These certifications allow customers to immediately recognize products that align with their values. Several certifications have been identified for craft breweries, covering various aspects of raw material certification.

The Kosher certification ensures that food is suitable for consumption by the Jewish community. This certification is a service offered to food companies targeting national and international markets.²⁸ It was chosen because it respects the religious culture of a community.

Today, an increasing number of people are conscious consumers who make ethical choices, such as avoiding meat and its derivatives or buying organic products.

Among the ingredients added to characterize the aroma and flavor of beer styles are lactose, honey, oysters, and bacon. Therefore, it is important to identify vegetarian products, which do not contain ingredients of animal origin where the animal is killed or slaughtered, through certifications such as those provided by the American Vegetarian Association.²⁹ Similarly, it is important to identify products that adhere to vegan ethics, meaning they do not contain animal-derived raw materials and have not been tested on animals, through certifications such as those offered by Vegan Action.³⁰

The OTCO certification, provided by the USDA, which also offers certification services, verifies the use of organic products for companies that produce crops and livestock or handle organic products.³¹

To support craft and local businesses, the Craft Malters Guild offers the use of a seal designed to provide a key point of differentiation for guild member malt houses and the breweries and distilleries they collaborate with.³²

The Gluten-Free Certification Organization (GFCO) certification represents independent quality verification in meeting the strictest gluten-free standards.³³ This certification is important for including people with food allergies.

Finally, a certification that does not entirely pertain to raw materials but is essential for craft breweries is the Cicerone Certification. This certification allows individuals to quickly demonstrate a professional body of knowledge and essential tasting skills related to beer.³⁴

Sustainability certifications

Certifications related to sustainability attest that a company's practices and operations are respectful of both the environment and workers.

Various certifications have been identified for craft breweries, covering aspects of social and environmental sustainability.

The Life Cycle Initiative (S-LCA) certification assesses the social life cycle. This certification can be used to evaluate the social and sociological aspects of products, as well as their actual and potential positive and negative impacts throughout their life cycle. It examines the extraction and processing of raw materials, production, distribution, use, reuse, maintenance, recycling, and final disposal.³⁵

The certification provided by the Ethical Trading Initiative ensures that all members agree to adopt the ETI Base Code on labor practices, based on the standards of the International Labour Organization (ILO).³⁶

Regarding environmental sustainability certifications, these allow breweries to maintain high standards and embody values worth emulating.

The B Corp certification attests that a company meets high standards of verified performance, accountability, and transparency on factors such as employee benefits, charitable donations, supply chain practices, and input materials.³⁷

The Climate Neutral Certified certification assesses the carbon emissions impact of products and services from cradle to customer. Additionally, annual plans and progress towards reducing emissions in the value chain and achieving long-term goals are documented.³⁸

The 1% for the Planet certification verifies a company's commitment to donating 1% of their annual sales directly to selected environmental partners each year.³⁹

The Leadership in Energy and Environmental Design (LEED) certification is the most widely used green building rating system in the world. It allows craft breweries to not only certify their products but also their production facilities and premises.⁴⁰



#10 Conveying corporate values

Similar to the previous challenge, this issue arises from **desk research** conducted on craft breweries within the region, supplemented by **sector-specific studies**. It encompasses two critical issues: **inadequate communication** of craft breweries' values and insufficient staff training in some establishments. The primary impacts are felt in the market, the environment, and the cross-border community.

Through **analysis of craft breweries'** websites and social media, it became evident that company values are not consistently emphasized **compared to other information**.

Effectively communicating the values of one's company is crucial, as **users can identify with them and choose the craft brewery** because it aligns with those values. Furthermore, this can become **a way to promote conscious consumerism**, as it *"requires a change in management's attitude towards their enterprise's operation and acceptance of responsibility not only for shareholders and employees, but also for society, the environment, or suppliers"*.⁴¹

Study of effective storytelling

To effectively differentiate one's craft brewery from others, compelling storytelling is crucial. This allows breweries to connect with consumers by tapping into the emotions evoked by their story.

During a virtual conference themed around beer and navigating the industry, where various topics were discussed, speaker Julie Rhodes addressed this very subject. She emphasized the importance for brands to distinguish themselves through impactful storytelling, conveying why their establishment was created and how it sets itself apart from others. Key terms in this context include the uniqueness and authenticity of the brand, as well as the connection and loyalty it fosters with customers through storytelling.⁴²

Staff training

This opportunity is closely related to the previous one, namely study of effective storytelling, in that the staff working within the craft brewery must also be able to tell the storytelling of the company as they are the first to personally interface with the customer. In creating one's culture, it is important that it be recognizable by everyone, and the first way to do this is to train the people who come into contact with the customer.⁴²

Development of a Corporate Social Responsibility

In Europe, companies are paying more attention to environmental sustainability declined in the different aspects, such as raw materials, water consumption and the impact they have on the environment in terms of emissions and production waste. Companies must begin to neutralize the negative effects of their activities and uphold the principle of sustainable development. This paradigm is embodied in economic practice with the concept of corporate social responsibility (CSR).⁴¹

Involvement of the user

User engagement on environmental sustainability topics enables a company to educate its audience, fostering the development of a more conscious consumer.

Two case studies illustrate this approach.

The first case study examines the Sierra Nevada Brewing Company's website, which is dedicated to its environmental sustainability initiatives and can be navigated via an interactive map of the facility.⁴³

The second case study highlights the best practice of Lakefront Brewery, which has started organizing tours focused on its sustainable practices.⁴⁴



Tins of Glory (n.d.).
from Balter

#11 Increase the experiences variety

The final challenge stems from **desk research** conducted on craft breweries within the region, specifically highlighting the **critical issue of limited variety in consumer experiences**. This issue impacts both market dynamics and people's wellbeing.

In contemporary times, individuals increasingly seek **active engagement** and diverse experiences. Consequently, breweries organize events aimed at offering diverse **consumption experiences**. This strategic approach directly benefits breweries by attracting new customers with varied interests.

The identified **critical issue** revolves around the **lack of diversity** in the thematic content of these events.

Custom of labelling

To increase user engagement through organized experiences, the case study examines the personalization of product labels by users. Starting in 2014, Ferrero launched a campaign to boost customer participation and strengthen their connection to the brand with one of its flagship products, Nutella. This initiative allowed users to personalize the label, making it more appealing.⁴⁵

Engaging games

Currently, the games offered during beer nights primarily focus on trivia, as these can appeal to a larger group of people. However, incorporating new and more stimulating games, particularly organizing competitions, could effectively connect more breweries in the region and encourage people to travel across borders.

The case study examines the Tins of Glory Championship, organized since 2017 by Balter Brewery on the Gold Coast in Australia. Their invented game is similar to curling but is played on a brewery counter, with the beer itself serving as the puck.⁴⁶

Educational game for youngs and for adults

The best way to educate people has always been through play, as it allows themes to be learned while having fun, rather than being perceived as top-down education. To contribute to the creation of conscious consumers, breweries could organize evenings where environmental topics are addressed through games. Specifically, to highlight their production processes, the themes could include the raw materials used by breweries, waste management, and emissions, helping consumers understand Corporate Social Responsibility.

Games should not be limited to adults but also involve their families, including children. This approach will encourage future consumers to make ethical choices.

The first case study is the REMIDA center, which opened in 2006 in Turin. It is a space where industrial waste materials become educational resources for discovering, experimenting, and investigating matter, focusing on the process rather than the product.⁴⁷

The second case study, aimed at adult education, examines sustainability-themed educational games created by the School for Environment and Sustainability at the University of Michigan, which allow both adults and children to engage and test their knowledge.⁴⁸

1.2

the fil rouge

As mentioned previously, **each challenge** has been **individually examined** to ensure a clear understanding of the **issues addressed**. However, it is essential to recognize that these challenges, while analyzed separately, are **both interconnected and interdependent**. A comprehensive understanding of these highlighted difficulties can only be achieved through an **integrated approach**.

Each challenge identified within this context should not be **viewed in isolation** but rather as **part of a complex system**, where interactions between different issues can **amplify their overall impact**. Consequently, opportunities must also be evaluated in a similar manner, as an opportunity identified for one challenge often addresses multiple challenges simultaneously.

Adopting a **holistic approach** is crucial for **effectively managing** both challenges and opportunities. This approach allows for the identification of **synergies among proposed solutions** and **maximizes the efficiency of deployed resources**. Such an analytical approach not only enhances understanding of the complexities at hand but also facilitates the development of integrated and sustainable strategies to address them.

challenges connection

The various challenges are closely interconnected. To **fully understand** how these linkages manifest themselves, it is essential to carefully examine the figure below. This graphic representation provides a **clearer overview of the interconnections** that exist, enabling an integrated and detailed understanding of the overall context.

The initial challenge, **"Enlargement to a new user base"**, is inherently linked to **"Boosting tourism between San Diego and Tijuana"**. By enhancing interregional tourism, individuals will be exposed to a broader array of craft breweries, thus providing these establishments with the opportunity to expand their customer base.

The challenge of **"Boosting tourism between San Diego and Tijuana"** further aligns with **"Presenting as a united region"**. This objective aims to foster a seamless transition between the two cities through the San Ysidro Port of Entry, thereby **promoting regional continuity**. Moreover, this challenge corresponds with **"Creating a physical touch point"**, which facilitates a comprehensive understanding and general appreciation of the motivations for **cross-border travel**.

In relation to the challenge **"Presenting as a united region"**, the region must be perceived as cohesive from both **social and environmental perspectives**. A unified approach is essential for implementing regional actions effectively, thereby linking this challenge to **"Reduce environmental impacts"**. The establishment of networks among local stakeholders is critical, as these networks function akin to a spider's web, reinforcing the social, economic, and environmental fabric. This connection also aligns with the challenge **"Increase collaborations to create a strong network"**.

The challenge **"Creating a physical touch point"** provides a streamlined method for users to **explore** and understand the **craft beer sector within the region**. By consolidating information about local establishments, it offers an intuitive way for users to discover a wider variety of venues, thus connecting to both **"Enlargement to a new user base"** and **"Presenting as a united region"**.

Regarding the challenge **"Reduce environmental impacts"**, it is linked to **"Waste upcycling"** and **"Possibility to access certifications"**. Reducing environmental impact is directly associated with the upcycling of waste, which maximizes resources and minimizes impact. Additionally, access to environmental certifications enables better process control, leading to a **direct reduction in impacts**.

The challenge **"Waste upcycling"** is interconnected with **"Presenting as a united region"** as the unified management of waste from the craft beer sector **enhances the region's**

overall value. It also correlates with **"Increase collaborations to create a strong network"**, as increasing collaborations within the region facilitates the identification of new partners for environmental initiatives, thus optimizing **waste management**.

"Increase collaborations to create a strong network" is pivotal not only for fostering a united region and reducing the environmental impact of the sector but also for attracting a larger, more informed customer base. This challenge **links various stakeholders**, enhancing the range of experiences offered in local venues, and relates to both **"Enlargement to a new user base"** and **"Increase the experiences variety"**.

The challenge **"Establish relationships with universities"** connects to **"Waste upcycling"** and **"Increase collaborations to create a strong network"**. Universities, as primary research hubs with an interest in promoting circular economy practices, play a crucial role in advancing the utilization of local materials and enhancing regional sustainability.

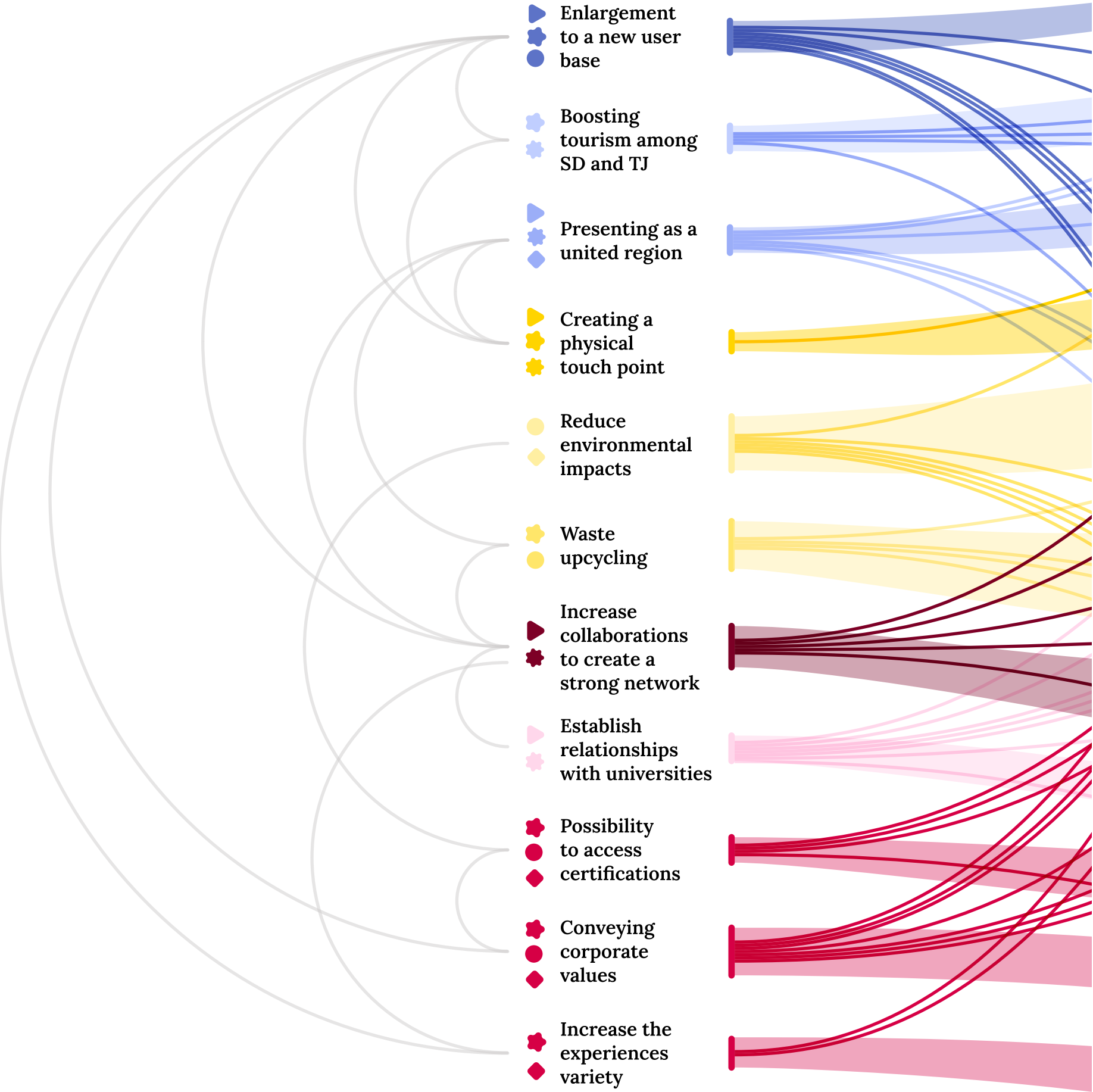
For the challenge **"Possibility to access certifications"**, there is a connection to **"Conveying corporate values"**. By clearly defining corporate values, businesses can seek social and environmental certifications that **reinforce their commitments** and **validate their operational practices**.

Finally, both **"Conveying corporate values"** and **"Increase the experience variety"** are related to **"Enlargement to a new user base"**. Defining corporate values and expanding the variety of experiences, particularly those with an **environmental focus**, can attract a more informed audience, thereby broadening the customer base of craft breweries.

Similarly, opportunities, in addition to meeting the challenge for which they were identified, also meet other challenges, again with the view that in order to **solve complex problems, solutions must be considered through a holistic view**.

Challenges & opportunities

the link



Legend

Challenges from

- Territory
- Brew sector
- Breweries in the region

Challenges connections

- High
- Medium
- Low

Opportunities connections

- Primary
- Secondary

Challenges impact

- Heritage
- Market
- Cross-border community
- Environmental
- People wellbeing



1.3

evaluations

After thorough analysis of the associated challenges and opportunities, and understanding their intricate relationship, it is essential to proceed with **evaluating opportunities** aligned with the **primary objective**. The selected areas for evaluation are critical in guiding the project towards its overarching aim of **establishing a robust network with regional actors that transcends internal boundaries**. These areas were meticulously chosen to ensure consistency with the thesis's goal, principles of systemic design, and the theme of the Design World Capital.

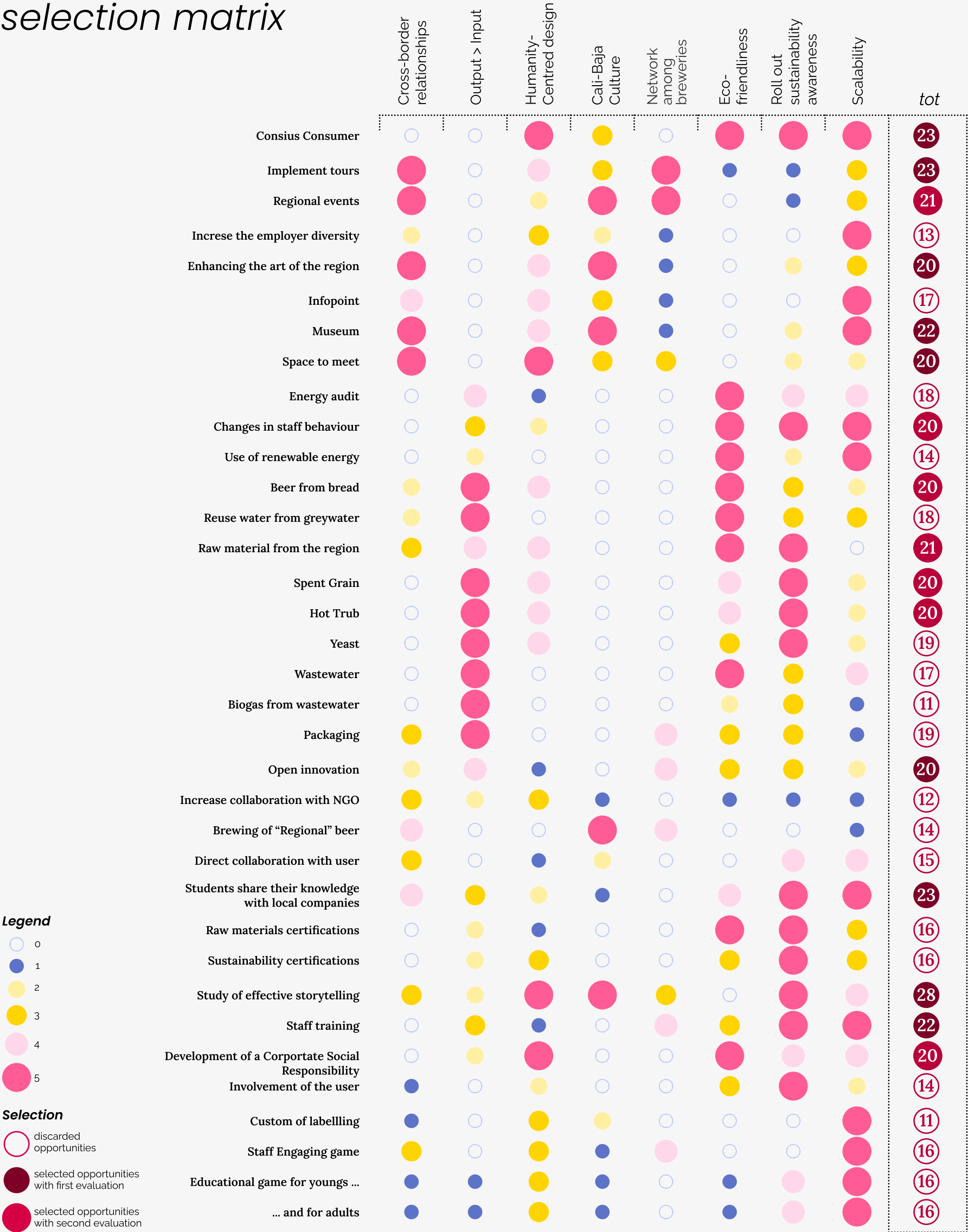
The criteria considered are:

1. **Cross-border Relationships:** Essential for enhancing regional cohesion by fostering cooperation and integration across national borders.
2. **Output > Input:** Emphasizes resource optimization, environmental impact reduction, and promotion of innovation within a circular economy framework.
3. **Humanity-Centred Design:** Aligns with the theme of World Design Capital San Diego - Tijuana, prioritizing human well-being and responsive design solutions.
4. **Cali-Baja Culture:** Recognizes local culture as pivotal for achieving the project's goals, leveraging regional cultural themes.
5. **Network among Breweries:** Expands collaborative models among craft breweries to stimulate innovation and sectoral growth through knowledge and resource exchanges.
6. **Eco-friendliness:** Ensures proposed solutions mitigate environmental impact effectively.
7. **Roll Out Sustainability Awareness:** Educates and promotes sustainability to drive behavioral change and support sustainable initiatives.
8. **Scalability:** Facilitates adaptation and replication of solutions across diverse contexts while considering specific complexities.

These criteria will guide the evaluation process to identify and prioritize opportunities that best support the project's objectives and contribute to sustainable regional development.

Opportunities

selection matrix



toward a new system

Opportunities were assessed based on the outlined criteria, using a scale from 0 to 5 where **0 indicates no influence and 5 represents maximum impact**. This systematic evaluation methodology ensures an objective measurement of **opportunity impacts**, facilitating strategic selection of the most promising options.

Following the initial evaluation, opportunities closely aligned with project objectives were preliminarily selected as particularly promising. However, a comprehensive **second phase** is essential to confirm their suitability within the specific context. This phase involves a **comparative analysis of remaining opportunities**, considering both objective merits and qualitative dimensions. Given the project's community impact, integrating perceptual elements into evaluation criteria is crucial. This approach helps **identify technically viable and operationally significant opportunities**. From an initial pool of 35 opportunities, the second phase focused on **18 options scoring 20 or higher**, excluding those below a predetermined threshold.

Feasibility within the analyzed context was a primary consideration in evaluating **remaining opportunities**. Field research identified an **environmental sustainability gap** requiring incremental steps, as disruptive innovation currently exceeds community readiness. Therefore, opportunities like **"Spent Grain"**, **"Hot Trub"**, and **"Beer from Bread"** were excluded.

Among remaining opportunities, the **"Study of Effective Storytelling"** addressing the challenge of 'Conveying Corporate Values,' emerged prominently with the highest score. This focus naturally precluded four other opportunities: **"Regional Events"**, **"Changes in Staff Behavior"**, **"Raw Material from the Region"**, and **"Development of Corporate Social Responsibility"**.

The final selected opportunities are as follows:

- Consius Consumer
- Implement tours
- Enhancing the art of the region
- Museum
- Space to meet
- Open innovation
- Students share their knowledge with local companies
- Study of effective storytelling
- Staff training

1.4

an objective

The **selected opportunities** form the foundation of the project. As previously mentioned, these opportunities arise from a **comprehensive analysis** conducted through research on **the territory, the sector, and the region's breweries**, addressing some of the identified challenges. Given that the sector within the region faces challenges due to environmental impacts, implementing gradual strategies for significant change is feasible. In this context, the **'Study of Effective Storytelling'** could represent a **crucial initial step**. Change begins with small actions that resonate both personally and collectively. Effective storytelling techniques can raise **awareness of environmental issues** and foster a **cultural shift** with a long-term impact.

Therefore, strategies such as **"Staff Training"** and **"Enhancing the Art of the Region"** are crucial. The narrative of breweries is intertwined with both the sector and the **territory where they thrive**. By understanding company values deeply, personnel can effectively convey their stories to users, influencing the narrative of a **region unified in the craft brewing sector**.

Implementing **interregional tours** can portray the entire region as a unified entity, encouraging citizens and tourists to perceive the craft brewing sector as one that represents both **society and the environment**, thus fostering a community working towards a common goal. This approach not only promotes tourism and bolsters the **local economy** but also **enhances cohesion and collaboration** between regions, thereby mitigating biases against Tijuana. By creating a tourist experience that integrates both sides of the border, bridges of **understanding and mutual respect** can be built, demonstrating that despite physical barriers, communities are connected by profound human and cultural ties.

Regarding the main objective's development, strategies like **"Open Innovation"** and **"Students Share Their Knowledge with Local Companies"** not only lay the groundwork for long-term sustainable development but also foster a profound connection between the **industrial sector** and the **local community**. Open innovation can address **social and environmental challenges** by leveraging diverse skills and solutions. Facilitating student collaboration with local companies offers mutual benefits: companies receive **innovative ideas**, while students gain **practical experience** and contribute to **local development**.

By conveying the values of a unified region under the banner of craft beer, it is possible to **educate consumers**, engaging them in an experience that goes beyond simply drinking beer. This attracts **"Conscious Consumers"** and strengthens the bond between consumers and local producers, consolidating the **district's identity** and **reinforcing community spirit**.

Looking ahead, this strategy could involve creating a **beer museum** and shared space dedicated to the region's brewing culture. The museum would celebrate the **tradition and evolution of craft beer**, highlighting its origins and network. The **shared space** would serve as a dynamic meeting point for industry associations, breweries, homebrewers, and stakeholders, fostering **knowledge sharing and innovation**. In summary, effective storytelling of craft breweries helps **create a cohesive regional identity** and lays the foundation for a thriving cultural and entrepreneurial ecosystem.

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the project

2.1 THE FOUNDATIONS

2.2 DESIGNING THE RELATIONSHIPS

2.3 HOW

2.4 DESIGNING THE LEARNING PROCESS

2.5 A SERVICE

2.6 THE OUTPUTS

2.1

the foundations

Starting from the analysis of the selected opportunities, an effort was made to **understand the relationships** between them, addressing both the specific challenges of the **territory** and the broader objectives of the **craft beer sector** in the region.

Firstly, effective narrative strategies are fundamental to supporting the entire project, not only because it can **raise awareness of regional issues** and **transcend boundaries through narration**, but also as a **dialogue tool on environmental topics, promoting the sustainable development** of the brewing sector. This objective serves as a catalyst for **fostering connections** within the territory, particularly with artists, who could collaborate with university designers to develop a common, shared visual language.

The study of a distinctive **visual language**, adapted to **reflect the unique characteristics** of each brewery, offers benefits not only for staff by **facilitating the communication of corporate values**, but also as a benchmark for the **competitive advantage of breweries**. These breweries, motivated by dialogue and with the support of industry associations, could become **aware** of the undeveloped environmental and social aspects within their companies and act to improve in an **open innovation perspective**, involving universities in implementing new solutions. This outcome would **promote sustainable development, encourage knowledge transfer**, and **strengthen the link** between the cross-border community and industry.

Training the personnel is identified as another crucial pillar for the proper functioning of various opportunities. Within the project's scope, the staff should be prepared to **answer to the questions** of the most **curious and informed customers**. The optimal approach is, therefore, to work by involving the entire brewery staff in implementing sustainable solutions aimed at **generating a new system**. Interaction with consumers is also a key aspect that characterizes the opportunity of the regional tour, offering a tangible experience that demonstrates the unity of the region beyond the border wall..

The analysis of the multiple opportunities leads to a further reflection: the users who participate in the experience will interiorise the lessons learned. This cultivates a **market of informed individuals** who value corporate choices and support local producers. In the future, thanks to the interventions not only of the breweries but also of the population, all this could lead the region to be recognized as a **leader in the sector** from various perspectives, primarily social and environmental. Therefore, following such recognition, it would be necessary to implement more opportunities.

Starting from the fundamental pillars of the project, represented by the identified opportunities, it was realized, as often happens in the design process, that the chosen path would not yield significant results. Therefore, it was decided to **retrace our steps**.

During the final weeks of this project, we had the opportunity to meet Professor Bistagnino, an architect specializing in systemic design and circular economy.¹

The meeting with the emeritus professor represented a pivotal moment for us, leading us to make the difficult decision to **revisit the systemic solutions** conceived up to that point.

Following the meeting, we delved deeper into his work "Systemic Design: Designing Productive and Environmental Sustainability," in which we found many **useful insights** for achieving our goal of building a metaphorical bridge between the border cities of San Diego and Tijuana, using craft breweries as the medium, which represent a true asset of the territory.

"A questo punto, risulta del tutto ovvio che focalizzarsi su singole parti, trascurando i legami con gli elementi circostanti, interni ed esterni al processo, sia una pratica assolutamente "non utile" e anche contraddittoria con il dinamismo dell'insieme analizzato e con la "tradizionale" efficienza dei sistemi naturali che possiamo prendere utilmente ad esempio."²

(tras. "At this point, it becomes entirely obvious that focusing on individual parts, neglecting the connections with surrounding elements, both internal and external to the process, is an absolutely 'not useful' practice and also contradictory to the dynamism of the analyzed system and the 'traditional' efficiency of natural systems that we can usefully take as an example.")

The following pages, therefore, are the result not only of the studies conducted thus far but also, and more importantly, of the **reinterpretation of these studies** in light of new reflections.

strategies

Following the analysis of the opportunities and their connections, which form the project's foundation, it is now possible to define the **project strategies** that address the specific challenges of the territory, the broader objectives of the craft brewing sector, and user accessibility and engagement. Therefore, the strategies have been **divided** and conceptualized as **actions for the territory, for the industry, and for the user**.

Among the strategies aimed at the territory are the objectives of **"Building new relationships"** **"System monitoring"** and **"Encouraging sustainable development of the region"**. These strategies aim to create a **unified and positive perception** of the region. As explained multiple times within this thesis, the first strategy-**"Building new relationships"** - intends to present the territory as a **cohesive entity through systemic design**, fostering collaborations with artists, universities, NGOs and other companies within the territory, to enhance its unique characteristics. This goal is closely related to the objective of **"Encouraging sustainable development of the region"**, which aims to **improve the image of the area** by promoting its cultural and economic ties. Lastly, system monitoring through comprehensive reporting will help track progress and ensure that the new relationships and initiatives are effectively strengthening the ties between the breweries and the surrounding **community environment**. These actions aim to promote an **inclusive and systemic development model**.

The project strategies aimed at the industry seek to **enhance the narrative capabilities** of the breweries and **stimulate their continuous improvement**, reflecting positively on the territory's well-being. **"Understanding the potential of systemic design"** focuses on assisting breweries in defining, implementing, and effectively communicating their unique aspects, highlighting corporate values and environmental and social sustainability actions through **co-design with breweries**. This would allow breweries to build a **strong and recognizable identity**, not as individual units, but as part of a system, incentivized by cooperation in the **reuse of waste**. In parallel, the strategy of **"System development"** through slow systemic design will lead to the development of technologies and methodologies that **improve the competitiveness** of the entire sector, amplifying the market vision also through the intervention of industry associations.

Finally, the project strategies aimed at the user aim to create a market of **conscious and actively engaged consumers**, capable of appreciating and supporting **small local productions**. The strategy of **"Generating an aware consumer"** aspires, in the long term, to educate through active involvement, effectively making them **"ambassadors" of responsible consumption** by reducing the distance between brewery and consumer. This objective includes engaging tactics such as using **coasters to convey messages**, **raising staff awareness** by involving them in the brewery's sustainable innovation practices to better inform consumers, and **promoting dialogue with the bartender** to provide a deeper understanding of the brewing process and the actions aimed at sustainable development of the territory.

The next chapter will delve into the new system and its project-specific characteristics, detailing how these strategies will be implemented to cultivate a vibrant, sustainable, competitive, and notably transborder craft beer ecosystem. This initiative aims to **create "the bridge"**, which represents the ultimate goal of this thesis.

actions for	strategies	through
The industry	Understanding the potential of systemic design	Facilitator
		Co-design
	Definition of corporate values	Co-design
	Increasing recognisability	Visual identity and communication campaigns
	System development	Dialogue with actors
	Emergence of new systems	Industry associations
	Waste upcycling	The system at table
The territory	Building new relationships	Systemic design
	System monitoring	Report
	Encouraging sustainable development of the region	Dialogue with stakeholders
The user	Generating conscious consumers	Coaster
		Make staff aware
		Dialogue with the beertender

2.2

designing the relationships

Stakeholders play a crucial role in the study and development of a system, serving as the fundamental pillars of the collaborative network within a region.

Research has identified the stakeholders of the current system, previously outlined in the **system relationship map**. At the **core** of the system are the principal actors of the analyzed sector, the **network of breweries** in the San Diego-Tijuana region. These breweries are central to the system, as it aims to **promote regional unity** through their activities. The breweries exemplify an **excellent model of collaboration**, co-producing beers and supporting each other in sourcing raw materials.

Other key stakeholders in the current system include associations, artists, and universities. Examining the active collaborations between **breweries and associations** reveals differences between the two cities. **San Diego** shows active collaborations with **environmental, social, and industry associations**. Notable partnerships with breweries in the city of San Diego include environmental associations such as San Diego Brewcycling Collaborative, social associations within craft beer industry such as Pink Boots Society, and the industry association of San Diego Brewers Guild. In contrast, the **collaborations of Tijuana** are more **limited**, primarily **involving social associations** within the craft beer sector, such as Mujeres Brew House and social associations such as Proyecto Albo de Fundación Gaia. These collaborations mostly occur independently within each city, although some social sector associations have **promoted cross-border events** involving both cities.

Collaborations between **artists and breweries** are also noteworthy, with many breweries engaging regional artists to design their beer labels, thus promoting local art.

Collaborations between **universities and breweries** are different. Some breweries, whose employees also happen to be the professors of the course offered by UCSD to **certify brewers**,³ offer apprenticeships to outstanding students pursuing studies related to craft beer. Another example is the collaboration between California State University San Marcos, local breweries, and the San Diego Brewers Guild, which conducted **research on the economic impact** of the sector. Similarly, in Tijuana, there are collaborations involving El Colegio de la Frontera Norte, Mujeres Tijuanaenses en la Industria Cervecería, and local breweries. In this case, the collaboration involved the **discussion of various topics** dear to the different parties involved.⁴

In conclusion, the current system presents collaborations among stakeholders that provide a **solid foundation** for developing the new system. The current relationships between the actors and breweries in the region can be enhanced through new collaboration strategies. These strategies, facilitated by the educational tool for co-designing the internal brewery system, aim to achieve greater results and impacts, particularly at the environmental level.

new system actors

To develop the new system of cross-border relationships aimed at creating a metaphorical bridge between San Diego and Tijuana, **new relationships** have been established among actors of the region.

The actors within the new system come from different areas of expertise and bring **different cultural backgrounds and know-how**, contributing to innovative development through the creation of a **multidisciplinary network**. The new system aims to address the **lack of cross-border connections** by incorporating the actors who will collaborate to achieve and implement strategies for the ultimate goal. This approach will strengthen partnerships, leading to a **natural evolution** in the objectives of these collaborations. Within this system, regional breweries will collaborate with **different stakeholders** to implement the previously outlined strategies. The **focus** will **shift** from encompassing all regional breweries to a specific collaboration between the **newly established association**, which will advocate for system creation, and the **team of a single brewery**. This association will facilitate the development of **territorial connections** essential for establishing the system, achieving circular production processes, and fostering sustainable environmental and social development.

Initially, the actors involved by the association in developing tools for learning systemic design will be identified as **potential facilitators** during the workshop sessions. Among the actors that are on the regional territory are the **San Diego Brewcycling Collaborative**, who possess relevant **knowledge and a strong interest** in the sustainable development of the craft beer sector. These **volunteers** have the education, cultural background, and willingness to serve as facilitators, aligning with the strategy "Understanding the Potential of Systemic Design." To optimally develop the aforementioned strategy, a **systemic designer** will be integrated into the association. This designer will be responsible for **developing the abstract system**, conducting research, and analyzing data related to the territory, sector, and brewery interests. Additionally, they will oversee the construction of the actual system, **refining the outputs** from the co-design process undertaken during the workshop sessions. During the workshop phases, which will be detailed subsequently, breweries will clearly define their corporate values, thereby articulating this strategy.

The primary actor in this process, alongside the brewery team, will be the **facilitator**, who will assist the breweries in **identifying their corporate values**. To communicate these corporate values and the relevance of system creation to the public and other regional breweries, the identified actors for "Increasing Recognizability" will be **local communication agencies** and the brewery.

The implementation of the strategies "System Development" and "Building New Relationships" necessitates identifying key **local actors** recognized by the brewery. These actors, while **not specified** due to the absence of tailored systems for each brewery, can be found among **local small craft businesses** that compose the **industrial network** of the region. Actors forming the system are also fundamental to the development of the "**System at Table**" strategy, which involves providing users with **products and byproducts of the system** to raise environmental awareness.

Industry associations, such as the **San Diego Brewers Guild**, are critical for the "Emergence of New Systems" strategy, **encouraging** other breweries to join the workshop and become more sustainable. This association is identified as they currently offer lectures and forums that promote innovation within the sector. Additionally, it is essential to **involve** the **sector association of Tijuana**, known as the Asociación de Cerveceros Artesanales de Tijuana, which is currently inactive.

For the "System Monitoring" strategy, essential for understanding the environmental impacts of the created system on the territory, **universities** have been identified as they offer **consultancy programs** that breweries can utilize to achieve environmental and social recognition.

To "Encourage Sustainable Development of the Region," **associations** within the **environmental, social, and artistic sectors** will be engaged, creating a synergy that promotes sustainable development rooted in local culture.

Finally, the "Generating Conscious Consumers" strategy involves raising **user awareness** through dialogues in breweries sparked by coasters, the "System at Table," and the systemic tour. The stakeholders in **artisanal businesses, the brewery**, and the **association** will facilitate these actions, ensuring their successful implementation.

Overall, these new relationships will create an **environment conducive to open innovation**, allowing breweries to implement internal sustainability strategies, in addition to the networking that results from the system. Breweries will **share knowledge** not only about beer production but also about developing sector values. Associations and breweries will establish a **common framework and goals** to grow the sector within the region. Artists will contribute to a strong visual identity for the region through different applications of their work. Additionally, all the actors will collaborate with breweries to enhance the visibility and unity of the two cities through dynamic cross-border actions, starting with renewed tourist engagement.

2.3

how

To effectively implement a new system, thorough **analysis** of **operational methodologies** is essential. This process will not only establish the groundwork for **promoting ecological** and **systemic literacy** but also holds critical importance within the **current research context**. It has been noted that introducing a systemic design project, as conventionally conceived, is impractical within the specific focus area of this thesis, centered on the San Diego-Tijuana transborder region. Therefore, the project aims to lay the foundations for a systemic framework, necessitating the adoption of **participatory educational** and **instructional approaches**. These approaches are crucial to highlight the **extensive potential** of such an initiative and, importantly, to elucidate its **practical benefits**.

practical tools

"So "Systemic Design" is a recent design field that promotes a different and more suitable approach to complex problems, trying to integrate **Systems Thinking** to **Human-Centred Design**. Facing the increasing complexity of actual systems, sometimes traditional design methods are not suitable. Therefore it is necessary to define alternative methods and methodologies that consider the **importance of connections and relations**. The Systemic Design concept refers to a wide research paths and its origins are in the General Systems Theory (Bertalanffy, 1968), in Cibernetic studies (Wiener and McCulloch, 1947), in Complexity (Prigogine, 1987), in Living Systems studies (Capra, 2014) and in the Organizational Learning Theory (Senge, 1990)." ⁵ The complexity inherent in the interplay of such diverse yet **interconnected disciplines** presents a formidable challenge even for experts in the field. Communicating these concepts to individuals outside the same academic background becomes an **intriguing endeavor**. As highlighted by Bistagnino, however, the systemic approach is deeply ingrained in human nature. Therefore, it becomes essential *"calare la sua comprensione in un'esperienza reale sfruttando la nostra capacità di imparare vedendo come le cose si realizzano: imparare vedendo."*

² (trans. "to drop its understanding into a real experience by exploiting our ability to learn by seeing how things come about: learning by seeing")



Cobb Hill Farm (n.d.).
from Cobb Hill Cohousing

An example of practical application of these principles in real life comes from the **Donella Meadows Institute**. Founded in 1996, the institute translates into practical terms the thinking of environmental movement pioneer Donella Meadows, co-author of the book "The Limits to Growth" (1972), fostering a **local community** where individuals **live and learn together**, sharing resources and embracing sustainable practices. This initiative led to the establishment of **Cobb Hill Farm**, an intentional community in Hartland, Vermont, modeled after an ecovillage or cohousing. This community serves both as a **living laboratory** and an **educational center**, promoting sustainable living practices and systemic thinking. ⁵



Summer Xskool (2014).
from Konstfack University of Arts, Craft and Design

Another opportunity for systemic approach education comes from the workshop model, such as the **"Summer Xskool,"** organized by design theorist **John Thackara** in collaboration with **Konstfack- University College** of Arts, Craft and Design in Stockholm. This **week-long workshop** brings together international students and professors who collaborate to design innovative solutions for local contexts. Held on Grinda Island, the workshops delve into holistic analyses of transportation, food systems, water, and waste management. Participants **work together** to develop sustainable solutions, transforming local activities like organic markets into **learning centers**. ⁵



CLabTO (2018).
from C.lab Torino

Furthermore, within this discussion, it is crucial to mention the experiences of **"c.lab"** due to their intrinsic **multidisciplinarity**. The Contamination Labs are spread throughout Italy, and in the case of Turin, they take the form of "progetto interateneo del Politecnico di Torino e dell'Università di Torino che coinvolge più di 100.000 studenti in percorsi formativi per la generazione e maturazione di idee innovative." ⁶ (trans. "an inter-university project of the Politecnico di Torino and the University of Turin that involves more than 100,000 students in training courses for the generation and maturation of innovative ideas.") While not always focusing on systemic issues, the **multidisciplinary approach** of these labs is particularly compelling in understanding how to engage with individuals from **different academic and life backgrounds**.



Systemic design toolkit (n.d.).
from Systemic design toolkit

Finally, it is appropriate to mention the studies by **Gordon Rowland** ⁷ In his work, Rowland emphasizes the **integration of systems thinking and design** in educational settings beyond traditional design schools. His approach includes:

- Designing courses that help students **think holistically** and act to improve workplace and global circumstances.
- Using practical, **hands-on activities** to teach systems thinking, such as examining physical designs, business simulation consultations, and role-playing.
- Encouraging the **application of systems thinking** in subsequent courses and professional work.
- Creating an environment that supports learning through **experience and collaboration**, with a focus on transforming understanding from concrete experiences to abstract thinking.
- Reflecting on teaching practices to **continually improve the course** based on student experiences and feedback.

This perspective is particularly relevant for the context under analysis, as it suggests that it may be sufficient for one individual to fully appreciate and understand systemic theory to **alter the organizational modalities** of a given environment. This conception is based on the premise that a **profound comprehension and application** of systems thinking can significantly influence and **transform organizational and operational dynamics**, even in complex and multidisciplinary settings.

At the design level, it becomes evident that **investing in the education** of an individual can equip them to address the intricate problems of the analyzed context and resolve them through relationships and the involvement of other stakeholders. To quote Professor Bistagnino:

“**Come soggetti siamo parte attiva della società, attiviamo relazioni che vitalizzano la cultura locale: queste interazioni sociali diventano così l’elemento di base per la progettazione mentre gli attributi specifici di un oggetto o di un servizio sono finalizzati a produrre scelte più consapevoli e utili. Un cambio di paradigma di questa portata non può avvenire, ovviamente, nel breve periodo, ma attraverso una lenta trasformazione che utilizzi mezzi di comunicazione più idonei e soprattutto messaggi con maggiori valenze etiche.**” ²

(trans. As subjects we are an active part of society, we activate relationships that vitalise local culture: these social interactions thus become the basic element for design while the specific attributes of an object or service are aimed at producing more conscious and useful choices. A paradigm shift of this magnitude cannot, of course, take place in the short term, but through a slow transformation using more suitable means of communication and, above all, messages with greater ethical values.)



Sapporo Beer Museum (n.d.).
from Matteoingiappone



Bruges Beer Experience (n.d.).
from Ulysses Travel



The National Brewery Museum (n.d.).
from Wisconsin Great River Road



The Guinness Archive (n.d.).
from A Global Stroll

diffuse museum

To define the project framework, various project strategies were considered, aiming to ensure active participation of all stakeholders in project **generation and reinforcing social cohesion** within the **urban fabric**. In light of the identified opportunities and outlined strategies to achieve project objectives, exploration was conducted into viable pathways.

Reflecting on the analysis of case studies and focusing on the narrative of the territory and its peculiarities, the idea of **creating a "distributed" museum** emerged as a particularly advantageous and significant solution, especially in terms of initial investment.

San Diego, long recognized as the "Capital of Craft", ⁸ and Tijuana and Baja California, known as the "Cuna de la cerveza artesanal", ⁹ enjoy **excellent reputations** within the brewing scene. However, unlike other cities worldwide, **neither currently hosts a dedicated museum** that serves as a flagship for this culture. Notable examples globally, according to Forbes, ¹⁰ are:

1. **Sapporo Beer Museum** - Sapporo, Japan ¹¹ - Likely the oldest of its kind.
2. **Bruges Beer Experience** - Bruges, Belgium ¹² - Forbes described it as "the most immersive museum" ¹⁰
3. **The National Brewery Museum** - Potosi, Wisconsin ¹³ - Considered a true "domestic shrine to beer history" ¹⁰
4. **The Guinness Archive** - Dublin, Ireland ¹⁴ - "Ireland's most visited tourist attraction". ¹⁰

Considering the cross-border region under analysis, a single museum confined within a building and not in dialogue with its surroundings may not fully align with the project's goals. Therefore, exploring the **concept of a "diffuse museum"**. A "diffuse museum" is defined as follows "All various ideas of the Diffuse Museum have in common the **aim of recomposing** in the territory **the knowledge** - historical, artistic, architectural, scientific, material - and **emphasize** the importance of **diversity and cultural specificity**. As a rule, a diffuse museum is a thematic museum that proposes itineraries that organize points of interest". ¹⁵



Museo Diffuso della Resistenza della Deportazione della Guerra dei Diritti e della Libertà
(n.d.).
from Abbonamento Musei

Such a museum could serve as a **cultural and social bridge** between the two cities, emphasizing their respective peculiarities and the inherent collaboration within the region's brewing sector.

Examples of this museum type include the **Museo Diffuso della Resistenza della Deportazione della Guerra dei Diritti e della Libertà** in Turin.¹⁶ It features "un percorso multimediale interattivo e da una rete di una ventina di luoghi distribuiti sul territorio urbano che raccontano ognuno un capitolo della storia della Resistenza, della deportazione, della guerra, dei diritti e della libertà nella Torino fra il 1938 e il 1948."¹⁷ (trans. "an interactive multimedia path and by a network of some 20 places distributed throughout the city that each tell a chapter of the history of Resistance, deportation, war, rights and freedom in Turin between 1938 and 1948.")

Implementing a distributed museum in the San Diego-Tijuana region would not only **enrich cultural exchange** but also **promote sustainable tourism** and **community engagement**, thereby fulfilling the overarching goal of this thesis project.



2.4

designing the learning process

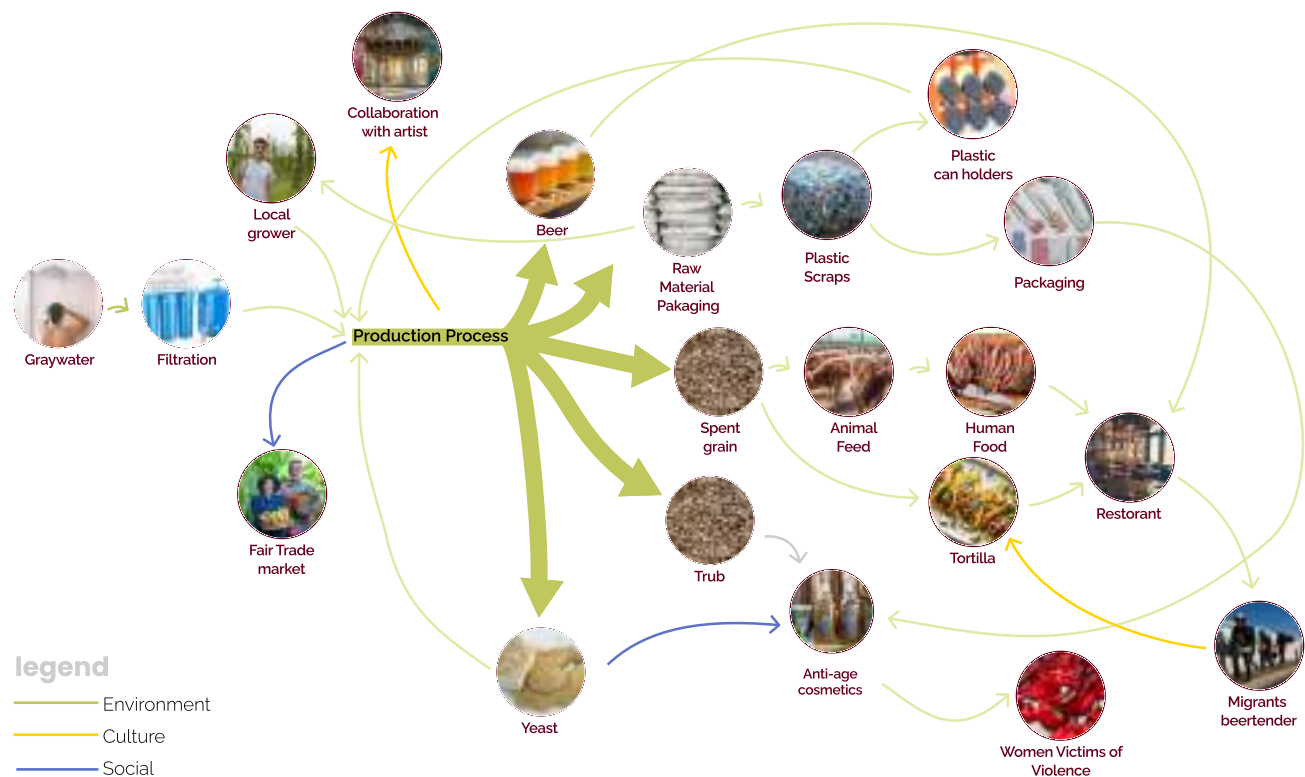
To effectively connect the systemic tools presented in the previous chapter with the education of systems thinking, the **proposed method** for achieving the stated objective involves **conducting workshops within the breweries**. These workshops will provide **hands-on experience** for the staff, **actively involving them** in the transformation of the breweries' production processes. This integrated and participatory approach is instrumental not only in structuring the new system but also in **engaging everyone in the process**, generating a cascading change that educates and communicates the value of systems thinking.

The workshop design involves **structuring** it into **several steps**:

Step 1 This phase builds upon the **holistic analysis** conducted within this thesis, which will be further **enriched and integrated** with new elements. As repeatedly emphasized, this analysis serves not as a final destination but as a **starting point**.

Activity:

1. **Refinement of the holistic analysis** through the addition of new data and perspectives. This process will help **identify more deeply the challenges and opportunities** within the craft breweries sector of San Diego and Tijuana.
2. Simultaneously, studying the **method of data restitution** derived from the holistic analysis to **facilitate dialogue** with other system actors. While this thesis does not explore various data restitution possibilities, it aims to **propose ideas** that can **support further investigations**, such as tables, games, cards, conceptual maps, among others.
3. **Establishment of a new association** dedicated to **promoting systemic methodology** among the craft breweries in the region. This association will be crucial in consolidating **support and interest in systemic innovation** within the sector.
4. Introduction of a short **training course for facilitators** essential to preparing them to successfully lead the workshop. This course focuses on **applying systemic methodology** within the context of craft breweries, providing educators with a comprehensive understanding of simulated systems presented in the thesis.



Step 2 This phase focuses on **participatory design** and the **launch of the association** dedicated to systemic methodology in the craft breweries of San Diego and Tijuana.

Activity:

1. **Networking activities** aimed at **integrating into the landscape** of existing associations in the region.
2. **Building relationships** with the aim of **establishing a solid support network** that fosters the **adoption and implementation** of systemic methodology.
3. **Launching a promotional campaign** aimed at not only **informing** but also **educating industry stakeholders** about innovative systemic approaches that can enhance business management and promote sustainable regional development.

Step 3

During this phase, the **workshop's commencement is planned, structured** into several operational stages. These stages involve the facilitator guiding the project group to prevent conflicts.

The workshop aims to construct an initial embryonic system to **generate sense-making** and is structured as follows:

Day 1 (7 hours)

1. **Understanding** (1 hour): **Explanation of the steps** to be executed and **icebreaking activities**. Welcome, introduction to the workshop, overview of the agenda, and icebreaking exercises to build rapport among participants.
2. **Defining** (2 hours): Facilitated **discussion and exercises** to identify company goals, target clients, current weaknesses, and available resources. Conducting a self-analysis of the company to identify a systemic project brief: where do we want to go? which clients do we want to acquire? what are the current weaknesses? what resources are available?
3. **Questioning** (1 hour): Identification of **impediments, brainstorming session** to list and discuss current obstacles and **challenges** faced by the company.
4. **Voting** (30 minutes): Participants vote on the most **critical questions and challenges** to focus on during the workshop.
5. **Inspiring** (1 hour and 30 minutes): Presentation of **systemic strategies and case studies** to inspire participants and demonstrate potential solutions.
6. **Proposing** (1 hour): Participants anonymously **submit their ideas and opportunities** for systemic improvements, through the methodology of "what if..?".

Understanding



Defining

Questioning



Voting



Inspiring



Proposing

Day 2 (5 hours)

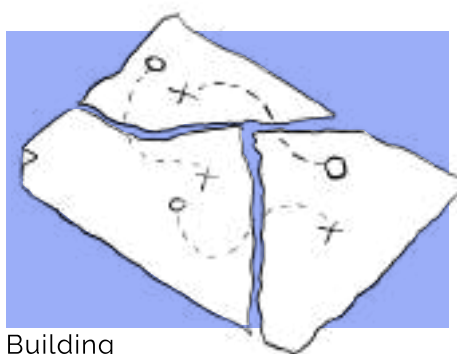
1. **Mapping** (2 hours): : The facilitator with the help of the project group maps out all the proposed opportunities, ensuring that **each idea is given equal consideration**.
2. **Building** (1 hour): Participants vote on different opportunities, resulting in a visual **heatmap of the most promising ideas**.
3. **Converging** (2 hours): Facilitated discussion and debate to **merge the most viable opportunities** into a cohesive system, culminating in a unified project plan, **a single system**.

Day 3 (5 hours)

1. **Reflecting** (2 hours): Group work to **outline specific strategies** and action plans for implementing the **newly designed system**.
2. **Evaluating** (1 hour and 30 minutes): Evaluation session to assess the **feasibility and potential impacts** of the proposed strategies across different time frames. Critically analyzing strategies feasible in the short, medium, and long term and studying their impacts.
3. **Identifying** (1 hour and 30 minutes): Identification and discussion of **key stakeholders and system actors** necessary for the successful implementation and sustainability of the new system.



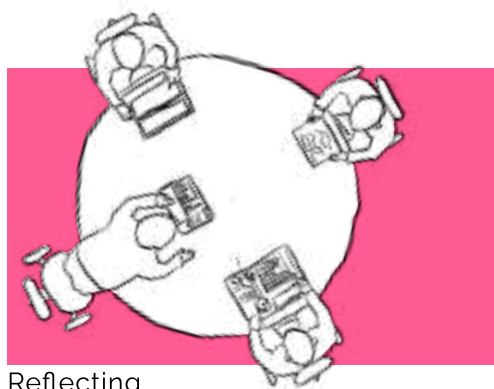
Mapping



Building



Converging



Reflecting



Evaluating



Identifying

- Step 4** | In this phase, under the guidance of a **systemic designer**, the actual **system generation** will proceed. This includes **integrating the various actors** identified in the previous phase, clearly **establishing the system's input and output flows**.
- The ultimate goal of this phase will be to **transition from a linear production model to a circular one**, promoting efficiency and sustainability across the entire production process.
- Step 5** | Multiple courses within the universities of San Diego and Tijuana are dedicated to training various stakeholders in the craft breweries system, and many researchers devote their time to studying and analyzing this phenomenon.
- This phase involves **researchers and students monitoring the system's progress** and the systems that will be generated.
- Step 6** | As the final step, the **communication** of what has been created **to the end user** is planned through the **implementation of the Diffuse Museum**. This phase will be analyzed in more depth in the following chapters.



The seeds of the project (April 11, 2024).
made by the authors

2.5

a service

The association mentioned earlier will also serve as a **communication hub** for the breweries participating in the workshops, thereby enhancing educational outcomes for users.

This association, distinguished by its **robust cross-border nature**, is pivotal in **facilitating dialogue** among diverse stakeholders and **promoting the brewing culture** throughout the region. It collaborates closely with breweries to **convey their values, histories, sustainable practices, and regional connections**. By involving breweries in workshops, it also aims to **educate and engage** these **different audiences**. This approach ensures that users gain insights into **sustainable practices**, deepen their understanding of the brewing industry's **local impact**, and appreciate cultural connections within the region.

The fundamental role of the association in its **relationship with the end user**, will be to coordinate and manage the diffuse museum, organizing itineraries and identifying points of interest throughout the territory. It will also **guide users** on how to fully experience the region's brewing landscape, ensuring that every activity aligns with the **project's cultural, educational, and environmental objectives**. In this context, future scenarios might include partnerships with **artists and universities** for the implementation of sustainable development projects or organizing events and activities within the breweries.

Regarding the target audience for the project, it is evident that there are two main types of stakeholders: **breweries and end-users**, with occasional involvement from **NGOs, artists, and universities**. The breweries are central to the project, serving as primary producers and key figures in the **cross-border cultural and historical context** of the **diffuse museum**. Their systemic investigation and structuring were detailed in the previous chapter. Consequently, the association will collaborate closely with them to communicate their values, history, sustainable practices, and connections to the region.

Furthermore, the **end-users** can be **categorized** into three distinct groups: **conscious consumers, tourists, and the local population** who frequently visit the breweries. These categories are not mutually exclusive, as individuals may belong to multiple groups simultaneously.

The **local population** who regularly visit the breweries provides a **foundational base** for the project, fostering a **sense of continuity and openness to dialogue**, as well as offering crucial support to the association's initiatives. **Conscious consumers** are those individuals interested in **supporting local productions and actively participating** in the cultural life of the region. **Tourists**, both national and international, are a fundamental resource for the project as they can help **promote the region** beyond local boundaries.

The **association** will be responsible for **creating engaging and educational experiences** for all these groups. To better understand the needs of these target categories, two Journey Maps have been developed—one for each category of target audience. These maps are instrumental in identifying touchpoints, expectations, and specific needs of each group, ensuring a personalized and effective approach to enhancing their experience.

user journey

"Un viaggio alla scoperta dei micro birrifici presenti sul territorio regionale e la degustazione dei piatti preparati con materie prime derivanti dallo stesso sistema di produzione è una proposta concreta per scoprire una realtà produttiva relativamente giovane nella nostra regione ma che può diventare motore trainante per un nuovo modello di produzione sostenibile e di cultura del cibo." ²

(trans."A journey to discover the micro breweries in the region and the tasting of dishes prepared with raw materials derived from the same production system is a concrete proposal to discover a production reality that is relatively young in our region but that can become a driving force for a new model of sustainable production and food culture")

The user journey map analyzes the **path of a "typical" user**, divided into five main stages: **Discover**, **Engage**, **Design**, **Dialogue**, and **Build**.

It is assumed that the user may learn about the experience through **various channels**. The first channel could be **word of mouth**, especially if the user frequently visits breweries or has a strong passion for the field. The second channel **involves the breweries** themselves, where a user might encounter someone participating in the experience or engage directly with the bartender about new brewery offerings. Finally, for tourists, **online channels** have been hypothesized, directing them to the experience through targeted searches.

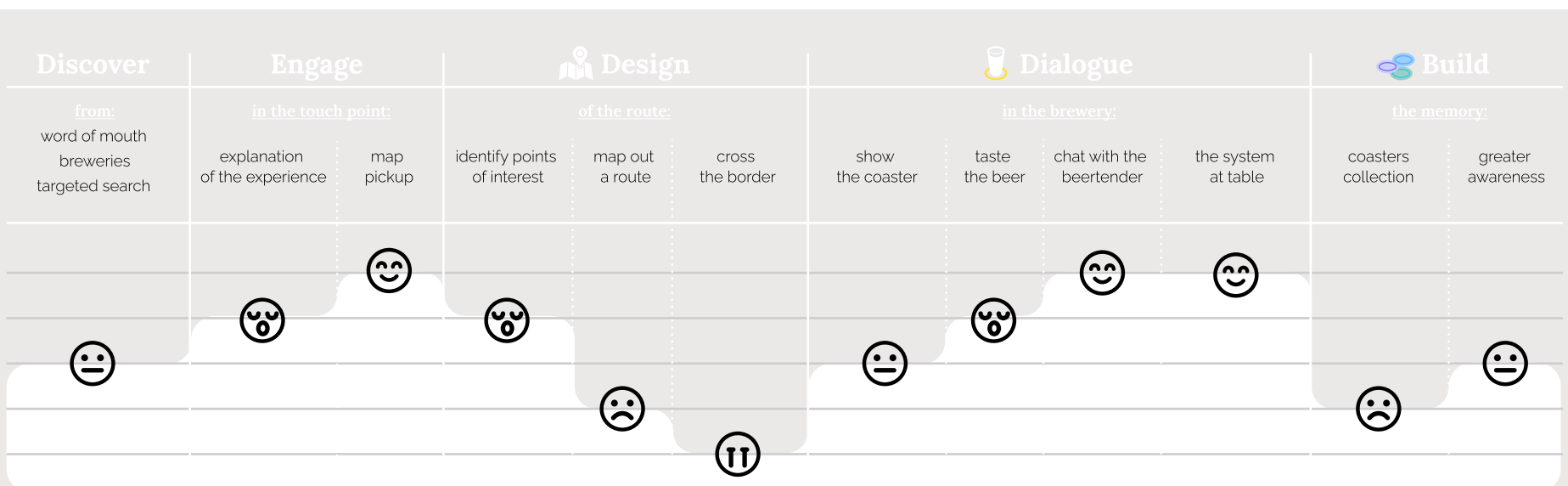
During the Engage phase, the user will **visit one of the two physical touch points** to receive a detailed explanation and collect a **"starter kit"**, which includes a map of the participating breweries. In this phase, the user's **enthusiasm is likely to increase**, as they are gratified by the physical supports provided.

The Design phase consists of several steps, the first being the **identification of points of interest** based on the categorization present in the map. The second step is the **planning of a route**, which, along with crossing the border wall, are phases where the **user's enthusiasm may significantly decrease**.

During the Dialogue phase, there is an **improvement in the user's emotions**. At this stage, the user arrives at a brewery and **indicates their participation** in the experience, which allows them to engage in a **direct dialogue with the bartender**. After tasting the beer, the bartender will explain the company's values and its connections with the territory. Finally, the user may choose to participate in the "System at Table" experience, which involves tasting products created from repurposed system waste.

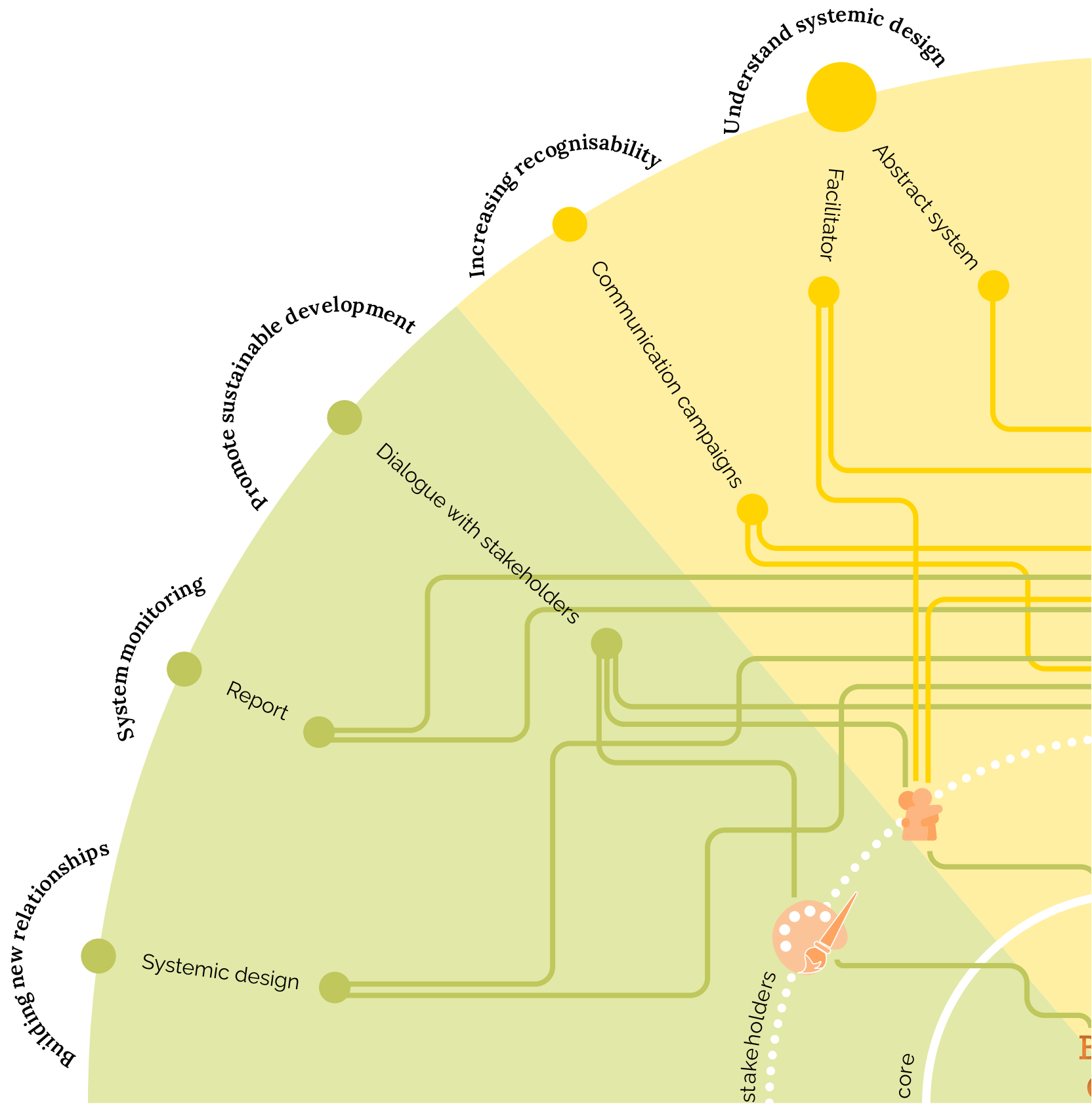
Lastly, in the Build phase, the user is **invited to pick up a new coaster** as a keepsake, allowing them to **take a piece of the experience home**. *"Se invece si educa il consumatore a essere soggetto responsabile e a manifestare una consapevolezza ecologica, proprio nella sua scelta di acquisto, il Punto di Vendita può diventare luogo di formazione e consolidamento di una responsabilità e sensibilità sociale ai temi dell'ambiente per tutta la società. Questo è il motivo per il quale riteniamo che il Punto di Vendita possa essere centro di diffusione di cultura ecologica e di nuovi comportamenti."*² (trans. 'If, on the other hand, consumers are educated to be responsible subjects and to manifest ecological awareness, precisely in their purchasing choice, the Point of Sale can become a place of formation and consolidation of social responsibility and sensitivity to environmental issues for all of society. This is why we believe that the Point of Sale can be a center for spreading ecological culture and new behaviors.')

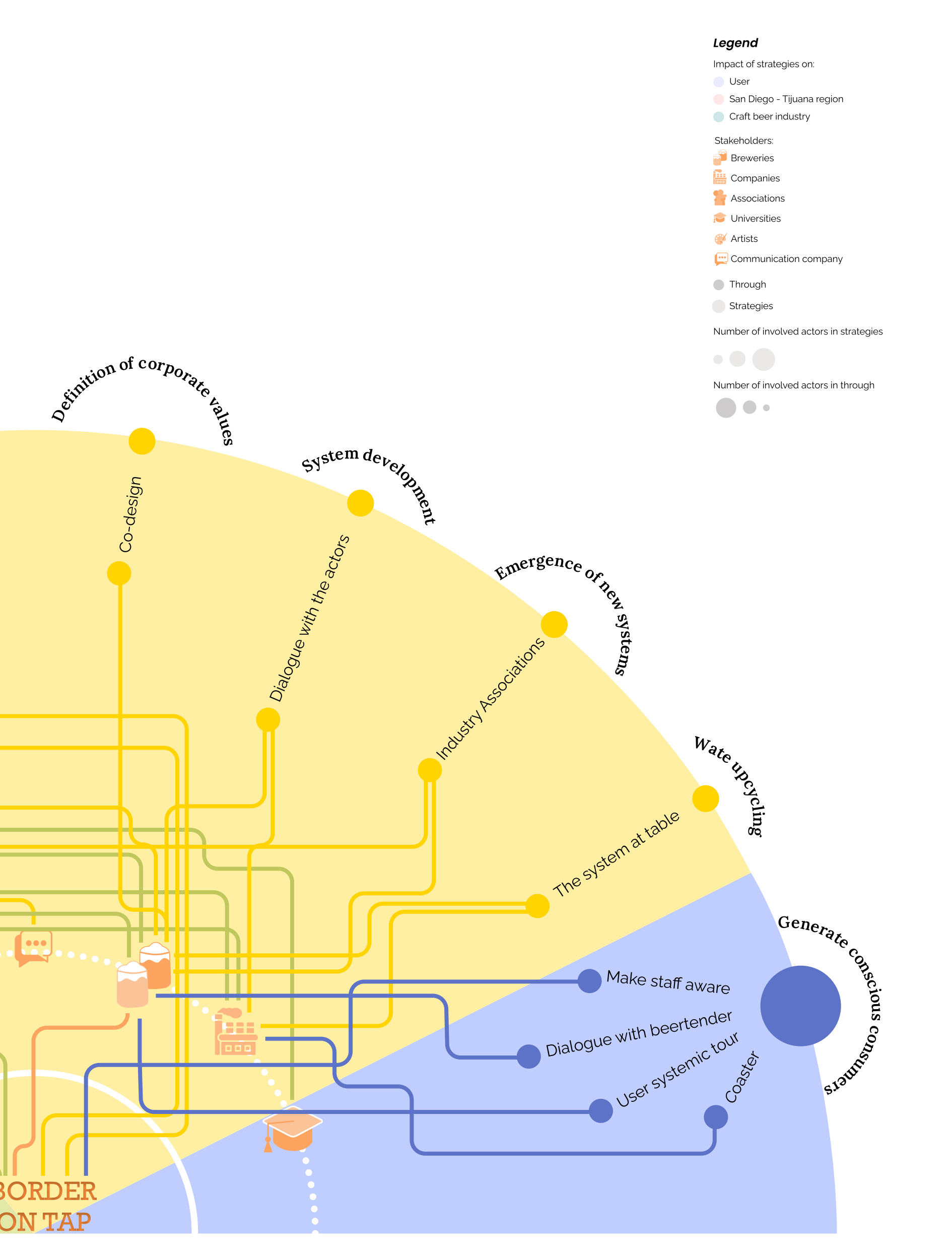
This **tangible reminder** helps the user **become more aware** of their choices and provides an opportunity to reflect on the experience, ultimately benefiting their daily life.



Systemic map

new connections





2.6

the outputs

To initiate the project, it was deemed necessary to study and analyze some crucial aspects, envisioning a few of the potential outputs. However, it is important to clarify that within the scope of this thesis, it was **not feasible** to successfully design **all the outputs** envisioned for the system. This **limitation** is due both to **time constraints** and the **inherent complexity of the project**, which would require **additional site visits** to the San Diego and Tijuana regions. Consequently, the focus has been on outputs that are immediately designable, evaluable, and have the greatest initial impact.

The first of these realizations is the experience **starter kit**, which includes a **glass, map, and coaster**, all enclosed in a classic **tasting bag**. The map will serve as a tool for the user to **keep track** of all the breweries they can visit, acting as a tangible guide in exploring the territory. The coasters, on the other hand, will serve a dual purpose: on one side, they will help the user be **recognized by the staff**, thus initiating the narrative; on the other, they will also represent the **closing element of the experience**, serving as a memento that the user can take home.

In the future, once several breweries have joined the project and established new relationships leading to the development of a waste reduction system, it will be possible to utilize **new food products** derived from brewery waste and other system actors to create a menu called "**The System at Table**".

The experience design envisions users moving between different breweries, creating a **distributed menu**. At each brewery, users will not only taste the beer but, more importantly, **sample products made from waste valorisation**. Breweries will specialize in various courses: some will offer appetizers and snacks, others main courses, some will serve pizza, and others tacos.

This approach not only **promotes sustainability and waste reduction** but also **enriches the gastronomic experience** of visitors, providing them with a unique and varied culinary journey based on brewery collaboration and innovative resource use.

In conclusion, these initial outputs will form the foundation upon which the project will be built and evolved. They represent a preliminary area for evaluation and will lead to the generation of essential guidelines for the design of other elements within the broader, more integrated system over time.





Enviroment	 Hex: #E1E7A5 RGB: 225-231-165	 Hex: #BEC65D RGB: 190-198-93
Social Wellbeing	 Hex: #EFB84C RGB: 239-184-76	 Hex: #ED9D02 RGB: 237-157-2
Civic Involvement	 Hex: #BFCDFE RGB: 191-205-255	 Hex: #5D73C6 RGB: 93-115-198
Culture	 Hex: #FFEFA1 RGB: 255-239-161	 Hex: #FFD300 RGB: 255-211-0
Pet Friendly	 Hex: #FFCCCC RGB: 255-204-204	 Hex: #FF9D9D RGB: 255-157-157

speaking through

To establish the association as a recognizable brand, several key elements have been carefully selected. Firstly, the project name **"Border on Tap"** was chosen for its symbolic and multifaceted meanings. **"Border"** emphasizes the **primary aim of bridging the border cities** of San Diego and Tijuana, creating a symbolic and physical connection between the two communities. **"On Tap"** refers to **how beer is served** in craft breweries, symbolizing the central element of the project that **facilitates dialogue and offers a unique experience** compared to those currently available in the region. Additionally, **"On"** suggests two important concepts: it evokes the **image of a device being turned on**, symbolizing the **energy and vitality of the breweries**; and it alludes to the **idea of a journey** with the expression "on the road," inviting people to explore and discover new experiences beyond the border.

The wordplay in the naming encapsulates the project's mission perfectly: **"Explore, Taste, Dialogue."** To make this explicit, the name is often accompanied by these three words, written in **both English and Spanish**, reflecting the bilingual and bicultural character of the border. This underscores the idea of an inclusive experience accessible to both language communities, promoting cultural integration and mutual understanding.

To make the design choices more consistent, a **tone of voice** was also defined, which is configured to be both **lively, welcoming and informative** reflecting the goal of creating a community united by a passion for craft beer that can transcend state borders.

In identifying the distinctive elements of each brewery, a process of categorization and simplification was undertaken to organize them into specific and easily **recognizable categories**. The selected categories include **Environment, Social Wellbeing, Civic Involvement, Culture, and Pet Friendly**. Each category is assigned a **representative color**, creating a varied color palette from pastel tones to brighter colors, allowing flexibility in the design of various project materials.

Regarding the choice of **typographic fonts**, two distinctive fonts were selected to ensure coherence and readability in the overall project design. The first is **"Rockwell,"** a geometric slab serif developed by the renowned **Monotype Foundry** in 1934, chosen for titles due to its ability to blend playfulness with geometric seriousness. The second font, **"Futura"** was chosen for longer texts for its **readability**, inspired by the art the art schools of **De Stijl, Soviet Constructivism and Bauhaus**, and is based on a well-defined geometric layout. Combining these fonts aims to ensure optimal **visual clarity and readability** in both printed and digital materials, ensuring a pleasant user experience that remains engaging and accessible.

to begin

The first interactive tool for users is the “**BREWmap**,” which serves as a **promotional and navigational aid** for discovering craft breweries in the San Diego and Tijuana region. This map aligns with the aforementioned design guidelines, thanks to its colorful and intuitive design. Special attention was given during the **design phase to the gesture** that allows for its use, making the experience pleasantly meaningful for the user. The map is structured into five sections that can be opened simultaneously for a comprehensive view or one at a time for detailed reading.

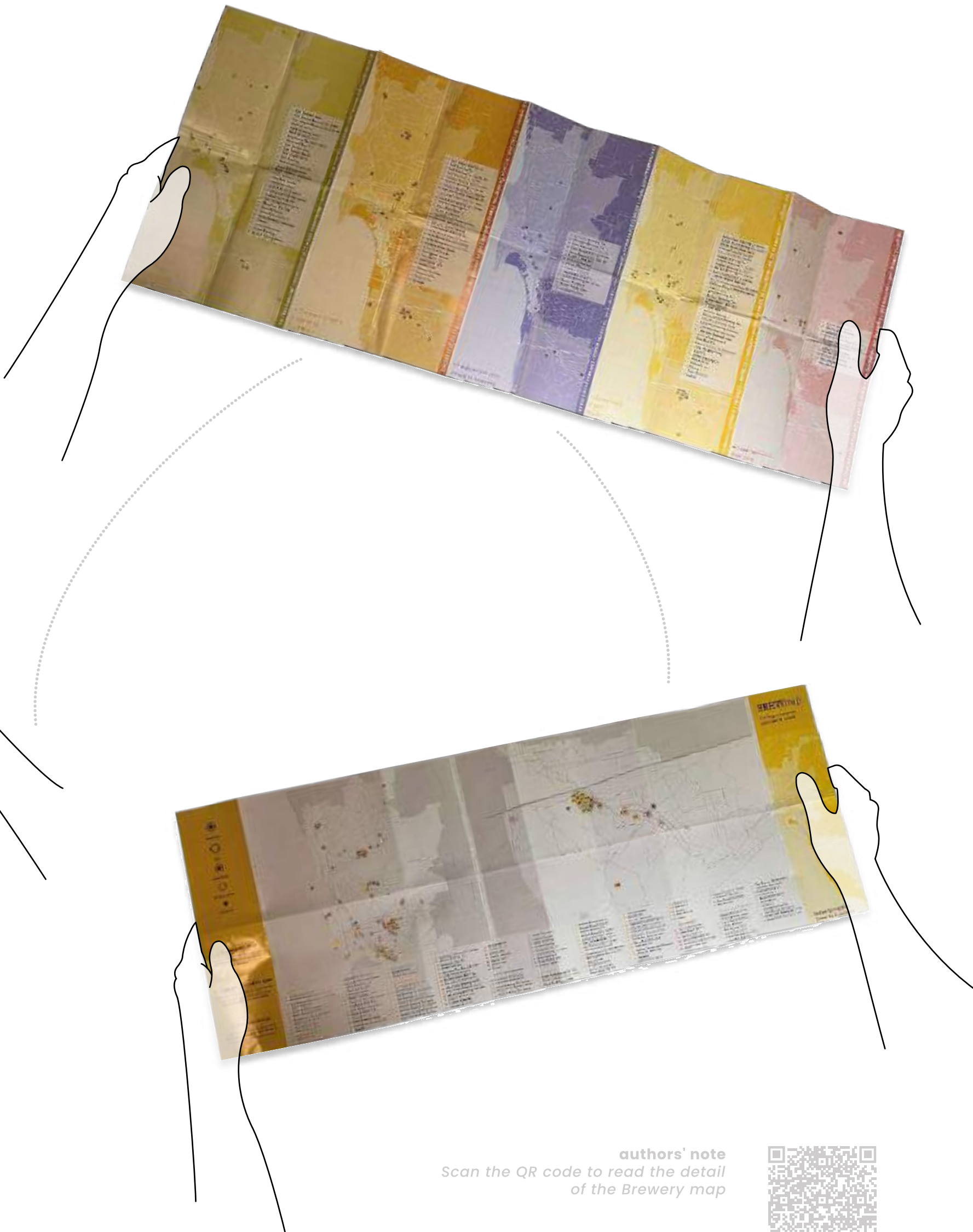
The map features a **cover** dominated by a **vibrant yellow** background that echoes the colors of the logo, while a **stylized map** of the two border cities forms the backdrop. Even when closed, the “BREWmap” displays different categories in vertical columns protruding from its left side, symbolizing the **different types of breweries** - Environment, Social Wellbeing, Civic Involvement, Culture, and Pet Friendly.

When closed, the back of the map still presents a vibrant yellow column containing **circular symbols** that **distinguish various types** of beer consumption **venues** and experiences, such as BrewPub, Pub, BrewTaste, Tasting Room, and Brewery, each characterized by specific iconography. The lower part of the map serves as a reminder of how to use it, with steps: **Browse the Map, Explore-Taste-Dialogue, Get Your Coaster**.

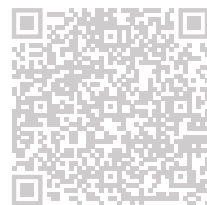
When opened, the leaflet divides into five sections on the front, each with a distinctive color corresponding to the key categories, showing a detailed map of San Diego and Tijuana with breweries listed, numbered, and identified by specific symbols.

The back of the leaflet, in contrast, offers a broader map, this time divided into San Diego and Tijuana. The detailed legend at the bottom facilitates the search and exploration, making the leaflet an indispensable companion for craft beer enthusiasts.





authors' note
Scan the QR code to read the detail
of the Brewery map



to interact

During the **"Dialogue"** phase, the user is expected to arrive at the brewery, where they must make themselves **recognizable to the bartender** using the kit, which includes a tasting bag, a glass, and a coaster.

The **interaction** with the bartender is not merely casual conversation but **rather a profound exchange** aimed at conveying the company's values, the production process, ties to the local area, and the future challenges the brewery intends to address. This explanation **helps the user grasp** the cultural and historical significance of the brewery, as well as its commitment to sustainable development in the cross-border region.

At each brewery, users will not only taste the beer but also **sample products made from brewery waste**, such as appetizers, snacks, pizza, and tacos. This not only promotes sustainability and waste reduction, enriching visitors' gastronomic experience, but also enables everyone to understand the true value of systemic thinking. As Petrini, quoted by Bistagnino, suggests: *"Nell'ambito del dialogo tra i saperi non esiste scienza più multidisciplinare di quella gastronomica, intesa come lo studio del cibo in tutti i suoi aspetti. Fondamentale è da questo punto di vista riuscire a realizzare un'operazione di recupero e rivalutazione dei saperi agricoli e gastronomici tradizionali, messi in secondo piano dalla scienza moderna e bollati come antiquati, poco produttivi o non adatti alla produzione seriale. In realtà proprio perché emersi in contesti specifici di territorio, in una dimensione locale, questi saperi e conoscenze sono un ottimo esempio di design sistemico, poiché considerano il territorio e le esigenze degli uomini che lo abitano come un tutt'uno, uomo e natura facenti parte dello stesso insieme."*² (trans. "In the context of the dialogue between knowledge, there is no science more multidisciplinary than gastronomy, understood as the study of food in all its aspects. Fundamental from this point of view is to be able to carry out an operation of recovery and revaluation of traditional agricultural and gastronomic knowledge, sidelined by modern science and branded as antiquated, unproductive or unsuitable for serial production. In reality, precisely because they have emerged in specific territorial contexts, in a local dimension, these knowledge and know-how are an excellent example of systemic design, since they consider the territory and the needs of the people who inhabit it as a whole, man and nature being part of the same whole.")

Thus, gastronomic science becomes the means through which to address a broad audience of users and **communicate the value of systemic design**. By sampling diverse culinary offerings made from what would otherwise be waste, users embark on a unique and varied culinary journey and are educated about conscious consumption.

showing off and remembering

The coaster plays a pivotal role in **enhancing the user experience** by facilitating interaction with the bartender and serving as a tangible keepsake of the overall experience. Hence, its design aligns closely with the project's guidelines.

On the front side of the coaster, the project name **"BORDER ON TAP"** is displayed in bordeaux against a vibrant yellow background. Additionally, **key words** representing the three main activities of the experience - **Explore, Taste, Dialogue** - are arranged in a circular pattern, with English on one side and Spanish on the other. **Two dots** separate the languages, **symbolizing the interconnectedness of San Diego and Tijuana** through the project's bridge, positioned at the center.

The **reverse side of the coaster**, provided at the beginning of the experience, features the **WDC 2024 logo**, symbolizing the **foundational element of the entire project**. However, this logo may be substituted to reflect special occasions and local design events such as the San Diego Design Week, SD MADE Market, Tijuana Design Week, and the Baja California Design & Craft Fair.

As for the **collectible coaster**, on its back it displays the **brewery's logo, colored in the characteristic hue of its category**, framed in bordeaux. Each visited brewery provides such a coaster, serving as a functional tool to preserve memories of each phase of the experience and reconstruct its narrative.





futuristic scenarios

To ensure the effective initiation of the project, it is essential to **develop a roadmap** that outlines the subsequent steps and ensures that all planned activities are carried out successfully for the new system.

Phase 1: Preparation and Planning

- 1. Definition of objectives and success indicators:** Refine the existing holistic analysis and integrate new data to identify more deeply the challenges and opportunities in the craft brewery sector of San Diego and Tijuana.
- 2. Market research and analysis:** Continue to enrich the holistic analysis with new elements to facilitate dialogue with other system actors.
- 3. Partnerships and collaborations:** Establish an association dedicated to promoting systemic methodology among the region's craft breweries. Start with 10 breweries, involving at least 20 initial stakeholders.
- 4. System design:** Introduce a short training course for facilitators to prepare them to successfully conduct the workshop.
- 5. Financial planning:** Design the tour route that includes visits to participating breweries, highlighting sustainable practices and the history of each brewery. Prepare informational materials and maps for tour participants.

Phase 2: Project Development

- 1. Formation of the project team:** Build relationships with the aim of establishing a solid support network that promotes the adoption of systemic methodology.
- 2. Implementation and improvement of the project:** Initiate networking activities to integrate into the existing association landscape. Establish an initial circular system where the outputs of one brewery become inputs for another.
- 3. Staff training:** Train at least three facilitators.
- 4. Development of supporting technological infrastructure:** Study methodologies for educating brewery staff on systemic thinking (e.g., boards, cards, games) to implement the workshop.

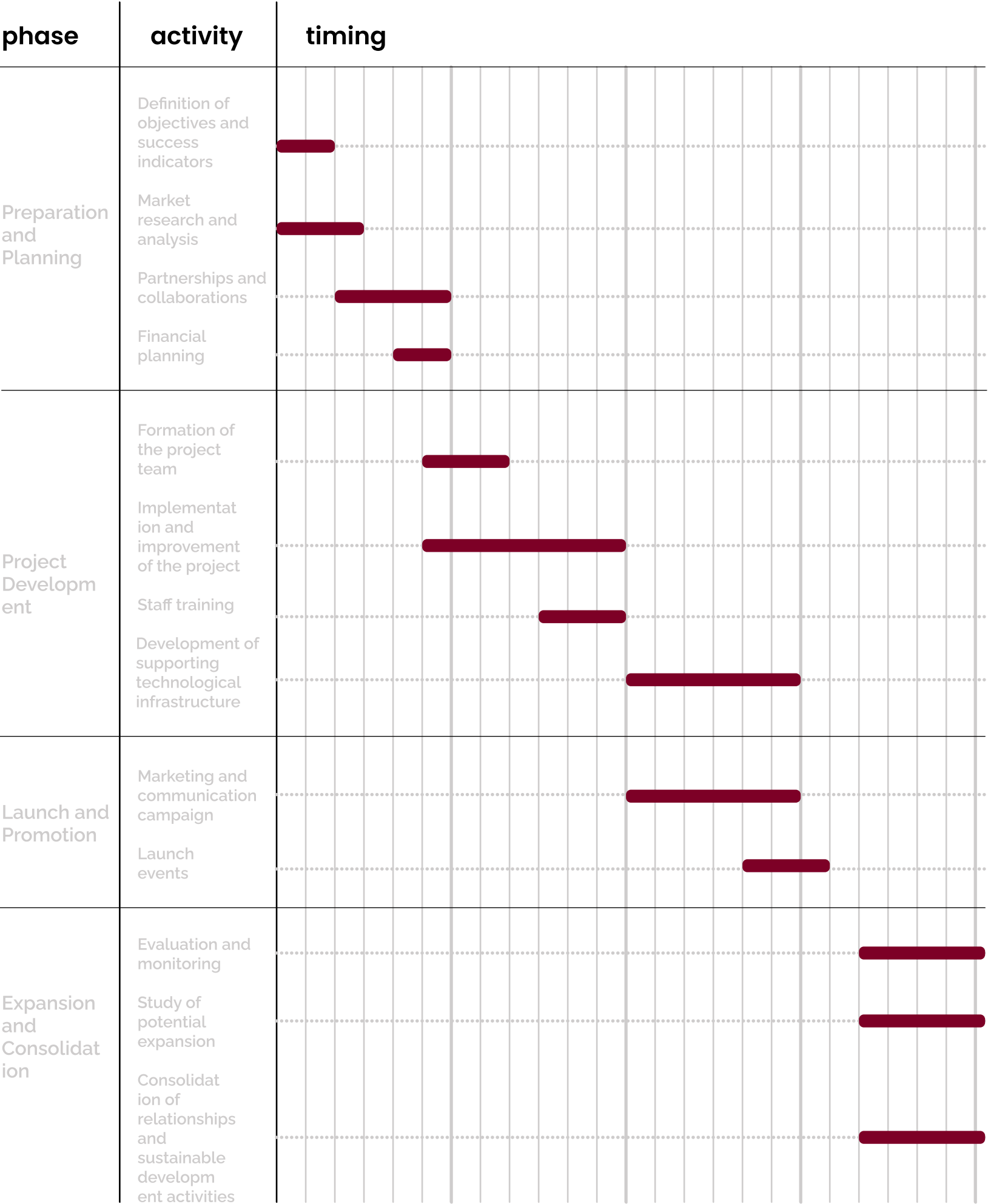
Phase 3: Launch and Promotion

- 1. Marketing and communication campaign:** Raise awareness and engage breweries and consumers, leveraging the existing network of industry associations.
- 2. Launch events:** Organize presentation events to showcase the progress and benefits of the circular system.

Phase 4: Expansion and Consolidation

- 1. Evaluation and monitoring:** Monitor the progress of the system and assess the effectiveness of the implemented strategies.
- 2. Study of potential expansion:** Collaborate with artists and universities for the implementation of sustainable development projects.
- 3. Consolidation of relationships and sustainable development activities:** Continue to train stakeholders and researchers to monitor and support the created system. Establish solid relationships that enable the generation of a menu, "The System at the Table," based on the waste products of breweries and other system actors, with an estimated time of 6 months for its complete realization.

This strategic path could ensure the long-term success of the project, represented by achieving the set objectives of collaboration, innovation, and sustainability, thereby contributing to the economic and cultural development of the region.



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the evaluation

3.1 THE CHANGE

3.2 A STARTING POINT

3.1

the change

The primary objective of this thesis is to create a metaphorical bridge between the two cities within the region. The new system promotes continuous dialogue and collaboration among various regional actors. The actors system enables the **development of strategies** that foster the implementation of collaborations within the territory. This is achieved through the **development of systems** that result in territorial unity. This metaphorical bridge symbolizes the unity of purpose and the sharing of resources and know-how within the region.

The identification of the new system, which highlights the emerging **relationships between new actors** and the evolving dynamics among existing ones, **enhances collaborations** between the region and the craft beer industry, expanding and **strengthening the pre-existing network** of craft breweries. The development of the system aims to foster cohesion and dynamism between the craft beer sector and the region, thereby addressing their needs efficiently and innovatively.

The **evaluation of the new system** is necessary to comprehend the functioning of the new system. In this context, a qualitative assessment was conducted, analyzing in detail the **dynamics and potential outcomes** of the interactions among system actors. The evaluation involves the identification of system outcomes and assessing their **feasibility and scalability**.

The outcomes play a pivotal role in both system functionality and assessment, as they facilitate understanding of thematic areas where the impact of the new system is discernible. Additionally, they underscore aspects poised for further development.

outcomes

The outcomes arise from the analysis of strategies identified through the development of the new system. They notably influence the **three main themes** emphasized in this development: **the region**, specifically the cross-border area of San Diego - Tijuana, **the craft beer industry**, and **the consumer**. Furthermore, these outcomes have additional impacts on the environment, society, and the economy. Additionally, the feasibility timelines of the outcomes can be estimated on a **short, medium, and long-term scale**. Similarly, the impact scope of the outcomes can be assessed on a **micro, meso, and macro scale**, corresponding to the craft beer industry, the region of San Diego and Tijuana, and State of California e Baja California, respectively.

The identified outcomes and their direct impacts are detailed below.

short-micro

The **provide of new experiences** within the region stems from strategy "Generating conscious consumers". Currently, these experiences are manifested through the last step of the project outlined in the previous chapter. Looking ahead, collaborations between breweries and other local stakeholders will enable the **development of new experiences** more attuned to current trends. This outcome primarily **impacts** the thematic areas of **heritage**, as it enhances the shared cultural identity of the region, the **cross-border community** by involving its stakeholders, and the **market** by enabling craft breweries to attract a broader consumer base.

short-meso

The **increase in collaborations within the region** is the primary outcome arising from the strategies "System development", "Waste upcycling" and "Building new relationships". Through these identified strategies, it will be possible to **implement and observe** a significant rise in collaborations among the actors within the region. The **impacts** of this outcome predominantly affect **stakeholders**, who are pivotal to the success of the strategies, the **cross-border community**, as enhanced collaborations foster stronger connections within the community, and the **market**, where increased relationships create more opportunities for economic return.

The **strengthening of the identity of the region** is an outcome resulting from various strategies focused on the territory and the craft beer sector. Specifically, it stems from the strategies "Emergence of new systems" and "System monitoring". This outcome arises from the **development of internal systems** within the breweries of the region, which establish a robust network of collaborations. This process enhances and consolidates the identity of the territory, making it identifiable as a place where **artisanal industries flourish in symbiosis**. The **impact** of this outcome primarily affects the **cross-border community**, as it improves the perception of the border region by fostering a sense of unity and shared identity within the community.

The **generation of user curiosity** is primarily driven by the strategy "Generating conscious consumers". This curiosity acts as the **catalyst for users** to continuously explore new breweries in the region, cross borders while reducing inherent prejudices, and make informed decisions about their lifestyle. This outcome primarily **impacts** the thematic areas of the **cross-border community** and the **environment**, as curiosity is the emotion that motivates individuals to embrace values of environmental and social sustainability.

medium-micro

The outcome of the strategy "Understanding the Potential of Systemic Design" relates to the ability of **craft breweries to make conscious decisions**. By comprehending and implementing this methodology, breweries will recognize that it is possible to achieve the same results while positively impacting the **sustainable development** of society and the environment. This outcome has a primary **impact** on the thematic areas of the **environment** and the **market**.

medium-meso

The development of the strategies "Waste Upcycling" and "Encouraging Sustainable Development of the Region" leads to **enhanced sustainability in the craft beer industry**. By adopting **circular production processes**, companies can reduce negative environmental impacts. This outcome primarily **impact** the thematic areas of the **environment** and **stakeholders**. The establishment of this system ensures that stakeholders involved in the production process, both in terms of outputs and inputs, experience fewer negative environmental impacts.

The outcome of **reducing landfill inputs** stems from the development of strategies such as "System Development," "Emergence of New Systems," "Waste Upcycling," and "Encouraging Sustainable Development of the Region." Similar to the previously

mentioned outcome, this aims to decrease negative environmental impacts. This outcome primarily **impact** the thematic areas of the **environment** and **market**.

medium-macro

The **increased cross-border movement** of individuals, driven by a **new form of tourism**, is a direct result of strategies focused on border dynamics. Specifically, it arises from the strategies "Increasing recognisability" and "Generating conscious consumers". This outcome pertains to craft beer tourism, encouraging individuals to travel within the region and cross the border. Currently, this form of tourism attracts enthusiasts, as previously mentioned, during festivals primarily held in San Diego and Ensenada. In this context, craft beer tourists would be motivated to cross the border to sample beers from Tijuana and conversely. The **impacts** of this outcome primarily affect the **cross-border community** by increasing border dynamism. It also influences **heritage**, as individuals would be encouraged not only to visit breweries but also to engage with the local culture and cultural heritage of both cities. Lastly, it has **market** implications by encouraging spending in the region.

The outcome of **enhancing the beer culture** within the region results from the integration of the craft beer sector with the local food culture. While craft beer is already a prominent beverage in the region, new storytelling efforts through coasters and dialogue with beertenders will further embed it in the local culture, adding greater value. This outcome arises from the strategies "Definition of corporate values", "Increasing recognisability" and "Generating conscious consumers". The **impacts** of this outcome primarily affect the thematic areas of **heritage** and the **cross-border community**.

A direct outcome arising from the craft beer sector, specifically through the strategy of "Increasing recognisability", is the acquisition of a **new user base**. These new customers are attracted to the sector by **clearer communication of the values** of the breweries and enhanced engagement through experiential elements, which are significant factors in consumer attraction. This outcome primarily **impacts** the **market**, as new customers contribute to increased revenue flow.

long-micro

The **reduction of environmental and social impacts** within the craft beer sector is an outcome that arise from the strategies most closely related to the beer sector, such as "Emergence of new systems", "Waste upcycling", "Encouraging sustainable development of the region" and "Generating conscious consumers." This outcome is pivotal in the region, as it requires a shift in mindsets of people to achieve tangible environmental benefits. While some breweries already prioritize environmental actions, broader adoption is needed. Through this outcome, other breweries can also advance in this area. The **impacts** of this outcome primarily affect **environmental** concerns and **stakeholders**, as increased collaboration among them facilitates achieving this outcome.

long-meso

Through the development of all previously discussed strategies, an outcome involving the **emergence of a macro-system** becomes achievable. This arises from creating numerous small systems that foster new relationships involving an expanding number of stakeholders. This process enables the creation of a **more cohesive region**, with a particular strength found in the craft beer sector. The **impacts** of this outcome primarily concerns **stakeholders** and the **market**.

The **increase in regional wealth** arises from various strategies, many of which serve as long-term investments. While these strategies may not immediately yield material wealth for the region, they will primarily enhance values and the enhancement of local know-how. Over time, these investments are expected to generate economic returns. This outcome mainly results from the strategies "Increasing recognisability" and "Emergence of new systems". The **impact** of this outcome primarily concerns **stakeholders**, as the wealth generated, as previously mentioned, is not only economic but also includes experience and know-how of the region's actors.

long-meso

The **increased visibility of the craft beer sector** results from the strategies "Increasing recognisability". This outcome is pivotal for the craft beer industry as it establishes a stronger presence and importance within the local cultural landscape of the region. The **impacts** of this outcome primarily encompass **heritage**, as previously mentioned,

and the **market**, given its direct influence on the sector's economic dynamics.

Lastly, an essential outcome for the operation of the new system, as it would enable the expansion of the system itself with new relationships aimed primarily at enhancing environmental sustainability, is the **conscious choices made by consumers**. This outcome primarily arises from strategies such as "Definition of corporate values", "Emergence of new systems", "Waste upcycling" and "Generating conscious consumers". A conscious consumer, making deliberate choices, tends to prioritize products and services that directly contribute to environmental and social sustainability, often valuing these qualities over price considerations. For this reason, the **impacts** of this outcome mainly affect the thematic areas of **environment, cross-border community and market**.

impacts

The outcomes have impacts on the environment, society, and the economy. To determine the **specific nature of these impacts**, they have been categorized into five thematic areas previously used to clarify the nature of these outcomes.

These thematic areas are:

- **Environmental**: Understanding the impacts of the outcomes in this area are crucial for fostering innovation and improvement in the sector.
- **Stakeholders**: This area examines how the outcomes influence various actors within the system, aiming to enhance cooperation and communication, and promote a collaborative approach.
- **Cross-Border Community**: The impacts of the outcomes in this area are fundamental, as the research was conducted in a region divided by the border between two states, with unique social dynamics.
- **Heritage**: The outcomes aim to preserve the cultural heritage of the region, particularly by enhancing the craft beer culture rooted in the territory.
- **Market**: The impacts on this thematic area affect the market dynamics of the sector and, consequently, the economy of the region.

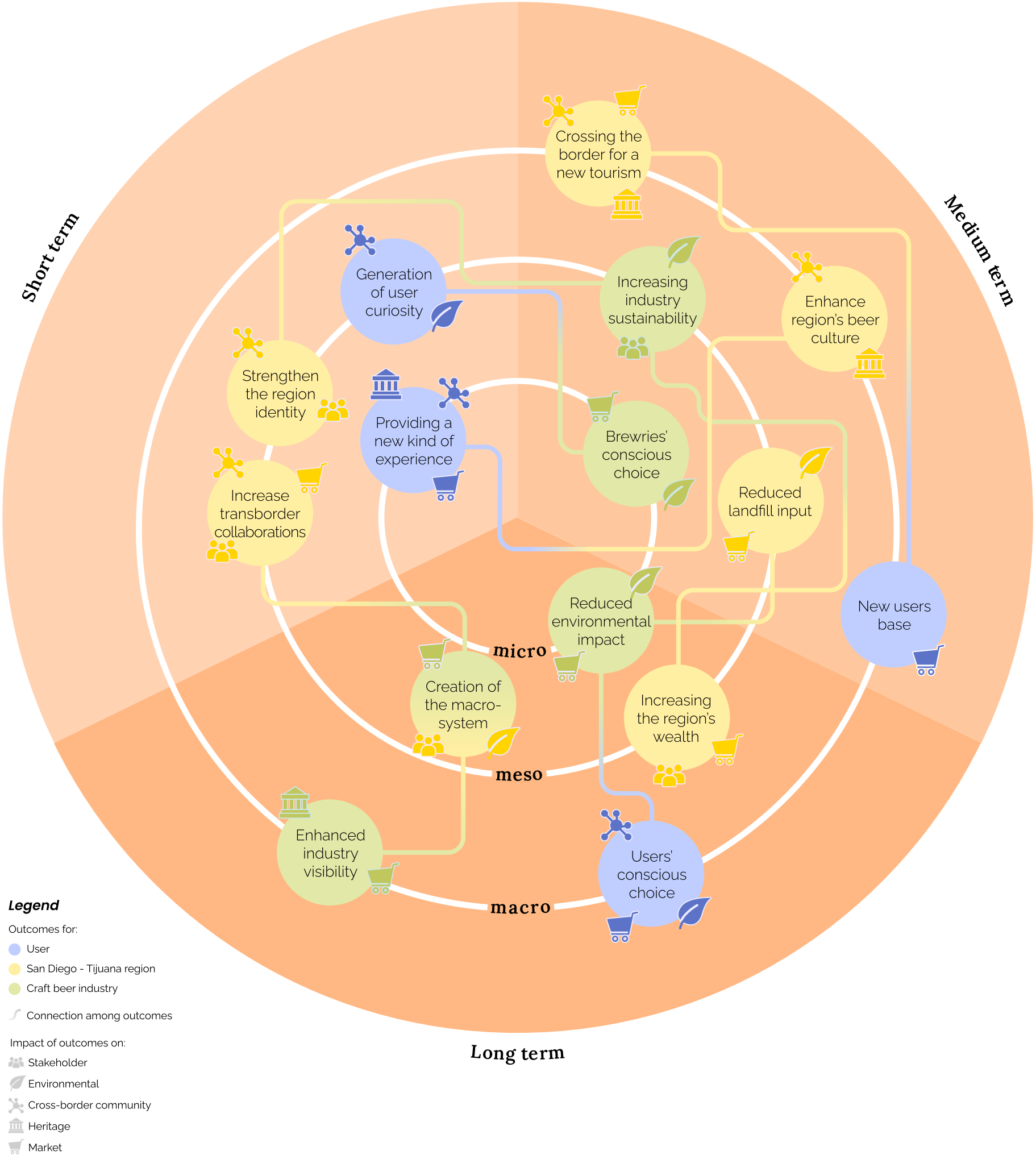
These five thematic areas are essential for the thesis project as they **summarize the initial objectives** upon which the entire study is based. By analyzing the impact of the outcomes in these areas, it is possible to obtain a comprehensive and detailed understanding of the impacts of the new system, providing a solid foundation for further **developments and improvements**.

The impacts of the previously highlighted outcomes primarily affect the **thematic areas of the cross-border community, the market, and stakeholders**. This indicates that **pursuing the main objective**, creating a metaphorical bridge between the cities of San Diego and Tijuana through systemic design methodology, guided by strategies identified from assessing opportunities arising from challenges, directly contributes to community unity by fostering relationships within the region due to the development of the macro-system.

The outcomes have **fewer impacts** within the thematic areas of the **environment and heritage**. This does not diminish their importance but suggests that future strategies could be developed to increase their influence within these thematic areas.

Evaluate the system

as it changes



links

Just as the strategies are intrinsically interconnected, the outcomes cannot be considered in isolation; their various connections must also be elucidated. By **understanding and articulating these interconnections**, the complexity and potential of systemic design can be better appreciated. This holistic perspective enables more effective planning and implementation, ensuring that strategies and outcomes align with the overarching goals of sustainable development, community unity, and economy.

The outcomes demonstrate an **initial connection through the impacts** caused from the strategies they originate from. Specifically, outcomes affecting the region, the craft beer sector, and the user are directly linked, as they are interdependent and mutually reinforcing.

Regarding the outcomes that significantly **impact the region** and are interconnected, starting from the medium term, specifically, the conscious choice made by breweries, they will directly contribute to **increasing sustainability within the sector**. These decisions will enable actions that, over the long term, lead to reduced environmental impacts, positioning the sector as a model to emulate. As a result, this will enhance the sector's national visibility.

Concerning outcomes that subsequently **affect the craft beer sector**, connections can be explicitly traced beginning with short-term achievable goals. Increased cross-border collaborations, for instance, will strengthen the region's identity. In the medium term, this will enhance the local beer culture and boost cross-border tourism. Looking ahead, more breweries are expected to adopt these tools, recognizing the project's **benefits for both industry and region**. This will facilitate the development of a macro-system that enriches the region in terms of knowledge, collaborations, and economic prosperity.

Finally, with regard to outcomes that directly **affect the user**, they are interconnected. The generation of user curiosity in the short term, combined with a new experience involving different stakeholders and perspectives, raises awareness about different issues related to craft beer production and values. This **heightened awareness**, particularly in distinguishing artisanal from industrial beer through its values on both sides of the border, empowers individuals to make conscious choices that promote environmental and social sustainability in the long term.

Furthermore, there are connections between outcomes that exhibit different types of impacts. It is important to recognize that the connections between outcomes occur over varying timelines, resulting in a sequential progression of impacts.

Examining the connections between

strengthening the region's identity, strengthening the region identity, increasing the industry sustainability and increasing the wealth of the region reveals the interconnection of the outcomes and their **temporal sequence** in short, medium and long term respectively. Strengthening the identity of the region, facilitated by improved communication of corporate values by breweries and the implementation of knowledge-sharing operations in an **open innovation context**, will enable the region to increase its wealth, both in material terms and in knowledge and values.

The curiosity of consumers, generated by breweries that enhance innovations in social, environmental, and cultural aspects through system implementation, will drive breweries to make **increasingly conscientious choices** in the medium term. This is due to these innovations being recognized and appreciated by consumers.

The creation of a new type of experience, which directly corresponds to part of the developed project, there is a clear connection to the enhancement of the craft beer culture in the region. These outcomes are closely interlinked because, in the long term, the new type of experience, along with future **experiences to be implemented**, will lead the region and its inhabitants to better appreciate this culture. This recognition will ultimately **position craft beer culture** as a notable strength within the region.

The increase in interregional collaborations facilitated by the new system, achievable in the short term, will consequently create the macro-system and then enhance the visibility of the sector in the long term. This occurs as the sector becomes **more ingrained** in the territory through these collaborations, thereby increasing its visibility through new channels over time.

The medium-term impacts of crossing the border for a new tourism and new user base are interconnected. The **motivation behind crossing the border** initiates the creation of the new user base in the breweries of the opposite city.

In conclusion, the outcome identified to emerge in the medium term, namely reduced landfill input, is closely linked to long-term reduced environmental impact and user conscious choices. This is because a decrease in landfill inputs results in reduced environmental impacts, **prompting environmentally conscious consumers** to prefer the services and products offered by these establishments.

3.2

a starting point

Once the system's outcomes, that are related to the territory, sector, and users, have been established, along with their impacts and interrelationships, it is essential to proceed to the evaluation phase.

The evaluation provides a comprehensive understanding of the system's potential and its **implications for the macro-themes** of environment, society, and economy, thereby highlighting the system's strengths.

Through this evaluation, the **economic feasibility and scalability of the system** can be determined. Economic feasibility is critical for understanding the initial investment required from companies and whether they can access tax incentives or receive support from local or national authorities. Additionally, scalability is fundamental in systemic design, as it helps **identify similar contexts** where the system can be applied, ensuring that the initial investment can generate value in diverse scenarios. Understanding scalability allows for the prediction of how the system can **adapt to various operational scales** and market conditions, thereby facilitating informed strategic decisions and increasing the likelihood of long-term success.

feasibility

The feasibility of the strategies identified through the development of the new system aims to define their **temporal and economic aspects**. In this context, temporal feasibility has been qualitatively estimated, and in the absence of a detailed economic evaluation, only a brief mention of economic feasibility will be made.

In terms of timeline, the strategies suitable for short-term implementation include "Understanding the Potential of Systemic Design," "Defining Corporate Values," "System Development," "Building New Relationships," and "System Monitoring." These strategies are interconnected through the **development of the brewery system** using the aforementioned tool.

For strategies like "Increasing Recognizability," "Emergence of New Systems," and "Waste Upcycling," longer timeframes are envisioned, specifically in the medium term. This is because these strategies **require initial investments and a shift in mindset** among stakeholders, which is expected to commence with the short-term strategies aimed at preparing stakeholders through co-designing the system.

Lastly, the strategy feasible in the long term is "Generating Conscious Consumers." This strategy involves a gradual cultural change among individuals, as sudden changes are not suitable in this context. As previously mentioned, this strategy can **only be implemented after people** have gradually embraced **environmental and social sustainability** through incentivization and the adoption of open innovation practices by companies.

Therefore, these strategies can be viewed **on a timeline** where each phase leads to the next, **promoting education among breweries and awareness among consumers through dialogue between local actors**. Research has shown that a systemic design, with tangible outcomes through the creation of the tool enabling co-design of the system and the "Border on Tap" experience, is currently absent from the region's offerings. Moreover, despite the **lack of a detailed economic evaluation**, this experience is economically advantageous for fostering a mindset of socially and environmentally conscious consumption, as it comprises low-budget solutions.

Due to the shared commitment of various countries to the sustainable development goals promoted by the 2030 agenda, numerous assistance programs have been established by different states. On both sides of the border, the issue of environmental sustainability is significant. Both the States of California and Baja California, as well as the cities in the region, offer various **programs to support companies** in investing for **sustainable change**.

The **State of California** promotes several programs, ranging from the **use of clean energy**

for companies, **building renovations** to improve energy efficiency, to the **recycling of organic waste** produced by companies.¹

The **city of San Diego** offers various strategies and incentives for companies under the **Sustainability Program**, which includes water supply, renewable energy, and wastewater monitoring, among other areas less relevant to the craft beer sector.² Additionally, the city provides tax incentives through the **New Employment Credit (NEC)** for hiring economically disadvantaged individuals and partial sales tax exemptions for companies **purchasing production and R&D equipment**.³

Similarly, **Baja California** has set goals to **enhance environmental and social sustainability**. These include the implementation of renewable energy and energy efficiency in production buildings, water resource management, and community involvement.⁴ Another goal is to promote sectors related to creativity, including gastronomy, aiming to generate business opportunities based on the protection and use of intellectual property.⁵

The **city of Tijuana**, promote, on the other side, various programs are available, such as the **Negocio Verde certification**, which requires companies, especially those with direct sales to customers, to meet certain criteria to enhance their image, receive public recognition from environmental authorities, and be listed in the electronic register of green businesses.⁶

scalability

Scalability, as previously highlighted, holds a pivotal role in systemic methodology. This principle is intrinsically linked to the **capacity to adapt** and consistently apply **organizational patterns** across diverse contexts.⁷ Scalability empowers systemic models to **remain flexible and evolve** in response to new needs or contextual changes. A pattern derived from a system implemented in one context can be effectively transferred to another, retaining its efficacy and coherence. Such adaptation requires a thorough knowledge of the **specific attributes of the new context** and the systemic dynamics at play.

The strategies explored in the development of the thesis project realised in the development of the tool that allows the co-design with breweries of their own system and of the "Border on Tap" project have arisen from a meticulous contextual analysis. This encompassed an examination of the physical barrier between the United States and Mexico, a detailed study of the San Diego - Tijuana region, direct experiential insights that deepened understanding of the region's complex challenges, and a comprehensive review of the craft beer sector chosen as a metaphorical bridge between San Diego and Tijuana. The context analysis reveals that the region has a strong cultural identity. However, **consumerism**, prevalent in highly industrialized states like the United States, is supported by the production activities of the Maquiladoras in Tijuana, leading to a decline in social and environmental sustainability values. Consequently, the identified strategies focus on educating breweries to develop a production system that **restores environmental and social values** within companies. Simultaneously, these strategies aim to offer customers a product that generates curiosity about environmental issues. In the long term, this approach aims to promote informed choices, **moving away from consumerism** toward more circular production processes and economies that are socially and environmentally sustainable.

This approach holds promise for **global scalability** within industrialized nations where there may be initial reluctance among citizens to adopt informed decision-making processes.

The devised system, centered on forging new territorial relations, demonstrates **scalability across cross-border contexts** where shared complex challenges **require collaborative solutions**. However, its applicability may encounter obstacles in transborder regions marked by **conflicting states**, depending on the willingness of involved entities to engage in constructive dialogue.

The study of a territory through holistic analysis is essential for cultural understanding and **asset identification**. This analysis must be complemented by field research to gain a deep comprehension of the territory's qualitative

aspects, thereby enabling a comprehensive and profound observation. Identifying the assets of the territory is a fundamental step for the **scalability of the considered sector**. This identification must be **shared by both sides of the cross-border region**, highlighting the potential for creating transregional relationships.

Regarding the **craft beer sector**, chosen as a metaphorical bridge, **scalability poses inherent challenges**. Cultural norms dictate varying levels of alcohol consumption worldwide, potentially limiting the sector's reach in contexts where such preferences diverge. Nonetheless, **the underlying characteristics of the sector are scalable**, as it was chosen because it is present on both sides of the barrier, and the values of the sector are **recognised**, even if minimally, **by both cultures**.

Finally, the identified **educational process** is scalable through the use of the workshop methodology described above. Once the sector and the respective actors are identified, these actors, once trained, can function as facilitators. This process includes data research phases and subsequent feedback. The systemic design methodology will then perform its role effectively. This methodology is inherently **scalable and adaptable to various contexts** by identifying the most suitable opportunities for the studied context.

The scalability of this educational process lies in its **structured approach**. Systemic design, as a methodology, excels in scalability due to its flexibility and adaptability. It allows for the integration of various elements and stakeholders, ensuring that the most appropriate opportunities are identified and leveraged. This adaptability ensures that the methodology can be applied to different sectors and contexts, making it a **powerful tool for fostering sustainable development**. By utilizing this approach, the educational process not only addresses the immediate needs of the sector but also creates a framework for continuous improvement and innovation.

In conclusion, the scalability of the identified educational process is achieved through the combination of a structured approach, the training of key actors as facilitators, thorough data research, and the inherent flexibility of the systemic design methodology. This comprehensive approach ensures that the process can be **effectively adapted and applied to various contexts**, promoting sustainable development across different sectors.



bibliography and sitography

3.2 A STARTING POINT

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a new beginning

The research phase highlighted numerous **active collaborations** between the United States and Mexico, demonstrating that the territorial context offers fertile ground for the development of the project, conducive to **cooperative strategies** typical of systemic design.

The **theme of creativity**, spurred by the designation of the two cities in the region as World Design Capital 2024, has fostered a **regional context** more **open to change**. Throughout the year of activities and events under the WDC, numerous projects aimed at improving the involved cities have been presented and realized. It is within this context that the system and the project find their place, contributing to **regional unity** and **enhancing transregional relationships**.

The implementation of the new system will promote the formation of **new relationships**, building upon those already existing in the territory. Cooperative work among stakeholders, both within and **beyond the craft beer sector**, will foster strategies aimed at achieving the initial goal: the creation of a metaphorical bridge between the cities of San Diego and Tijuana, separated by the physical barrier of the U.S.-Mexico border.

The **educational methodology** identified in this thesis, along with the **experiential presentation to users** of the sustainable developments of the systems to be generated, represents a **crucial starting point for future investigations**.

The system and the design guidelines developed have demonstrated **positive qualitative results** at both the industrial and territorial levels. These results contribute to the development of a **united cross-border territory**, enabling users and citizens to make **informed decisions**, which will serve as a foundation for achieving **environmental and social sustainability goals**. The project will be integrated into the region's environmental and economic policies, additionally promoting the growth of the craft beer sector and establishing it as a **virtuous model for the entire industry**.

As we consider the research and systemic design work **not as an end in itself**, but with the hope that it may be situated within the broader debate on borders and that **research in this direction may continue**, we intend to conclude this thesis with a **set of guidelines**, following the systemic design methodology. These guidelines are intended to assist other designers in developing systems that promote **territorial unity in border contexts**:

- **Territory of collaboration:** The territory should be **suitable for the development of cross-border collaborations**, free from political instability leading to conflicts, wars, or cultural clashes. Such instability would hinder the development of a systemic project aimed at weaving relationships beyond human-imposed borders.
- **In-depth knowledge of the territory:** A comprehensive study of the territory through **holistic analysis** is essential for **cultural understanding** and **resource identification**. This analysis should be complemented

by field research to thoroughly understand the **qualitative aspects** of the territory, enabling a complete and in-depth observation.

- **Identification of collaboration resources:** Identifying the **assets of the territory** is a crucial research step as it allows for the recognition of **sectors shared by both sides** of a cross-border region. This identification enables the recognition of potential areas from which to start creating **cross-border relationships** that can evolve into broader and more complex systems.
- **Dialogue with current system stakeholders:** During the research phase, it is essential to initiate a dialogue with current sector stakeholders to fully **understand the state** of the system. This dialogue will help **identify challenges and opportunities**, guiding the designer in recognizing potential project challenges.
- **Study of system impacts:** By understanding the current sectoral system and, if possible, identifying and studying production processes, it will be possible to develop a **quantitative analysis** of the **environmental, social, and economic impacts** of the system.
- **Problem identification:** Identifying problems involves synthesizing all territorial and sectoral research. Through the development of **identified criticalities and potentials**, it is possible to **define challenges** within already complex contexts like cross-border regions.
- **Context-appropriate solutions:** Identified solutions must **respect the local context**, considering cultural factors and different levels of territorial development. It is essential to respect the local context to ensure that the developed strategies are **coherent, adoptable by actors**, and achieve a higher number of **positive impacts**.
- **Evaluation of impacts from the new system:** Developing a new system for the territory must be accompanied by a **qualitative-quantitative evaluation** of the impacts generated on the **environment, society, and the economy**. It is crucial to ensure that these impacts are constructive for the context.
- **Future challenges:** Addressing complex problems makes it challenging to achieve immediate results. However, the challenge lies in the continuous **monitoring and adjustment of the system**. Such projects lay the groundwork for stratification strategies that will identify new future challenges to address.

In conclusion, it is hoped that the use of the systemic design methodology for project development and the outlined guidelines will be **useful for similar initiatives**. Through this contribution and the subsequent contributions it is hoped to inspire, a **sustainable and collaborative development model** could be launched, replicable in **different situations, territories, and application contexts**.

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Aline and Giulia

