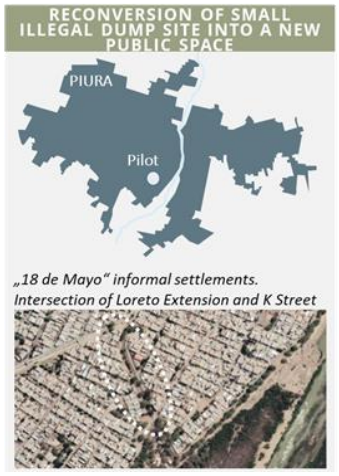
MORGENSTADT GLOBAL SMART CITIES INITIATIVE
GLOBAL APPROACH – LOCAL SOLUTIONS

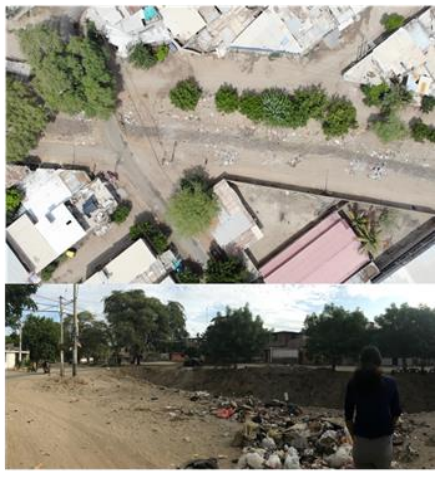
Supported by:
Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection
based on a decision of the German Bundestag

CITY LAB PIURA

Pilot Project

Conversion of a small illegal dump site into a quality public space in the city of Piura using a GIS analysis tool





About the City

Piura is a city in north-western Peru in the Sechura desert. Due to its geographic location, the city and the region are very vulnerable to adverse impacts of climate change. At the national level, Piura is one of the cities with the highest population growth, mainly with large informal and spontaneous constructions. The rapid growth leads to challenges in urban planning and resource management. Measures can't be implemented along the speed of informal spatial expansion, leading to informal settlements often lacking one or more basic services. Also, out of the 200 tons of solid waste produced by the district per day, about 25% of it is not collected. In 2021, 14 small illegal dump sites were registered by the municipality. These have become infectious hotspots that constitute a health risk for the population. Furthermore, the number of green areas in the city (1.75m^2 per inhabitant) is very low compared to the recommended minimum of 9m^2 per inhabitant.

For more info visit: https://mgi-iki.com/de/city/piura-peru/

OBJECTIVES

- Demonstration of strategic planning based on GIS and digital tools and urban analysis.
- Conversion of a small illegal dump sites into new green areas.
- Promoting citizen participation and environmental education with a co-design process of the new public space.
- Replication and scaling up the intervention in other small illegal dump sites of the city and use of digital tools for other urban development projects in the city.

CHALLENGES ADDRESSED

Heavy rains and stormwater

An increase in the city's tree cover will contribute to reducing the risk of flooding and will help to slow down the flow of rainwater to vulnerable areas near the intervention area.

Water shortages and droughts

Plantation of native species that are adapted to the climate. Protection of soil and thus conservation and permeability of water.

Risk of pluvial and fluvial floods

Plantation of trees improves soil permeability, leading to flood risk reduction.
Change in people's habits regarding waste that blocks rainwater channels.

Urban Heat Islands

Plantation of trees leads to a reduction of air and surface temperature, providing shade and cooling through evapotranspiration.

Soil Degradation

Conversion of the site decreases soil contamination due to waste removal. In the long term, it contributes to developing sustainable urban plans and strategies that address urban sprawl, another cause of land degradation.

Changes in the biological system

Replacing the small illegal dump site with native vegetation to mitigate health risks and reducing the propagation of vectors effects that spread pests (mosquitoes, flies, etc). Plantation of native plants recovers the local ecosystem.

Climate Justice

Awareness-raising and education on climate change, environmental resources, recycling, etc., building capacities and knowledge, especially to the most vulnerable population groups. GIS and digital maps increases transparency and participation.

EXPECTED IMPACTS AND BENEFITS FOR THE CITY

Environmental

- Elimination of a dump site by creating a new public green space.
- Optimization of water resources, urban soil and green coverage.
- Mitigation of future flooding events and cooling of urban heat islands.

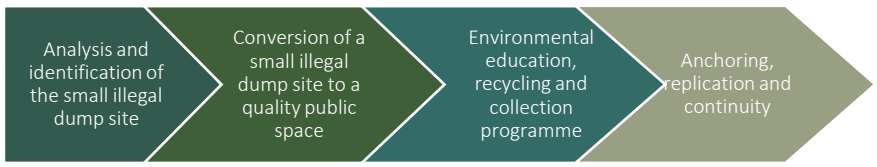
Social

- Creating a new meeting place for citizens.
- Increase transparency through maps available to the public.
- Promotion of good habits and environmental education.

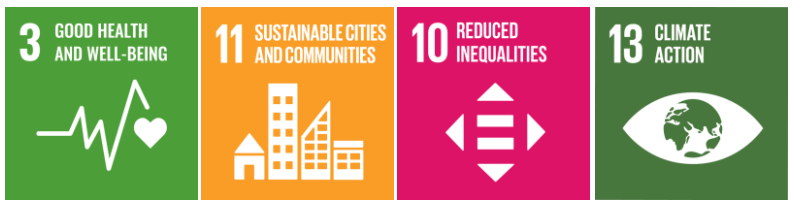
Economic

- Demonstration and analysis of urban space to select the place to implement the project, being an example of sustainable urban planning.
- Implementation of a centralized GIS data system for the municipality.

IMPLEMENTATION PHASES



CONTRIBUTION TO THE SDGs



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Universidad de Piura

Piura Municipalidad Provincial

Supported by:

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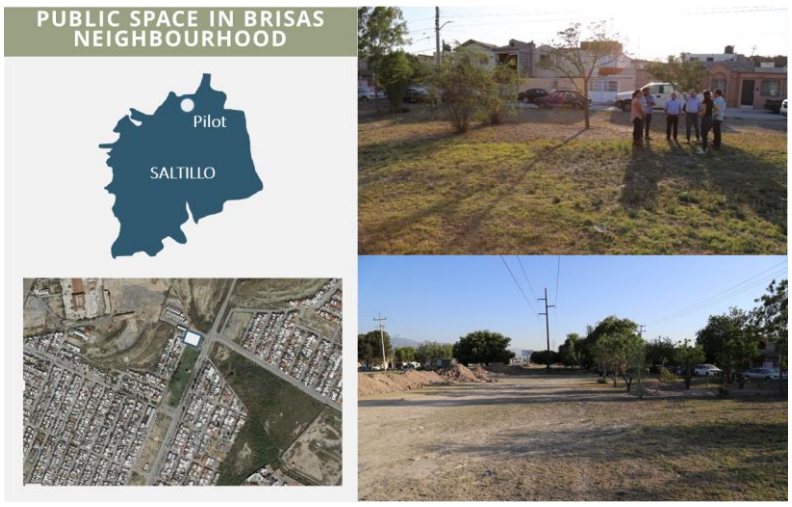
CITY LAB SALTILLO

Pilot Project

Restoration and Integration of Blue-Green Infrastructure in the urban landscape



About the City

The City of Saltillo lies in the Northeast region of Mexico in the semi-desertic area of the state of Coahuila. This location makes the city highly vulnerable to water scarcity, droughts, heat waves and heat islands in spring and summer. Still, at the same time, due to intense atmospheric phenomena and heavy storms, it suffers heavy rainfall events causing floodings during the rainy season.

Additionally, Saltillo is growing extensively as a sprawling city, with a current population of approximately one million inhabitants. This urbanization pattern with few green spaces and the lack of permeable surfaces exacerbates the increasing temperature, the urban heat islands (UHIs), and the flooding in urban spaces due to poor pluvial drainage (lack of retention, infiltration and runoff and rainwater management). It is expected that heavy rainfalls, flooding, heat waves and heat islands in Saltillo will be more frequent, with many consequences for the population.

For more info visit: https://mgi-iki.com/de/city/saltillo-mexiko/

OBJECTIVES

- Integrate Blue-Green Infrastructure (BGI) into the urban environment with the approach of Nature-Based Solutions (NBS).
- Implement some techniques of Blue-Green Infrastructure to mitigate flood risks, mainly pluvial type and improve water infiltration to the ground.
- Improve the microclimate and reduce heat islands.
- Create an accessible, safe, and comfortable space for the surrounding inhabitants.
- Carry out a small intervention with Blue-Green Infrastructure techniques as a modular approach, taking this intervention as an Urban Living Lab (ULL) to replicate these techniques in other areas of the city.

EXPECTED IMPACTS AND BENEFITS FOR THE CITY

Environmental

- Contribution to the conservation of the flora and fauna and increase of urban green spaces.
- Reduction of pollution levels and urban heat islands due to plantation of trees and other plants.
- Zero emissions by the implementation of a nature-based solution.
- Improvements in the Reduction of pluvial flooding, capturing rainwater by the infiltration process.

Social

- Strengthening the connection between the inhabitants and the neighbourhood.
- Provide a safe space for the inhabitants and increase the neighbourhood's aesthetic.
- Creation of quality public space.

Economic

- Reduction of damage to urban infrastructure due to flooding.
- Improvement of the urban image of the selected area.

CHALLENGES ADDRESSED

Heat Islands and heat waves

BGI provides cooling through shading surfaces, deflecting the radiation from the sun, and releasing moisture into the atmosphere by evaporative cooling.

Pluvial flooding

BGI mitigates flooding by detention, infiltration, and evapotranspiration of urban stormwater. They improve urban water cycle, reduce total runoff and stress on sewer systems.

Excess runoff

BGI manages stormwater through processes of infiltration, evapotranspiration, retention, detention, and slow transport, reducing the total runoff and decreasing peaks.

Soil Degradation

Creating multi-functional spaces improves the relationship between vegetation, soil and the water cycle.

Loss of biodiversity

Interventions with BGI can transform urban spaces into habitats for various species and improve biodiversity.

IMPLEMENTATION PHASES

CONTRIBUTION TO THE SDGs

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IMPLAN
INSTITUTO MUNICIPAL DE PLANEACIÓN SALTILLO

Tecnológico de Monterrey

Supported by:
Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection
based on a decision of the German Bundestag

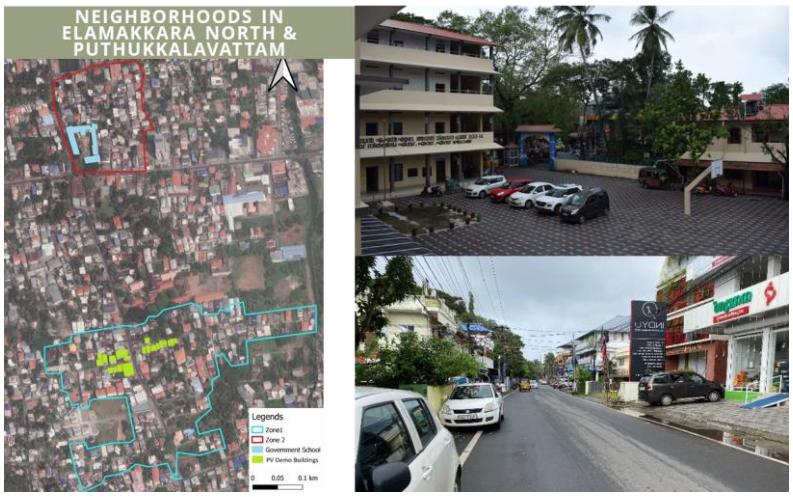
CITY LAB KOCHI

Pilot Project
Sustainable Neighborhood in the wards of Elamakkara North and Puthukkalavattam

About the city

The city of Kochi is located in the state of Kerala, in the southwest region of India on the Malabar Coast. The city's metropolitan region is home to approximately 600,000 inhabitants.
Due to its location and geographical features, the city has become increasingly exposed to the risks and concerns associated with climate change. Kochi lies barely 5 meters above sea level on average and extends along the coastline. The city is embedded into a complex network of rivers, tidal creeks, and backwaters, due to which Kochi has been regularly subjected to natural disasters like floods, cyclones, droughts, and landslides. Rising temperatures exacerbate the heat island effect in Kochi too. By the middle of the century, Kochi could be heavily affected by possible changes in precipitation patterns and sea-level rise. In addition, urbanization has an immense impact on the water ecosystem and increases the vulnerability to climate risks.

For more info visit: https://mgi-iki.com/de/city/kochi-indien/



OBJECTIVES

- Through rooftop solar power, the share of renewable energy increases, CO2 emissions will be reduced, and the self-supply of the neighborhood with electricity and thus the dependency on electricity generation decreases.
- Through decentralized sewage treatment and composting of organic waste, soil and water pollution is reduced, and the quality of living is increased.
- The green infrastructure stores rainwater and thus decreases the risk of flooding. The increased evaporation effect has a cooling effect, reducing the urban heat island effect.
- Showcase an integrated solution (solar – green building – water treatment) of a sustainable refurbishment in one neighborhood, which can be replicated in similar areas.

EXPECTED IMPACTS AND BENEFITS FOR THE CITY

Environmental

- Reduction of CO2 emissions through climate-friendly electricity generation
- Reduction of soil and water pollution through decentralized sewage treatment
- Contribution to zero emissions by the implementation of a nature-based solution
- Reduction of the stormwater runoff and risk of flooding by implementing green infrastructure
- Reduction of urban heat island effect by increasing the green and blue spaces

Social

- The neighborhood becomes more independent regarding electricity generation through rooftop solar power generation.
- Acquired support from local communities for the replication and implementation.

Economic

- Reduction of the monthly electricity bills.
- Less need for air-conditioning, therefore reduced cost for cooling.
- Reduced costs due to fewer flooding events.

CHALLENGES ADDRESSED

Heavy rainfall and stormwater
green infrastructure retains stormwater, thus reducing the runoff and the risk of flooding.

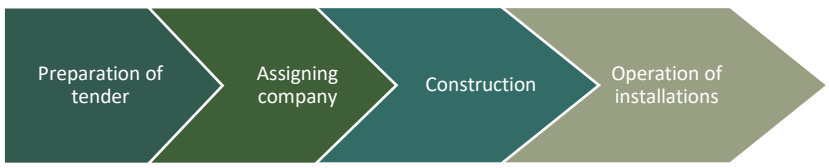
Water Pollution
Pollution of ground and surface waters, as well as the nearby backwaters, is reduced as the wastewater is treated through decentralized nature-based solutions.

Urban Heat Island
Green infrastructure development is an efficient way of enhancing microclimate.

Change in Biological system
Green areas as a potential habitat for diverse species.

Carbon and greenhouse gas emissions
Rooftop solar PV will utilize Kochi's solar potential in order to reduce CO2 emissions.

IMPLEMENTATION PHASES



CONTRIBUTION TO THE SDGs

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