

Urban Waste Management:

A Waste-to-Energy Plant to Improve the Barrio San Martin Dump in Paraná

National Technological University,
Paraná Regional School,
Electronics Engineering Department
Inglés II

Academic Year: 2022

Members:

- Enzo Juan Angel Acosta Darrichón
- Federico Agustin Usinger Kornschuh
- Facundo Nahuel Della Ghelfa

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Paraná



- ◆ 270 Neighborhoods
- ◆ 247,863 inhabitants
- ◆ 137 Square Kilometers
- ◆ 300 Tons of garbage daily

Our purpose

- ❖ Study and develop new forms of waste management
- ❖ Improve the current situation at the city's dump
- ❖ Focus on obtaining maximum efficiency in the recycling of waste
- ❖ Propose a waste-to-energy plant

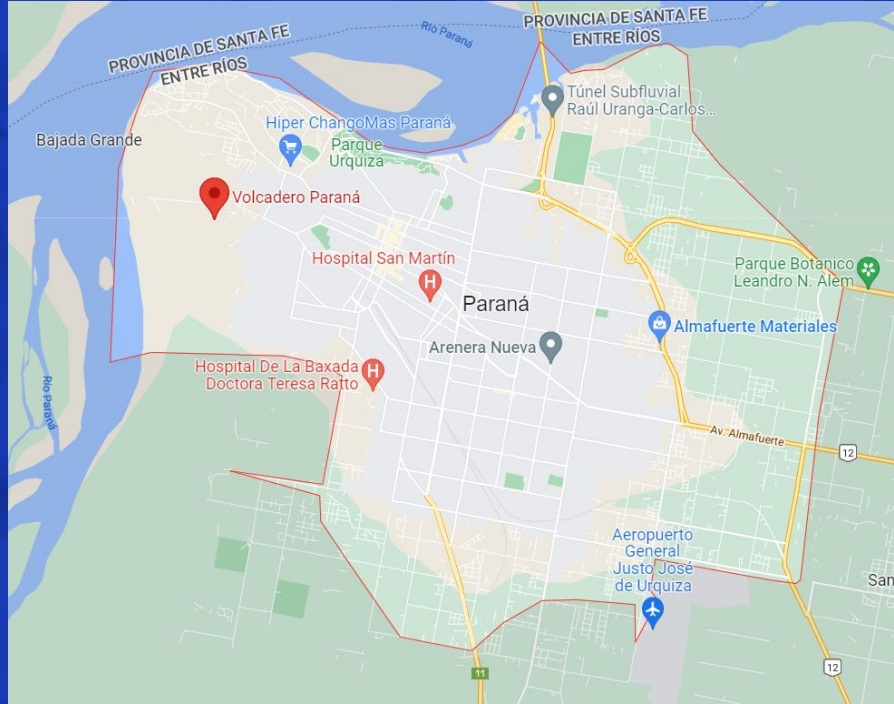
How are we going to cover these issues?

- ◆ We are going to:
 - ★ Show the city, indicating the areas of interest and the central focus of our problem
 - ★ Present and discuss the problem, indicating the causes
 - ★ Talk about the impact it has today
 - ★ Present our proposal as a solution to this



Problem Definition and Analysis: Description of the Context

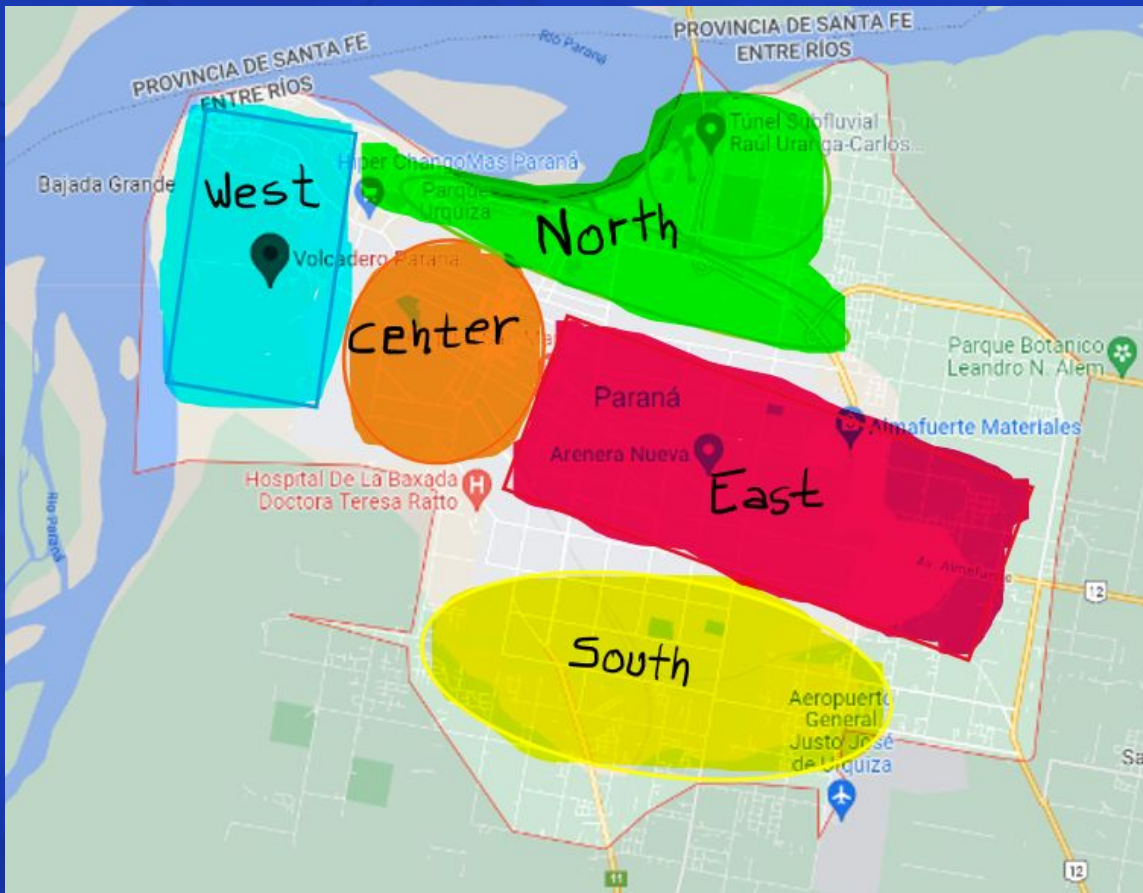
Paraná and its key places



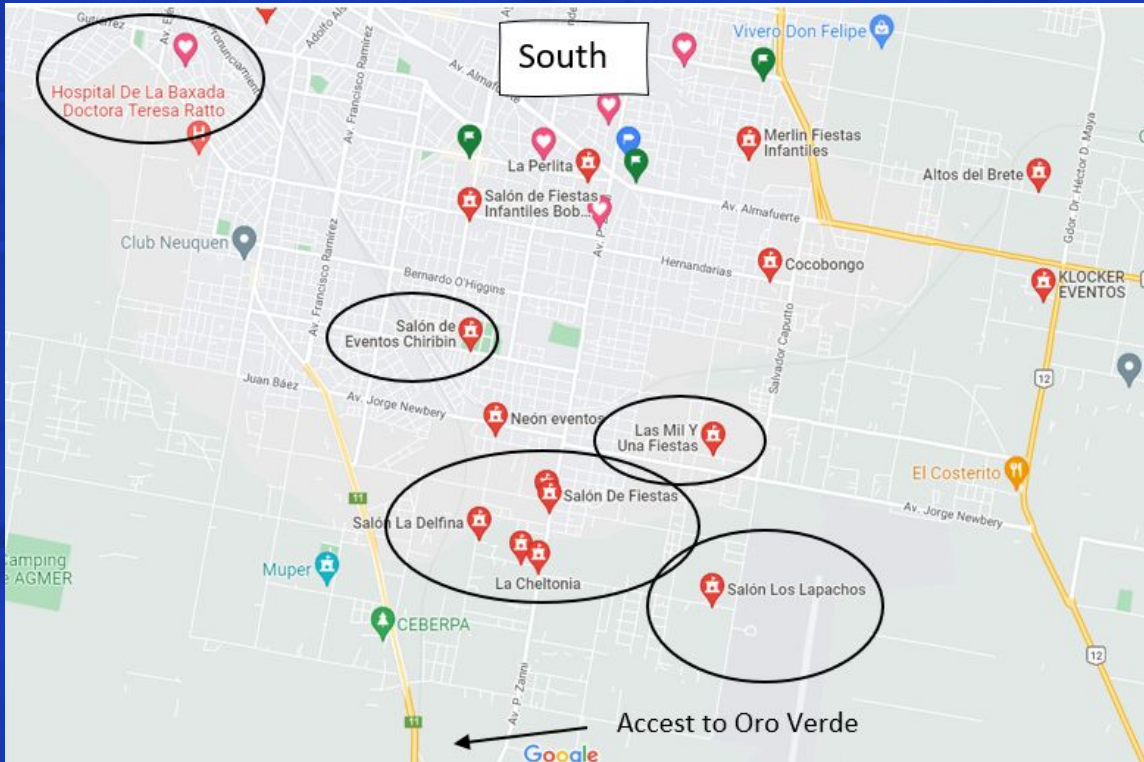
We are going to tour:

- South
- East
- Center
- North
- West

Problem Definition and Analysis: Description of the Context



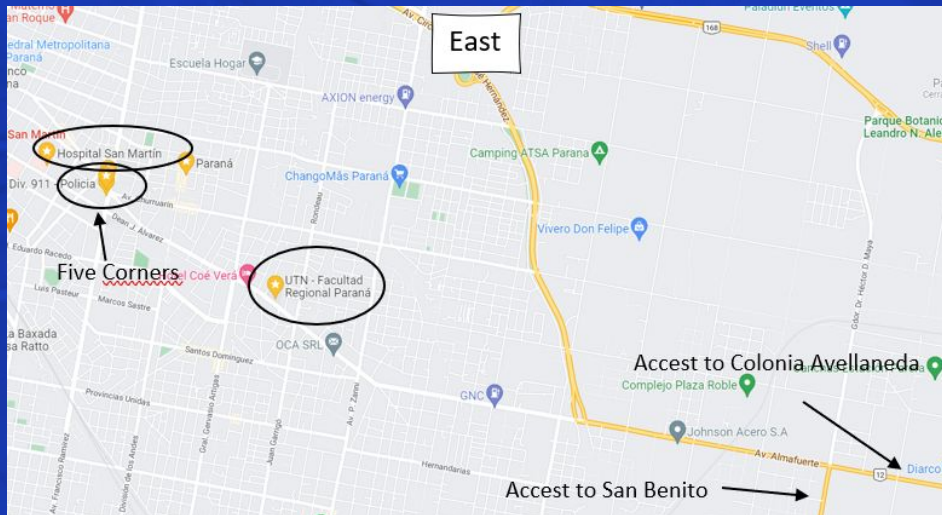
South



De La Baxada Doctora Teresa Ratto Hospital:



East



Five corners



National Technological University,
Paraná Regional School -->



Center

Tro de Mayo Square



Landmarks:

- ❖ Cathedral
- ❖ The Post Office
- ❖ The Municipality of Paraná
- ❖ Nación Bank
- ❖ UADER University
- ❖ San Martín pedestrian precinct

Center

the Province's Government House



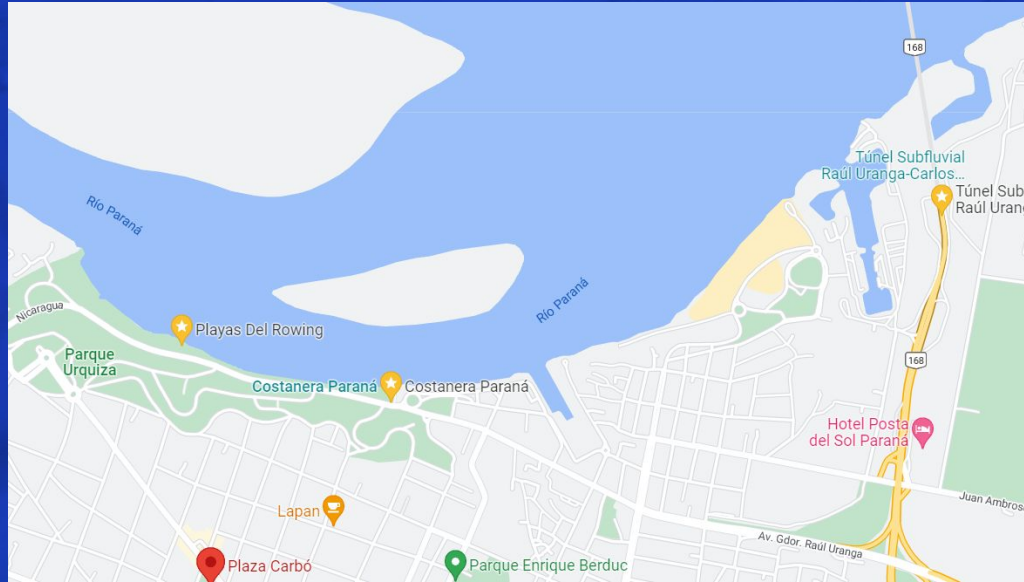
Carbó Square



Mansilla Square



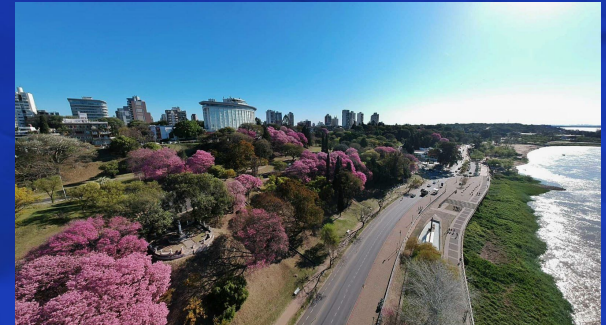
North



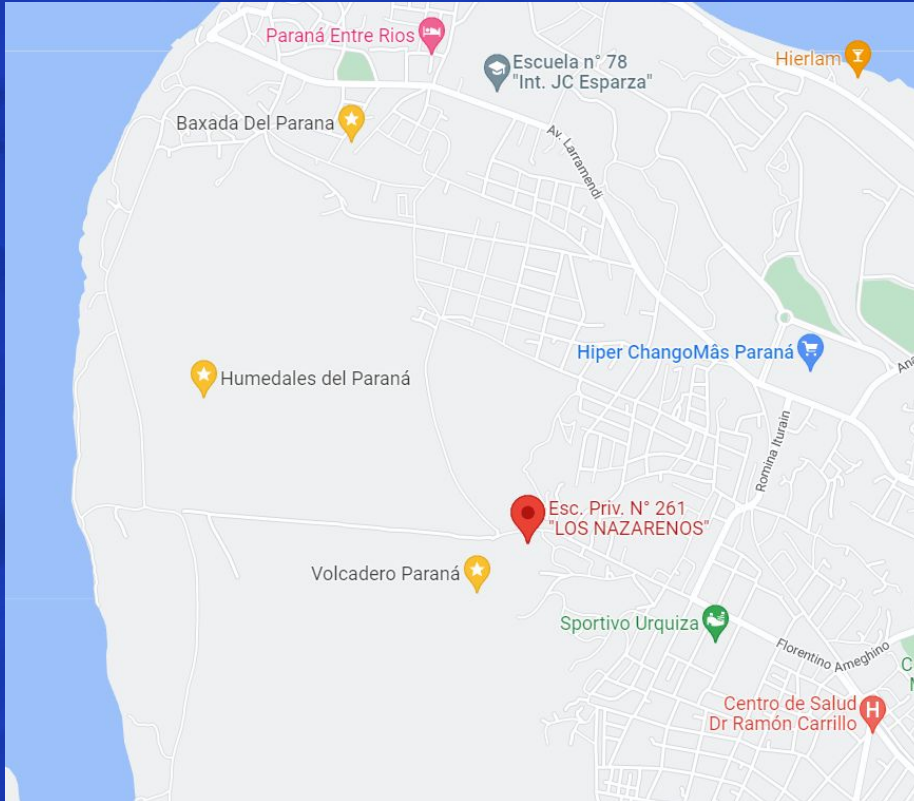
Urquiza Park



La Costanera



West



The wetlands



West



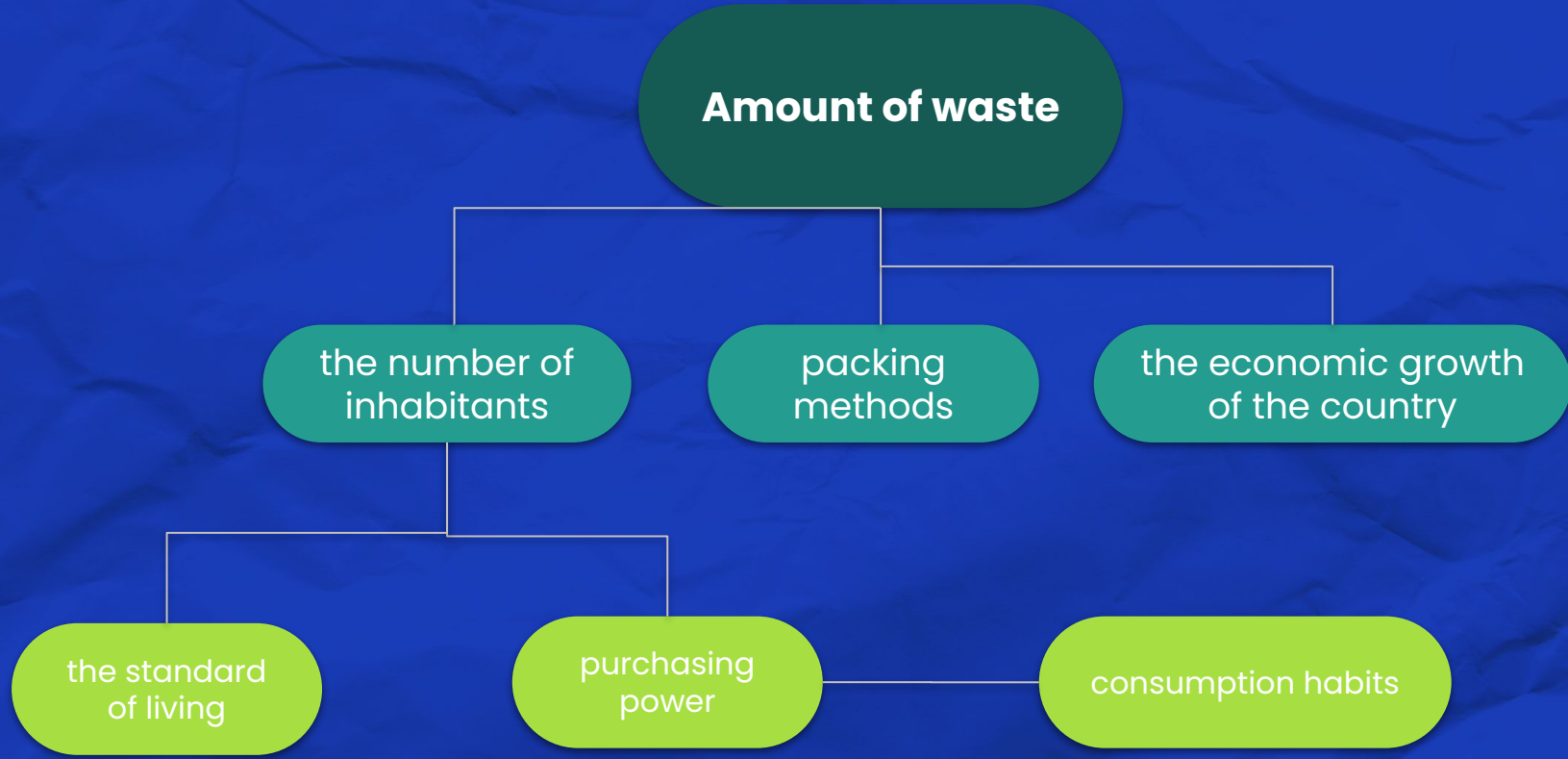
The Dump of Paraná





Problem Definition and Analysis: Problem Statement

Problem Definition and Analysis: Problem Statement



Final destination for USW

Controlled Landfills (CL)

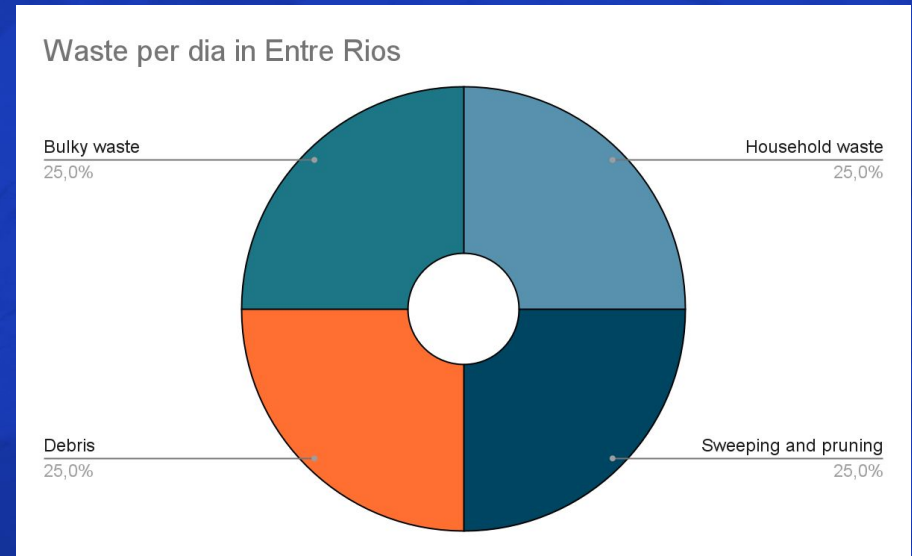


Open Air Dumps (OAD)



**In Entre Rios, each person generates approximately 1 kg of USW per day.
This kilogram is made up of:**

- ★ **Household waste**
- ★ **Sweeping and pruning waste**
- ★ **Debris**
- ★ **Bulky waste**



One of the main environmental problems in 2014



Manuel Belgrano sorting plant



- Inauguration on december 30, 2014
- Reasons:
 - Minimization of the amount of waste disposed of in the open dump
 - Recovery of waste with economic value
 - Social inclusion of current informal recyclers
 - Consolidation of a key stage in the city's CMUSW
- Percentage of garbage that it recycles: 40% (inorganic)





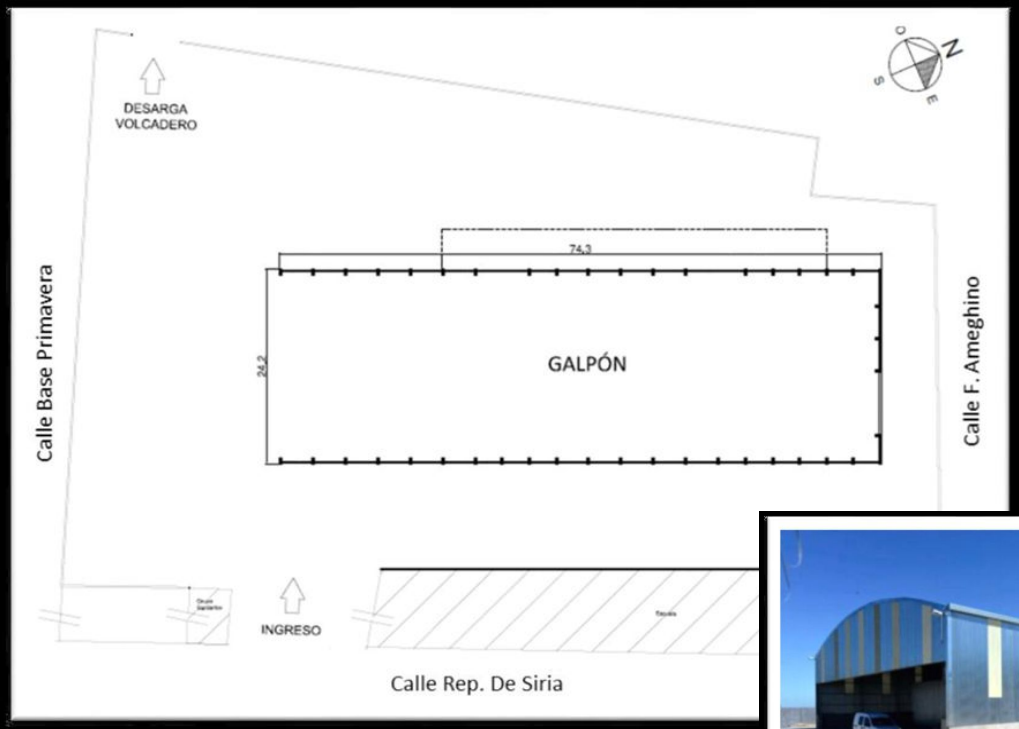
Problem Definition and Analysis:
Description of scenes that help picture
the problematic situation

Problem Definition and Analysis: Description of scenes that help picture the problematic situation



Waste sorting plant: it is located inside the dump of the city.

Problem Definition and Analysis: Description of scenes that help picture the problematic situation



Characteristics of the sorting plant

Problem Definition and Analysis: Description of scenes that help picture the problematic situation



Sorting machinery used

Problem Definition and Analysis: Description of scenes that help picture the problematic situation



The Open Air Dump

Problem Definition and Analysis: Description of scenes that help picture the problematic situation



People who live in the dump



Problem Definition and Analysis: Identification and analysis of causes or factors that give rise to the problem

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Causes

- Lack of awareness.
- Lack of planning.
- Lack of productive diversity.
- Lack of political commitment.



Problem Definition and Analysis: Identification and description of the consequences

Problem Definition and Analysis: Identification and description of the consequences

Consequences

- ❖ Overflow from dump hill.
- ❖ Environmental pollution.
- ❖ Spread of bad odors.
- ❖ Spread of diseases.

Problem approach

Problem approach

solution proposed → **developed countries** → **Waste-to-Energy**



**The Volcadero Waste
Sorting plant**

Problem approach

Processes:

- ★ **Sorting and separating waste**
- ★ **Transporting the waste to the incinerator**
- ★ **Incinerating waste**
- ★ **Heating water**
- ★ **Filtering of gases and ashes produced**
- ★ **Generating energy through water vapor**
- ★ **Transporting water vapor through pipes to distribute hot water**
- ★ **Transporting heat to heat homes**
- ★ **Separating the fine ashes from the coarse**

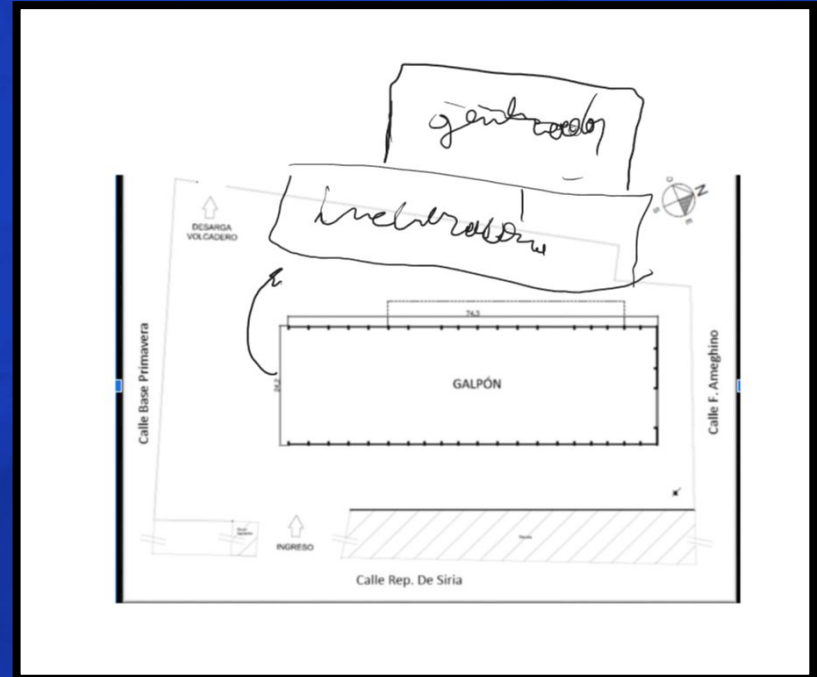
★ Do implement

★ Do not implement

★ Implemented

Problem approach

- More efficiency
- Location problem



Problem approach

Processes:

- ★ Incinerating waste
- ★ Heating water
- ★ Filtering of gases and ashes produced
- ★ Generating energy through water vapor

Problem approach

Strength:

- **Garbage reduction**
- **Pollution reduction**
- **Disease reduction**
- **Generation of jobs**
- **Energy generation**

Weakness:

- **Classification of work in medium risk**
- **Use of fossil fuels for first operation**

Conclusion

What is the problem?

- ❑ Excessive generation of waste
- ❑ Poor waste management

What we propose?

- ❑ Construction of a waste-to-energy plant
- ❑ Allow the burning of waste, the treatment of ashes and the production of energy with the heat generated

How are we going to implement this?

- ❑ Construction of less complex and more economical equipment.
- ❑ Use of existing place.
- ❑ Skilled labor training needed

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