



Inglés I - Skills Integration Project

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Title: Soil Contamination by Plastics: Collection and Recycling of Plastic Waste from the Paraná Landfill.

1. Introduction

Good morning. We are going to introduce ourselves

My name is Bruno Ibarra and I am 19 years old. I am from Parana. I finished high school in 2020. At present, I am studying Civil Engineering.

My name is Paulina Cian. I'm 19 years old. I'm from Parana. In 2020, I finished high school and the following year I started university to study Civil Engineering.

My name is Mariam Machado Riquelme and I am 22 years old. I am from María Grande but I live in Parana. I finished high school in 2019 with a Master Builder degree. At present, I am working as a Master builder, and studying Civil Engineering.

We are in the second year of the career path. We are Civil Engineering students at the National Technological University, Parana Regional School of Engineering.

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The soil is one of the most important natural resources and it is a non-renewable resource. Soil is essential to life, like water and air. Its preservation is essential for food security and our sustainable future. It is an element of link between biotic and abiotic factors, and it is considered a habitat for the development of the plants.

In the last years, it has become more and more evident that the activities of the man have created situations in which the rate of soil loss is greater than its formation. This dangerously alters its natural balance, and one of the processes that influence its deterioration to a greater degree is pollution by plastics.

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The purpose of this presentation is to discuss the problem of soil contamination by plastics in the landfill of the city of Paraná. We are also going to talk about the importance of plastics collection for future recycling.

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To achieve our purpose, firstly, we are going to show the area of the city that is the focus of this work. Secondly, we are going to discuss the problem related to the contamination of the soil by plastics in the landfill. Next, we are going to introduce the factors that give rise to this problem. After this, we are going to discuss the impact that plastics have on the soil. Finally, we are going to describe our action plan to approach this problem.

2. Problem Definition and Analysis

2.1. Description of the Context





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The Paraná landfill is located on Florentino Ameghino street, in the West of the city. It is a very large area destined for garbage. There is a neighborhood a few meters from the landfill so probably the neighbors are exposed to its pollution. There is abundant vegetation around the garbage.

The landfill is not a nice place, it is a filthy and unhealthy place. There are many garbage heaps, which are constantly growing and burning, which produces a lot of pollution, especially in the air and the soil. There are usually lots of people collecting garbage. Many people collect food from the garbage to consume.

2.2. Problem Statement



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Now, we are going to discuss the problem of soil contamination by plastics. It is estimated that around 300 tons of waste are taken daily to the landfill. Many people from the surrounding area gather there trying to rescue something that serves as food, or some material that may be useful for a sale that allows them to earn a little money. There are fires caused by the same inhabitants of this sector. They do this in order to reduce the large amount of waste, especially plastic.

The plastic, which is the main material that makes up most of the waste we generate in the city, is one of the main causes of soil pollution. The landfill is full of garbage that pollutes but almost everything can be decomposed or reused. However, plastic, in addition to polluting, decomposes slowly; it can take thousands of years to do so. This is not favorable for the environment or for people.

2.3. Description of scenes that help picture the problematic situation



In this photo, we can see a part of the landfill. There are animals and people. There is also smoke and garbage.

In the foreground of the photo, there is a lot of garbage, especially bags. there are a lot of plastics; it is a heap of garbage.

In the center of the picture, we can see three people on top of the heaped collecting garbage. The left of the people, we can see two dogs eating garbage. Also, to the right of the people, there are two or three big bags, which we believe to be garbage collected by the men.



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In the background of the picture, we can see several smaller garbage heaps. Also, there is smoke that comes from the burning of this garbage.



This picture is from another part of the landfill. In the center of the photo, we can see five or six pigs eating from the garbage. Surely there are more animals in the area. Also, there are some withered branches and others with leaves.

The left of the photo, we can see another heap of garbage, and on the right of the photo, we can see several trees with few leaves. In the foreground of the photo, there are a lot of plastics buried in the soil, especially bags, which produce a lot of pollution.



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This is a picture of the landfill floor. We can see a lot of garbage scattered and buried on the ground, also burning.

In the foreground of this picture, we can see a road where the garbage truck probably enters. There is a person walking on the road. He must be a collection worker because of his clothing. In this photo we can clearly see the pollution in all its aspects, mainly from the ground as the waste releases harmful chemicals into the soil which can then seep into the groundwater or other surrounding water sources.

2.4. Identification and analysis of causes or factors that give rise to the problem

There are three main causes to soil pollution by plastic in the Paraná landfill.

- 1) Overconsumption of plastics is one of the causes. As the majority of the products are made of or contain plastic, our increasing consumption directly or indirectly leads us to consume more plastics. Single-use plastics are easy to make, use and dispose of but very difficult to degrade. Its consumption makes our non-degradable garbage increase day after day.
- 2) Another cause is related to people's information about plastics. The little information about plastics, the impact they produce and the non-separation of waste, is another cause of this contamination.



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- 3) The lack of citizen awareness and environmental policies means that we generate more waste and do not separate it properly. For example: when people throw garbage without separating it, this is difficult to recycle.

2.5. Identification and description of the consequences

There are three main consequences of soil pollution by plastic in the Paraná landfill

- 1) Public health threat is one of the most serious consequences. The production of plastics uses products that can cause diseases such as cancer. The health of people and animals are affected by exposure to these plastics.
- 2) Another consequence is the burning of plastics: it is toxic because they are derived from petroleum and are composed of carbon. Microparticles are released into the air. In addition, these contribute to the growth of the greenhouse effect.
- 3) When plastic falls to the ground, it releases toxic substances that damage its properties and then seep into groundwater as well as ecosystems. The small plastic fragments can be carriers of organisms dangerous to health. These produce negative consequences in the population.

3. The Way Forward

3.1. Problem approach

As a solution to the problem, we propose the extraction of all plastics from the landfill with excavators. These plastics go through a washer and dryer to remove dirt and other debris. On the one hand, the plastics that can be reused are taken to the existing recycling plant named "Manuel Belgrano", which is located a few meters away from the landfill. On the other hand, the plastics that cannot be reused go to a new waste-to-energy plant that should be designed and built near the landfill, where they are incinerated and used as fuel to generate electricity through combustion with clean technology that filters gasses.

To prevent the landfill from returning to this situation, we believe that the change should start with commitment and responsibility from the society with waste separation. The idea is putting more dumpsters for recyclable and not recyclable plastics, for the correct separation and transport to the Manuel Belgrano plant.



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3.2. Strengths and Weaknesses of the Proposal

This solution has many positive aspects. In addition to preserving the environment and reducing pollution, plastics that cannot be recycled are re-used. The construction and operation of the new plant will also generate jobs.

On the other hand, as a weakness, the new plant needs good management and care; otherwise, it can generate adverse effects to what is proposed. Also, the new plant is expensive.

4. Conclusion

4.1. Final statement

In this presentation we have discussed the problem of soil contamination by plastics. After analyzing its causes and consequences, we have made reference to a possible solution, which is possible to implement with state financing to acquire the new plant, in addition to the location of more containers. Thus, these measures may help reduce plastic pollution in the soil throughout the city and increase people's quality of life.

References

- [1] "Biomass explained", eia.gov. <https://www.eia.gov/energyexplained/biomass/waste-to-energy-in-depth.php> (accessed Oct. 10, 2022)