

Pollution of the Paraná River: Sanitizing and Systematizing the Colorado Creek

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Summary— The project addresses the problem of pollution of the Colorado Creek in the city of Paraná, Entre Ríos, Argentina. The creek is not taken care of, which is causing damage to the environment. This pollution harms animals and the people living nearby. The main causes are weak environmental laws and lack of public awareness of the impact of pollution. The consequences include the loss of species, the spread of diseases due to contact with polluted water, and negative economic effects that affect both tourism and local development. The project proposes a plan to clean up and systematize the creek, with the implementation of filtration systems to improve water quality and reduce flood risks, which is expected to have a positive impact on the city and the environment in the long term. This project is expected to contribute to the analysis of measures to solve the problem of creek contamination.

Keywords: Creek pollution, Water quality improvement, Creek sanitation, creek systematization.

Resumen— El proyecto aborda el problema de la contaminación del arroyo Colorado en la ciudad de Paraná, Entre Ríos, Argentina. El arroyo no se cuida, lo que está causando daños al medio ambiente. Esta contaminación perjudica a los animales y a las personas que viven cerca. Las causas principales son la falta de leyes medioambientales y de concienciación pública sobre el impacto de la contaminación. Las consecuencias incluyen la pérdida de especies, la propagación de enfermedades debido al contacto con aguas contaminadas y efectos económicos negativos que afectan tanto al turismo como al desarrollo local. El proyecto propone un plan de limpieza y sistematización del arroyo, con la instalación de sistemas de filtración para mejorar la calidad del agua y reducir los riesgos de inundación, lo que se espera que tenga un impacto positivo en la ciudad y el medio ambiente a largo plazo. Se espera que este proyecto contribuya a resolver el problema de la contaminación de arroyos.

Palabras clave: Contaminación de arroyo, Mejora de la calidad del agua, Saneamiento de arroyo, sistematización de arroyo.

I. INTRODUCTION

This project is based on the city of Paraná, which is the capital of Entre Ríos, Argentina. The area of the city is 137 square kilometers and it has a population of about 391,962 people, according to the last census in the year 2022. The city is located on the banks of the Paraná river and there are some creeks in its territory, among which the Colorado creek can be named.

The lack of maintenance in the Colorado creek is part of an environmental problem affecting the Paraná river.

This inadequate maintenance has a direct impact on the biodiversity. Also, it produces a high loss of species because the aquatic habitats suffer damage from this problem.

The first purpose of this work is to describe and address the problem of the pollution of the Colorado creek, located in the city of Paraná. The other objective is to analyze these environmental issues in detail and propose an effective engineering solution that may help reduce pollution levels and eventually eliminate them.

To fulfil these purposes, this project is organized as follows. This project is going to start with a description of the Colorado Creek and its importance. Then, it is going to describe the pollution problem in the creek. Next, it is going to show pictures of the creek pollution to help understand the issue better. After that, the project is going to explain the causes of the pollution. It also is going to include a plan to clean the creek and discuss the advantages and unfavorable points of this plan. Finally, it is going to end with a conclusion that describes how this project can help the city and the environment. This project is expected to contribute to the analysis of measures to solve the problem of creek contamination.

II. PROBLEM DEFINITION AND ANALYSIS: POLLUTION OF THE COLORADO CREEK.

A. Description of the Context

The Colorado Creek is situated in Paraná, the capital of Entre Ríos, Argentina, which is a city with approximately 390,000 residents. The city is situated on the banks of the Paraná River, one of the most important rivers in America, from which most of the residents obtain their water.

The Colorado creek flows through urban, rural, and industrial areas, making it an important creek for its region, as well as being quite extensive. Eventually, Colorado Creek merges into the Paraná River, as Fig. 1 shows, transporting all the sediments and waste that appear along its path towards the river.



Fig. 1. Mouth of the Colorado creek.



Fig 3. Stagnant water in the creek

B. Problem Statement

The Colorado Creek in the city of Paraná has a significant problem of contamination. The water in the creek contains harmful substances, including untreated sewage and chemicals, which are frequently present. This pollution affects the creek and also puts the Paraná River and the environment at risk. The contamination is a serious problem that harms the natural area and the people who live in Paraná.

C. Description of Scenes that Help Picture the Problematic Situation

Contamination in the Colorado Creek becomes evident in various ways, impacting the health of different species. There are many scenarios that can help understand the problematic situation. This creek in Fig. 2 has a significant amount of garbage. This trash is found in all parts of the creek.

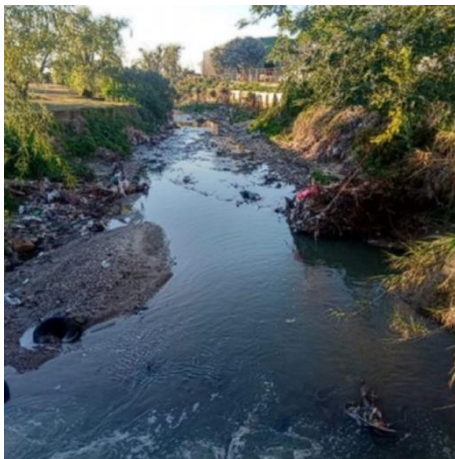


Fig 2. Garbage in the Colorado creek

The water is stagnant in different parts of the creek due to accumulated garbage. Fig. 3 shows how this pollution impacts this creek and the area around it.

Fig. 4 is similar to the previous Fig. 2 and Fig. 3, and also shows the stagnation of water and accumulated garbage. The waste is mainly composed of plastics and metals.

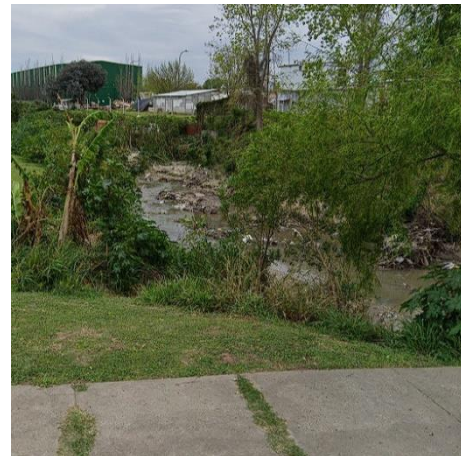


Fig 4. Contaminated area.

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

There are many causes of the problem addressed in this project. One reason for the problem of untreated sewage and chemicals in the Colorado Creek is the lack of funding for proper waste management. The city of Paraná does not have enough resources to invest in cleaning and maintenance of the creek.

A further reason connected with this situation is that the environmental laws are not strongly enforced. Even if there are rules to protect the water, they are not always followed.

Another reason for this situation is the lack of public awareness about the importance of keeping the creek clean. Many people in the city might not know the impact of throwing garbage into the creek.

E. Identification and Description of the Consequences

The presence of harmful substances in the creek causes serious health problems for the residents of Paraná and nearby areas. The contaminated water can carry bacteria that can cause sickness to people who come into contact with it.

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It is especially dangerous in areas where the water from the creek is used for daily activities.

Another consequence is related to the fact that the pollution of the Colorado creek harms the plants and animals living in and around it. This can lead to a loss of biodiversity, because species that depend on clean water cannot survive.

A further consequence has to do with the economic impacts on the city due to the pollution of the creek. A polluted environment reduces the quality of life for residents and makes the area less attractive to tourists and businesses. This can result in a decrease in local businesses and slow down the development of the city.

III. THE WAY FORWARD: SANITIZING AND SYSTEMATIZING THE COLORADO CREEK

A. Problem Approach

The proposed solution for the Colorado Creek includes sanitation and systematization to manage rainwater flow and reduce flood risks. A multi-stage filtration system cleans the water before it flows into the Paraná River, removing pollutants and improving water quality. This helps prevent flooding and protects the river, as Fig. 5 shows. Below, the measures to carry out this project are presented.



Fig 5. Systematization of the creek

1) Sanitation and Systematization of The Colorado Creek

The first measure is to make a plan to clean the Colorado Creek. This plan would cover 1,600 meters from where the creek starts to where it ends in the Paraná River. The system should have an open channel to manage rainwater

from the land near the creek. This makes sure extra water flows out safely, reducing the chance of floods nearby.

2) Water Quality Improvement

To make the water cleaner before it reaches the Paraná River, a special filter system is put in. This system has metal bars to catch trash, a part that lets heavy stuff sink to the bottom, and a natural filter to lower water pollution. These measures help make the creek healthier for plants and animals.

B. Strengths and Weaknesses of the Proposal

The cleaning and water improvements for the Colorado creek may bring about important benefits to the environment. By making the creek and its surroundings healthier, this project may help create a more balanced and sustainable ecosystem. Also, the new system reduces the risk of floods, protecting homes and businesses nearby.

However, this solution also has weaknesses. This project is expensive to carry out, especially because of the advanced filter systems. It needs careful financial planning. Also, the filters require regular maintenance, which means more resources and good management to keep them working well over time.

IV. CONCLUSION

In conclusion, this project focuses on the sanitation and systematization of the Colorado creek. The plan would improve the water quality and make the area healthier for plants, animals and people living nearby.

Although the project requires financing and regular maintenance, it brings important benefits. It protects the environment and improves life in Paraná. This proposal is expected to have a positive impact on the city and the creek in the long term.

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The present project is a skills integration activity in Inglés I at Universidad Tecnológica Nacional, Facultad Regional Paraná, carried out by EFL engineering students. The yearlong project requires students to delve into a problem in the city where they live and to address it by means of a simple project in English. Should the reader have any questions regarding this work, please contact Graciela Yugdar Tófaló, Senior Lecturer, at gyugdar@frp.utn.edu.ar