

Evaluation of the urban impact in the riparian forest and the water quality of the Lanceiro River located in Caçapava do Sul, Brazil

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ABSTRACT:

This study aims to evaluate how the urban impact (depletion, litter, agriculture, livestock, etc.) changes the riparian forest and water quality of the Lanceiro River, located in the tourist area of Chácara do Forte, rural area of Caçapava do Sul. For this purpose, it was collected and analyzed the water and the riparian forest from three points of the river, including its tributaries. From the perception that the object of study percolates an area of tourism and urbanization, it was verified that along the river the accumulation of pollutants and contribute to the degradation of the riparian forest and the quality of the water.

Key words: Lanceiro River, riparian forest, urban impact, water quality.

INTRODUCTION

Man's activity comes from time to time, altering and impacting the environment, and there is a necessity to find solutions to reduce and reverse the effects of the depletion of natural resources and the great environmental impact that is currently happening.

Overuse of land, pollution of rivers and lakes through industrial and residential sewage, urbanization, livestock farming, the launching of solid waste on streets and rivers, among other reasons, both natural and man-made. The ecosystem of the site, can cause environmental impacts on nature, such as: changes in micro-climate, pollution of rivers and underground aquifers, pollution of the atmosphere, extinction of several native species of fauna and flora, soil compaction and impoverishment, among others.

Relating the occupation process to the degradation of the ecosystem, we can not fail to talk about the ciliary forest, where they are indispensable for rivers and lakes.

According to the State Department of the Environment of Paraná, the riparian forest is the vegetal formation located on the banks of streams, lakes, dams and springs. It is also known as gallery forest, floodplain forest, vegetation or riparian forest. Considered by the Federal Forest Code as "permanent preservation area", with several environmental functions, it must respect a specific extension according to the width of the river, lake, dam or spring.

The riparian forest is also of extreme importance for nature. With the use of natural areas and soil, where they reduce the original vegetation, where the riparian forest can disappear.

"These forests are formations associated to watercourses of variable width and varying in their structure and floristic composition. They play important ecological and hydrological functions in the river basin, improving water quality, allowing a better regulation of water resources, providing stability to marginal soils and promoting the better development, support and protection of riverine fauna and aquatic organisms [1]."

The degradation of riparian forests, in addition to disregarding the legislation, which makes it mandatory to preserve them, result in several environmental problems. The riparian forests function as filters, retaining the remains of polluting pesticides and sediments that would be transported to the water course directly affecting the quantity and quality of the water and consequently the aquatic fauna and the human population [2].

Another issue is the use of water quality that consist in the use of variables that correlate with changes in the microbasin, whether of anthropogenic or natural origin.

Each lotic system has its own characteristics, which makes it difficult to establish a single variable as a

standard indicator for any water system. In this sense, the search for field work is to obtain water quality indexes that briefly and objectively reflect the changes, with emphasis on human interventions such as agricultural, urban and industrial use [3].

The interactions between the various variables measured in a water sample constitute the starting point for water quality assessment, provided that these interactions are obtained from a sample distribution in space and time of the system variables to be studied [4].

For an ecological interpretation of surface water quality and / or to establish a monitoring system, it is necessary to use simple methods that provide objective and interpretable information, based on specific criteria that take into account the peculiar characteristics of water resources [5].

In this respect, the use of water quality indexes is an attempt that any surface water monitoring program envisages as a way of monitoring, through summary information, the possible deterioration of water resources along the river basin or over time.

Several techniques for the elaboration of water quality index have been used based on the physicochemical characteristics of the water, besides indexes based on biological characteristics, commonly associated to the trophic state of the rivers.

RESEARCH METHOD

In order for the objectives to be fulfilled and the hypothesis tested, a bibliographical research on the subject was carried out in journals, articles and books. Afterwards, a field survey was carried out in the tributaries and along the Lanceiro River.

The instruments of research and data storage were done through a digital camera, writing data on drawing boards, taking samples from the water using bottles of at least 600 ml and 2 liters;

The methods of analysis are divided into two: analysis for the perception of riparian forest and water.

The analysis was done in a quantitative and qualitative way. The quantitative analysis will be done in a descriptive statistical form, whose purpose is "to describe, summarize, aggregate and graphically present research data" [6].

In the qualitative analysis, the analysis starts from the collection of data and can not be generalized, "the analysis of the data will have the objective of simply understanding a phenomenon in its most intense sense, instead of producing inferences that may lead to the constitution of general laws or To extrapolations that allow us to make valid predictions about the future reality [7]."

In addition to the qualitative and quantitative analytical method, a comparative analysis between the data is made with the idea of "identifying categories, patterns and relationships between the collected data, in order to unravel its meaning through interpretation and comparison of results with other researches and theoretical references [7]". Mainly for the assessment of the riparian forest (delimitation and measurement), the Google Earth program, offered free of charge by Google Inc. for its deforestation, was used.

The water analysis was performed according to turbidity, oxygen and total coliforms and thermotolerant, analyzes were performed on the first day and the fifth day of collection.

For turbidity, the HACH turbidimeter and the nephelometric method were used, the Winkler method was used for the oxygen analysis and for the total and thermotolerant coliforms the substrate method was used with the aid of Colilert.

The method of evaluation of the ciliary forest was made at the points of water collection, located from a GPS. Subsequently, satellite analyzes of the delimited sites were carried out, which, with the accompaniment of the scale, can be verified permanent protection area, which is evaluated in a paired section of the river up to 30 meters. This delimitation is defined by the forest code according to the Brazilian Law No. 12.651, for rivers up to 10 meters wide.

In relation to water, an average of one liter was collected, stored in bottles. The sample was taken from surface water in the direction of running water, and after it was taken for laboratory analysis, "performed indoors and with its own instruments. It was taken 5 samples and measured the ratio of them. It [...] provokes the phenomena and observes them. It offers the immediate advantage of controlling the entire chronology of research from the initial moment of the context [6]."

RESULTS AND DISCUSSION

The results of the water are shown in the figure below.

Table 1 – Water analysis

	pH	Turbidity	Dissolved Oxygen	Dissolved Oxygen (5 day)	BOD	Total Coliform	Thermotolerant Coliforms
SAMPLE 1	7.9	33.9	6.6	4.4	2.2	+	+
SAMPLE 2	7.0	19	6.4	6.4	1.6	+	+
SAMPLE 3	7.0	37	7.2	7	0.2	+	+

It can be noticed that in relation to the first day of collection sample 3, which is characterized as the beginning of the Lanceiro River, the quality of the water was emphasized, presenting greater width and depth of the river, greater turbidity and BOD, in spite of a PH More acidic.

All samples showed total coliforms and thermotolerant coliforms, as well as, through observation of the researchers, solid and urban waste in the sites, which indicates the urban impact on water quality.

The analysis of the ciliary forest, based on the images extracted from the Google Earth software, using the respective coordinates, is seen that in point 2, it does not have the riparian forest area provided for in the Brazilian Forest Code, considering the possible environmental damage that agriculture is causing the local riparian forest.

Analyzing the images of point 3, it is possible to perceive a greater degradation of the ciliary forest, characterizing the local natural landscape caused by the anthropic action.

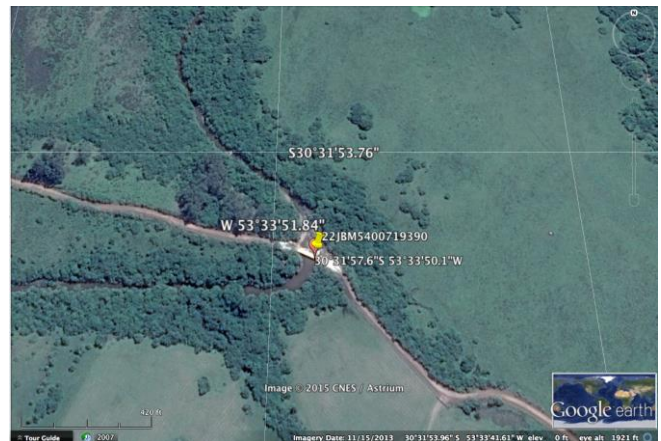


Fig. 2 – Sample 2 - Promorar stream – Lanceiro River affluent

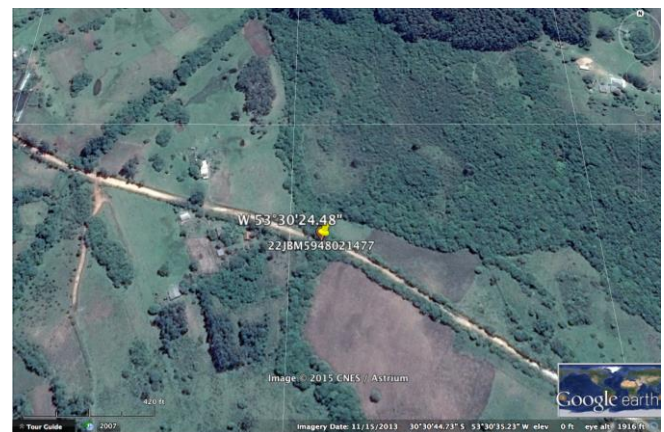


Fig.3 – Sample 3- Lanceiro River

CONCLUSION

The focus of the final reflection is on a close connection of ecology, a science that studies the abundance and distribution of species, with the behavior of a particular species, humans, because the existential sense of scientific research surrounding the environment turns Largely for the environmental impacts caused by man, this theme has been discussed for decades and in this work we see a scientific, but at the same time social view since it involved the relationship of urbanization, agriculture and tourism with environmental impacts.

According to the results obtained in this paper, it is extremely important that the modern man learn how to live harmoniously with the other species that coexist in the common home for every form of life, that is, inside of the planet Earth. There is a clear need to break the paradigm that to aid in the recovery of the planet requires only major scientific innovations and great governmental attitudes at the global level,

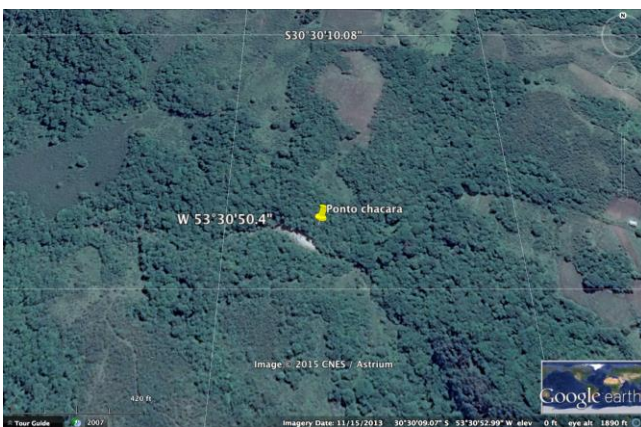


Fig. 1 – Sample 1 - Farm – Lanceiro River affluent

these manifestations would lead to a minimization of environmental damages. However, through this research it is possible to conclude that the centrality of the mitigation of anthropogenic environmental impacts is the individual awareness of each human person in order to preserve the environment at a regional and local level.

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