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CONSIDERATION ABOUT A CONSERVACIONIST STUDY ABOUT THE MICRO BASINS HYDROGRAPHICS OF THE RIVERS DOS APERTADOS AND TRÊS BOCAS, NORTH OF PARANÁ – BRAZIL

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ABSTRACT

The environmental planning in hydrographic micro basins may minimize the incidence of environmental impacts as consequence of the human indiscriminate action. The hydrographic basin is worldly recognized as the best unit for handling natural resources. Thus, a methodology for diagnosis of the real situation of natural resources, in a basin, turns to be a necessary tool for the preservation and management of these resources. The identification of the different kinds of predominant vegetables informs, chiefly, about the level of soil protection, since the vegetation is responsible for the protection against the impacts of the raindrops (*splash*), by the reduction of the speed of surface outflow (*runoff*), through the increasing of the land ruggedness and greater soil structure constitution that may offer greater resistance to the action of the erosive processes. Besides, the collected data about the covering vegetation generally comes along with the information about the current use of the soil, since they both are strictly related. Several authors have pointed out the importance of geo morphological mappings of environmental planning projects. The use of the cartography and geo morphological information aim to represent the physiography of the landscape,

considering the elements identification or environment of transport and accumulation, characterization of the morph genetics processes, and the human action implications. From the environmental point of view, the landforms are factors that influence the local hydrological conditions and specific top climatic. In this sense, the micro basins of Ribeirões dos Apertados and Três Bocas located between the municipalities of Londrina and Arapongas, North of Paraná, though constituted by fertile soils, Nitossolos and Argissolos, present a mainframe of environmental degradation common to other micro basins of the region, or, the lack of banks vegetation, the action of erosive processes, blocking the water fountains, and turning unviable the maintenance and increasing of the productivity of these areas. This study aims the composition of an environmental diagnosis of a limited area between two micro basins, as well as to evaluate the system of handling the soil and the effectiveness of conservationists' practices that have been used in order to present an environmental planning. It can be observed that in some agricultural areas, at least in the beginning, between two micro basins, some conservationists practices were used as handling and use of rural soil, the build of terraces, recovering of dirty roads, and suitable handling of the agricultural defensive packing, among others. But what is really outstanding in the properties, like everything else in Paraná state, is the introduction of The Direct Planting System. The results of these actions mainly when working together with the responsible organs of agricultural management, are effective in the improvement of environmental conditions for the agricultural development activity, rather with the increasing in production and maintenance of the environmental balance in the micro basins. It was noticed also that in many rural properties of the studied area, are beginning to adopt the direct planting system. However, it is necessary to guide the human occupation in order to keep safe the areas intended to be of environmental preservation, aiming the conservation of the natural resources, the strong environmental fragility and high susceptibility to erosion of this area of study.

Key words: micro basins; handling and soil conservation; Direct planting system.

INTRODUCTION

In the last few years it has grown the concern about the conservationism and the use of the natural resources, mainly concerning to the streams and soil. These resources need to be explored in a proper way, aiming to keep the capacity of production and, at the same time, to decrease the environmental impacts caused by the human action.

At the moment, there are production and conservationist techniques, which can sensibly diminish the negative effects caused to the environment and, among them, we can quote: Terracing, the Direct Planting System, Biological Vermin Control.

The subject of the study involves two of the Hydrographic sub basins of Tibagi River, inserted in its lower portion: the Ribeirão dos Apertados Micro basin of Ribeirão Três Bocas micro basin, which sources are located close to the urban areas and go towards East up its mouth into the Tibagi River. Their ways cross an agricultural area with intense activities and natural reminiscent vegetation, the "Mata dos Godoy", which still remains untouched because it is a preservation area.

Once they are in this region, they present some degradation environmental process, the soil erosion resulting of the exploration methods and inappropriate management of the soil, the deforestation and unsuitable occupation of the urban soil, with urbanized areas pretty close to the main streams.

Most of the water used in Paraná is captured from surface water fountains; that is why it is so important the definition of the regulators mechanisms in order to turn compatible the use and occupation of the soil and the water quality.

Natural phenomena and the human action may threaten the preservation of the fountains, creating critical areas with immediate environmental risk in parts of the hydrographic basins.

On the last decades, the environmental changes have intensified all over the world. This issue goes through the industrial developing; the population rate increase that demands for more and more food, therefore, more agricultural production. Consequently, we can see generalized deforestation and environmental destruction, chiefly of the soil exposed to the erosive processes.

These studied areas have suffered environmental impacts intensified by the removal of the vegetation and intense agricultural activity, without any proper planting conservationist practices.

In the "New North" economical micro-region, where the study area is inserted, the deforestation started in 1930 until 1950 in order to open room for the coffee, which ruled the scenario until 1975. In some break in this period, there were many hoarfrost

and vermin attacks like the coffee tree rust, jeopardizing the coffee production, which were replaced by other cultures. During the 70 decade the internal politics turned to the eradication of the coffee trees replacing by soy, wheat, corn, cotton and the like. In the most dissected portions of the relief sculpted in the basalt between 1980-1985, it was observed the pastures increasing. The inappropriate management of the soil caused the condensation due the use of machinery causing erosive damages and silting up the rivers interfering in the water quality in the water sources. The intense out flowing of the rains in periods of intense rain, in areas of strong declivity has provoked erosive processes in the watersheds resulting into large ravines and a process of deep erosion forming huge landslides connected to the riverbanks of drainage. (Stipp & Oliveira, 2004).

Therefore, it was necessary to go to the evaluation process of the landscape and its fragility degree in the erosive processes, checking how the evolution and the adaptation of the system has been processed due the new conditions imposed by man.

The physical characterization of the two micro basins, was possible through the raising of some Bibliographic material and work field.

THEORETICAL FOUNDATION

For studying the hydrographic basins in order to make a planning study, it is necessary to be very attentive to the analysis scale involved, once the unit of planning demands at least one phase of implantation of the project and another, of monitoring and inspection of the results and implications. In order to make it easier the execution of several phases of work, it is possible to develop planning projects in Hydrographic basins smaller, which are called micro basins or sub basins (Botelho, 1999).

Therefore, the hydrographic basin, as a natural unit, integrating processes and receiver of the environmental impacts resulting of the man action, must be the subject of researches and measure programs, aiming the comprehension of its mechanisms and its functioning and preservation of its resources.

In this sense, a diagnosis methodology of the real situation of the natural resources in a specific hydrographic basin, turns to be a necessary instrument for preservation mainly the maintenance of water resources, soil and vegetation (BELTRAME, apud FERRETI,1998).

Aiming the sustained use of the natural resources in the agricultural activity, it is necessary to develop united actions, either the society or the public power, in an integrated management of the hydrographic micro basins, considered an ideal unit, either from the physical point of view or human point of view.

In Brazil, the initiative from the Federal government aiming the decrease of the damage in the agriculture, trying to recover the spoiled soil and the quality of water, is based in the principle of self support development through the implementation of the (PNMH) Programa Nacional de Microbacias Hidrográficas (National Program of Hydrographic Micro-basins), through a National law nº 94.076 de 05/03/1987.

The PNMH was thought to be supervised, in Federal level, through the Agriculture Ministry, the Municipalities and the States are supposed, through the committees, to execute it. The main actions within an integrated management to be concluded in micro basin level, according to Adur (1985) are:

- Municipal roads conservation;
- Erosive processes soil control;
- Recovering of the ciliary wood and to conserve indigenous wood;
- Introduction of new practices of management and proper fertilization in every different kind of soil and culture;
- To improve the water quality for the use of the farmers themselves;
- To diminish the use of agricultural defensives;
- To stimulate the foundation of cooperative associations;
- To stimulate the diversification of activities and,
- To fix the man in the field, opening and keeping the jobs.

GENERAL PURPOSES

The general purpose of this work, was concerned with a comparative analyses of the management systems of the soils from two micro hydrographic basins, checking the state of soil and its conservation as a way of preservation of the fountains and of the woods.

Despite these micro- basins are geographically close and are pretty much similar concerning the physical factors and biotic (soil, relief map, hydrographic, climate conditions and vegetation) concerning to the management system adopted by the farmers; they can present differences in how to use and management of the soil that enables different recommendations aiming the enhancing of the production process.

METHODOLOGICAL PROCEDURES

The studies began from a general previous rising of the characteristics of the natural frame of the region, as climate, geology, relief, soils and vegetation which was managed through bibliographic and cartographic accompanied by the field knowledge. Aiming to reach the proposed goals in this study, it was adopted an analysis of structure based on the following procedures:

- Elaboration of the environmental diagnosis of the two micro-basis;
- Regular Work field for system recognition of planting and soil conservation for erosion control;
- Mapping the micro-basins in the scale of 1:25.000, and the goal is to outstand their location in the municipalities of Londrina and Arapongas;
- Formal interviews, besides informal conversation with rural producers in the micro basins, the goal is to determine the influence of the human action over the elements like soil, water and vegetation, through the developing of the agricultural activity and the kind of adopted management.

PARTIAL RESULTS

From the recognition done in the field we may weave some reflection about the environmental impacts observed:

- The source of Ribeirão dos Apertados is choked, for it's located near a urban allotment, revealing flaws in the urban planning of the city of Arapongas;
- There is the predomination of white culture (soy, corn and wheat) and vegetable. These cultures come closer to the riverbanks without any inspection, while the environmental law, in this case, it forces the ciliary woods preservation 30 meters in each riverbank.

- It was observed in the production area of cattle raising, a process of erosion of the soil due the intensive use and lack of agricultural planning (modern techniques of sowing) causing silting up the rivers.
- Cattle raising in areas of larger declivity of the land, condensing the soil turning easier the superficial out flowing (turning into ravines, it might come to the base level, becoming a large hole as a result of a land sliding) consequently, some particles are carried into the river silting it up;
- In several intervals in both micro-basins the absence of ciliary wood was detected in this case, it is suggested according to environmental legislation, the reposition of the woods with indigenous species, besides a work of sensitize the farmers and larger inspection.

DISCUSSION ABOUT THE PARTIAL RESULTS

Due the environmental problems identified through the work field, we came to some considerations:

It prevails the necessity of recovering the sources of Ribeirão dos Apertados and Ribeirão Três Bocas, near the urban areas, with the reposition of the ciliary woods as fastest as possible.

As to the pollution originated in the agriculture activity, in order to avoid the soil defiling, from the surface and underground waters, there must be the controlled use of agriculture defensives, adopting the use of Biological Vermin Control, for example.

Since there is a soil spoiled due the human action and absences of conservationist practices, it is recommended modern techniques for preparing and sowing on the soil, aiming the erosion control: the adoption of Direct Planting System and Terracing.

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