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# **THE SOIL'S DEGRADATION IN THE MICROBASIN OF THE MAIOR RIVER, URUSSANGA-SC**

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## **INTRODUCTION**

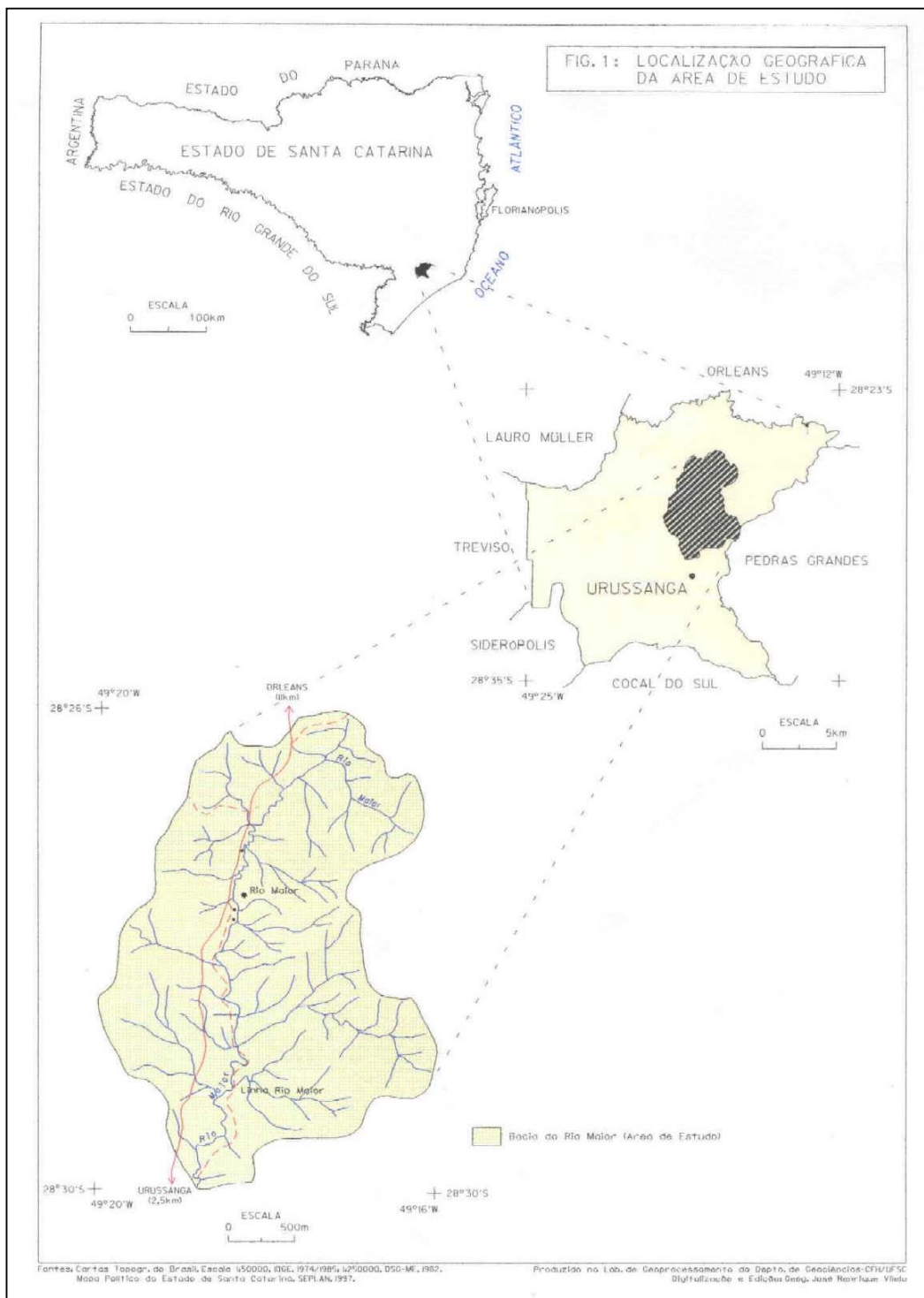
The southern region of Santa Catarina has been the subject of academic research since the nineties. A majority are related to the exploration of coal mines and its implication on the environmental degradation of the soils and hydric resources. The microbasin of the Maior River does not have favorable conditions for coal deposit to occur, even though it is included in the Geomorphologic Depressed Unit of the Carboniferous Zone of Santa Catarina. In this way, the deterioration of the in the Maior river is product of the relation between the society and nature. The an tropical alterations in the natural environment occurs in accordance with the physical characteristics of the place (climate, relief, vegetation, soil, as well as the socio-cultural level, technological capacity and the economic resources of the population (Ross,1992). It is in the natural environments where the human societies structure themselves; extract the resources for survival and organization of physical territorial space (op.cit). The environmental deterioration in the micro-basin of the Maior River has direct relation to the occupation and use of the land for cultural purposes since the end of the nineteenth century. The colonization of the region began with the establishment of a headquarters for the colony of Urussanga, on May 26<sup>th</sup> 1878 (Escaravaco, 1984). The residing population at Maior River is predominantly 3<sup>rd</sup> to 5<sup>th</sup> generation Italian descendants. The microbasin of the Maior River has two sites: The Maior river line and the Maior River. The first immigrants came from the mountainous region of northern Italy (Escaravaco, 1984).

## **OBJECTIVE**

To study the microbasin of the Maior River in its environmental components; analyzing the physical aspects, through the elaboration of thematic maps and the socio-economic characterization of the Maior river community. Elaboration of integrated maps, aimed at associating the physical aspects with the occupation and use of the land.

## **GEOGRAPHIC LOCATION OF THE STUDY AREA**

The micro-basin of the Maior River is located in the southern region of Santa Catarina. The geographic coordinates are: 28 ° 26 11 - 28° 30 29 latitude South and 49° 16 50 - 49° 20 00 longitude West of the Greenwich (fig. nº 1). The municipality of Urussanga has a territory of 237, 4 Km<sup>2</sup> with a population of 18.727 inhabitants, according to the IBGE census of 2000. The physical area of the micro-basin is 28 Km<sup>2</sup>, located to the north of the municipality of Urussanga. The extent of the Maior river is 11, 25 Km. the municipality of Urussanga has the following territorial limits: to the north Lauro Muller and Orleans; to the south Cocal do Sul; to the east Pedras Grandes, and to the west Lauro Muller, Siderópolis and Treviso (fig. nº 1).



## HISTORY OF THE RESEARCH IN THE MAIOR RIVER

In a research realized by Silva (1997) about the micro-basins of the Maior river, the author elaborated various maps, among them maps for the use of the soil (1957) and (1978) based on aerial photographs. On the map for the use of the soil (1996) elaborated with upgrades in field work. All the maps are on the scale 1:25 000. In the analysis of the maps of 1957, it is verified that secondary vegetation had (44, 0 %) and agriculture (43, 9 %). On the map for the use of soil for 1978, the area occupied with secondary vegetation increased to (56, 1 %) and

agriculture reduced to (32, 3 %). On the map for the use of soil for 1996, the areas with pasture dominated, with (57, 6 %), secondary vegetation (34,6 %) and agriculture with only (3,9 %) (Silva, 1997). Therefore in the period of almost forty years, the agricultural activity declined from 1978 until it arrived at a low percentage in 1996. Various factors contributed to the current state, some of which are, the control of a small rural property of about 10 hectares (40, 9 %) in 1995; the sharing up of the properties for inheritance (51, 4 %), rugged landscape with mostly hills and groups of small mounains; lacking the public policies for a small family farming property, mass departure from the rural area, diminishing of the soils natural fertility (Silva, 1997). At present, a general view of the micro-basin points to the territory for occupancy by secondary vegetation in diverse stages of ecological succession and the use of the land for pasture.

## **GEOLOGY**

The stratigraphy of the area researched is constructed by two distinct units: Pre –Cambrian lands of the “Suíte Intrusiva Pedras Grandes” and permeable sediments of the sedimentary covering Gonduânica (Paraná Basin), with the formation Sul River and Bonito River and intrusions from diabase for the General Mountain Range Formation (Silva, 1997). It also happens that alluvium sediments, of a sand-like type, un-solidified silted clay, deposited in flood plain, platforms and gutters of the rivers circuit (op. cit.). The Bonito River formation occupies vast areas in the Maior River.

## **MINERAL RESOURCES**

They are explored by mining companies, the white clay from the Bonito River Formation, the shale from Sul River Formation and the diabase from the General Mountain Range Formation, that happens locally in the form of “sill”, in the western region of the of the micro-basin. High quality clay is the principal primary material of the ceramic industry of southern Santa Catarina. The diabase is utilized as “brita”, destined to civil construction. The decomposition of the sill from diabase by weathering action and biological activity brings about soil of a reddish colour, with elevated iron content. They are fertile soil, but of limited occurrence and in function of the topography more active.

## **GEOMORPHOLOGY**

The microbasin of the Maior River integrates the Geo-morphologically Depressed Unit of the Carboniferous Zone of Santa Catarina, where the relief forms have the characteristics modulated, as many separations as accumulation. In general, the relief is hilly, with combined valleys, with smooth inclines. There is a thick layer that favors the occurrence of tropical solifluction and occasionally rapid movements, with added potential from human alterations in the natural environments. The modulation of separation in small mountains has contained valleys, consisting of elevated concave-convex, like hills. It is the modulation with fewer occurrences. The modulation of separation in hills presents vales little contained, open, with low altimetry altitude, approximately 100 meters; it's the modulation with the widest range in the area of study (fig. nº 2).

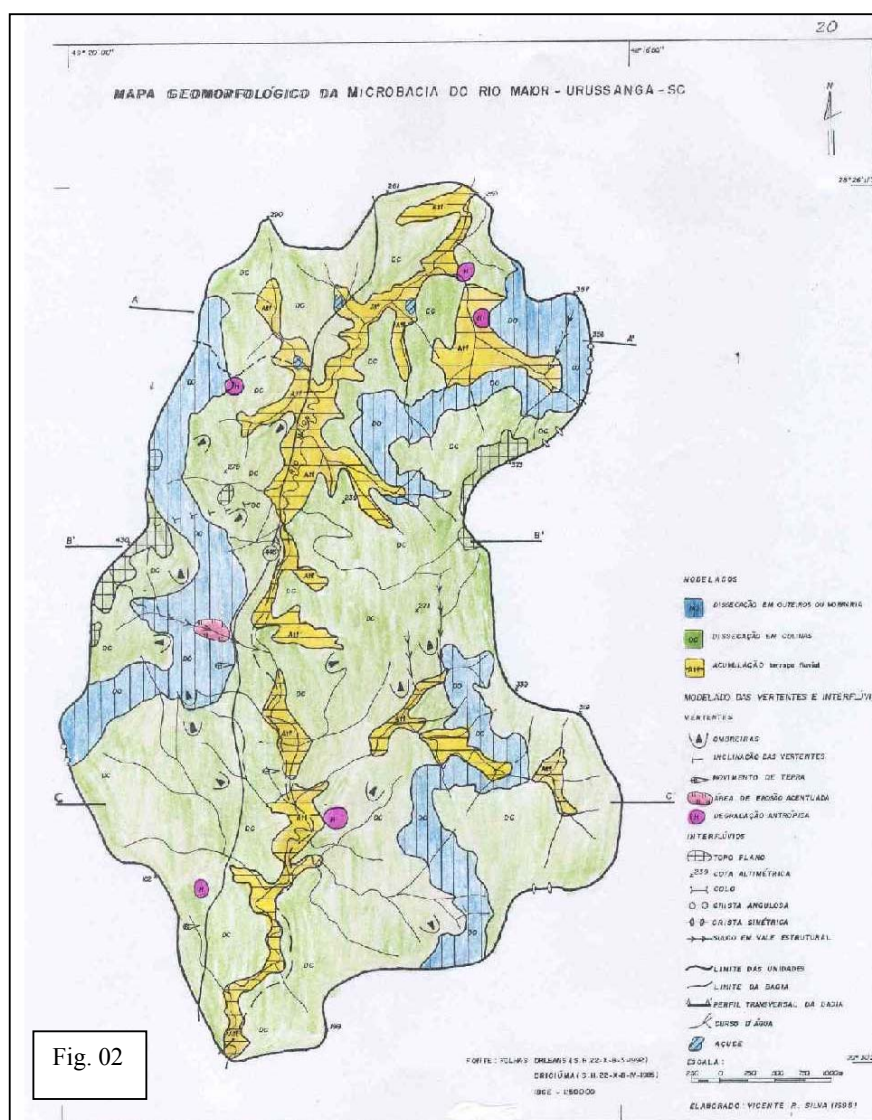


Fig. 02

## Land degradation

The areas degraded by clay mining shale's cause environmental alterations as the vegetable retraction, changes in the land's topography, with the formation of waste deposits and cavity, forming small lakes. The horizons of the soils are modified. One of the mines is located to the northeast of the micro-basin, next to the source of the Maior River. This activity facilitates the passing of fine sediments in the drainage canals, contributing to its increase. Clay extraction could compromise the quality of the water at the Maior River; in fact it is the same water that is used by SAMAE of Urussanga as its source. The company Cominas would be responsible for the environmental recuperation, after the closure of the mines. Nevertheless, in the mining of shale, already deactivated, the "environmental recuperation" was the planting of exotic species of eucalyptus and pines.

In the Maior River, the human alterations provoked long term alterations. (...) the natural processes, such as, the soils formation, lye, erosion, landslides, modifications of the hydraulic regime and vegetal coverage that occur in the natural environments, still without human intervention. However, when man deforests, plants, builds, transforms the environment, these processes called natural, tend to occur with more intensity (...) (Cunha; Guerra, 1996, p. 344). In the rural areas of the Maior River there are problems caused by land use, where the natural resources are utilized without knowing its fragilities, increasing the potential of the action of the erosion process. Therefore, the same natural conditions can, along with inadequate management, accelerate degradation, through laminar erosions, ravines and gully (Cunha; Guerra, 1996, p.347).

They were cartographed on the geomorphologic map (unedited) (fig.nº2), areas of emphasized erosion, an-tropical degradation and land movement. On the integrated map of the physical and socio-economic elements (unedited) (fig.nº3), were the degraded areas on a scale of 1:25 000.

The presence of pasture areas close to the rural houses is a tradition inherited from the ancestors who came from Italy. The use of the pasture land is in locations where the relief presents forms of separated hills. The existence of compact land areas "terraces" provoked by the excessive stepping of the cattle is common in the micro-basin. The reduction in agriculture favoured the diminishing of the erosion, seen by the presence of erosive "paleocicatizes", "fitoestabilizadas" in the landscape. The pasture in various stretches of the Maior River and its tributaries occupy the space until the margin of the course of the water,



favouring erosive processes by the absence of gallery forests , in disaccord with the Brazilian Forestall Code. (fig. nº 2, nº 3).

The environmental question needs and integrated vision of the natural resources and its rational utilization. The use of the natural resources must keep in mind the potentiality and fragility of the environmental systems, with the objective of making better the living conditions of the population.

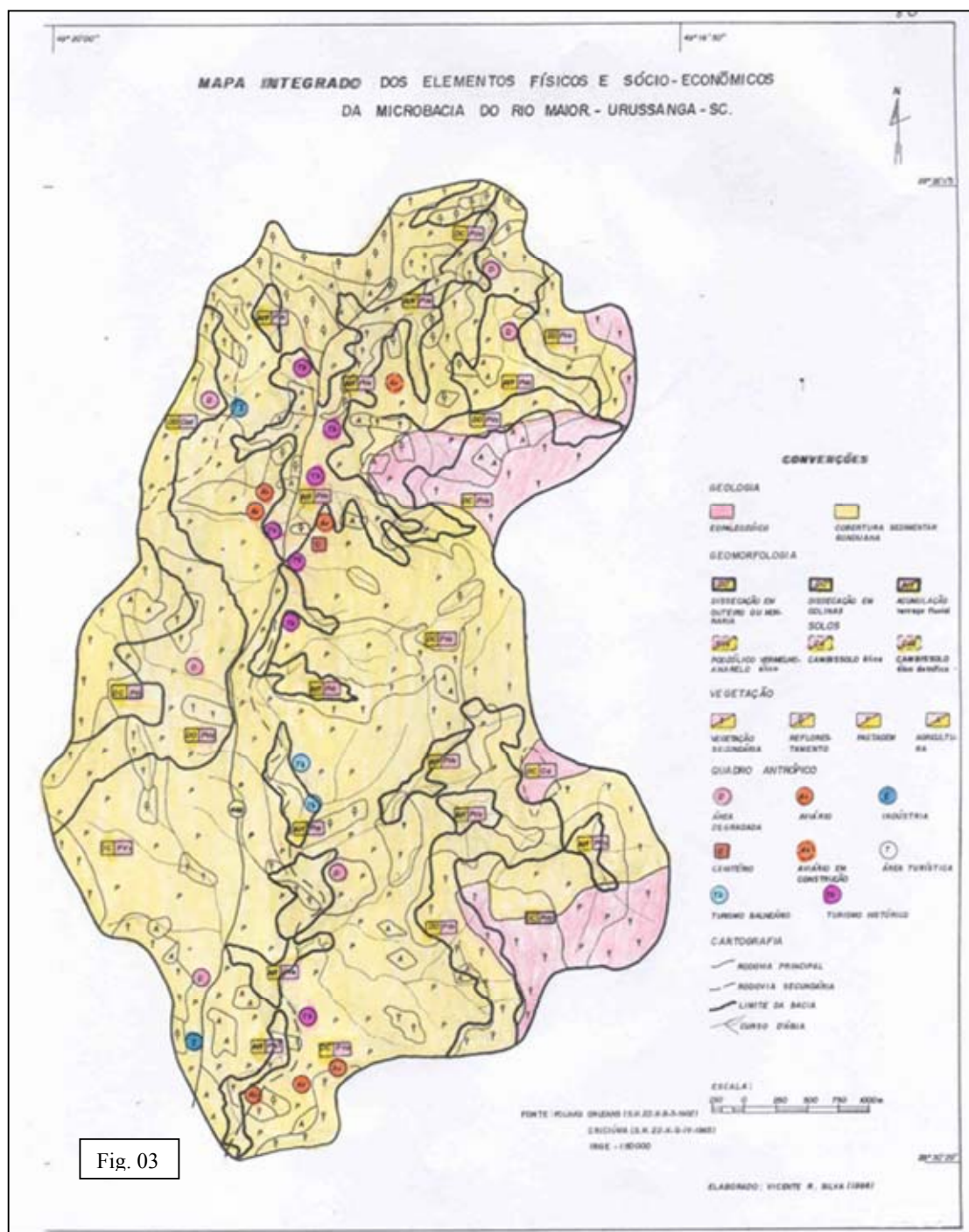


Fig. 03



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