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Technical Report - GEOGRAPHY MAPPING

SOCIO-ENVIRONMENTAL ANALYSIS AND PROPOSAL OF SUSTAINABLE MEASURES FOR THE SUB-BASIN OF THE BATOQUE RIVER, HIDROLÂNDIA-CE

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PRESENTATION:

The work in question aims at socio-environmental analysis and to develop proposals for sustainable measures for the sub-basin of the Batoque River, located in the municipality of Hidrolândia - CE, being located in the Northwest part of the State. The sub-basin corresponds to an area of 112.5 km², presenting an extensive planing area classified as sertaneja depression and river plain, with higher concentration of inselbergs in its high and medium course. The methodological basis was the systemic approach applied to geographic studies. Bibliographic, geocartographic and fieldwork surveys were carried out. Remote sensing was used as a basic tool, through the digital processing of Landsat 8 satellite images and SRTM radar images, for the elaboration of thematic maps and field visits, the matrix letters of SUDENE/DSG, SB.24-V-B-I (Santa Quitéria) and SB-24-V-B-IV (Monkfish) were used as support. An analysis and diagnosis of Geoenvironmental elements (geology, geomorphology, climate and water resources, soils, vegetation and fauna) was performed, as well as aspects that involve the process of land use and cover.

MATERIAL AND METHOD:

First, the entire territory of the sub-basin of the Batoque River was defined as a study area, starting from the upstream of the sub-basin to the downstream, which meets the drainage network of the Paulo Sarasate reservoir, including the tributaries of the Batoque River, which is one of the barred river courses. In order to elaborate a socio-environmental analysis with better detail, the places occupied by the riverside population in the area surrounding the sub-basin of the Batoque River were quantified, as well as the entire municipal head office of the municipality of Hidrolândia, a privileged municipality with the entire research area, conducting surveys of economic and social aspects, as well as cultural aspects. Through this procedure, it was intended to research the existing use and coverage, performing a retrospective from the beginning of the settlement process to the present day. The area under study presents different types of landscapes existing in the semi-arid state of Ceará, which will be made available through recent images.

CARTOGRAPHIC MATERIALS, EQUIPMENT AND SOFTWARE USED:

The cartographic and bibliographic review on the subject addressed was guided by consultations with printed books, digitized and various electronic journals, theses, dissertations and websites. Also in the understanding of the Geosystemic Theory, where one obtains the perception of the bond of natural factors, being possible to understand the socio-environmental vulnerability and the interconnection present in a given landscape.

Thus, a collection of data on the environmental, socioeconomic and historical aspects of the municipality of Hidrolândia, where the sub-basin is inserted, was organized. To obtain cartographic material, such as satellite images and cartographic bases, some agencies, such as the Mineral Resources Research Company (CPRM), were used; National Department of Transport Infrastructure (DNIT); Brazilian Institute of Geography and Statistics (IBGE); Institute of Research and Economic Strategy of Ceará (IPECE); Ceará´s Meteorological Foundation (FUNCEME); Water Resources Management Company (COGERH); United States Geological Survey (USGS).

• SUDENE/DGS topographic charts, in the range of 1:100,000;

• Geological map of the state of Ceará (CPRM, 2005) in the scale of 1:500,000;

• SRTM (Shuttle Radar Topography Mission) images on the scale of 1:250,000 collected on the Brazil Embossed website;

• Rainfall images of temporal analysis;

Equipment

• Lenovo notebook, with Intel core i3 processor;

• Garmin Etrex GPS;

• LG K50S phone;

• Hammer (for adequacy of soil profiles);

• Measuring tapes;

• Clipboard, pencil, eraser and pens.

Software used

• Google Earth;

• QUANTUM GIS (QGIS); Version 2.8; free software;

• Paint, windows' native program.

Historical and socioeconomic materials

• Municipal demographic censuses between 2009 and 2019, available on the IBGE website.

FINDINGS:

Two maps will be displayed. The first location of the research area and the second Use and Occupation of the sub-basin of the Batoque Ceará River.

LOCATION:

The reference project aims to make a socio-environmental analysis and propose sustainable measures for the sub-basin of the Batoque River, which is inserted in the Acaraú hydrographic basin. The sub-basin belongs entirely to the municipality of Hidrolândia, with an area of 112.5 km², in an environment of geomorphological compartmentalization classified as country depression and river plain.

The Batoque River is barred along its longitudinal profile in its low course by the Dam of the Paulo Sarasate Dam (Araras Dam), where it meets the main river of its basin, the Acaraú, being quite significant for local communities from the economic and social point of view, through cultivation by subsistence agriculture, both in the areas surrounding the dam, as well as on the banks of the river. Cultural and economic activities can be mentioned, such as the planting of corn and beans, predominantly, and the practice of artisanal fishing, which is directed to consumption, having its surplus marketed only in the locality.

The sub-basin of the Batoque River is located in the west of the state of Ceará, located in the charts of SUDENE/DSG, SB.24-V-B-I (Santa Quitéria) and SB-24-V-B-IV (Monkfish), belonging to the hydrographic system of the Acaraú basin. The sub-basin has its area inserted within the boundaries of the municipality of Hidrolândia. In its medium course, the Batoque River cuts through the urban perimeter of the city of Hidrolândia.

The study area is contemplated with specific characteristics of the semiarid region, which are strongly related in a system of integration of nature, where each particular aspect is relevant in the formation of the other. In the scenario of its geomorphological compartmentalization, it has landscapes with relief characterized by the surface of planing and river plains, located in the Northwest part of the state of Ceará, as shown in the map.

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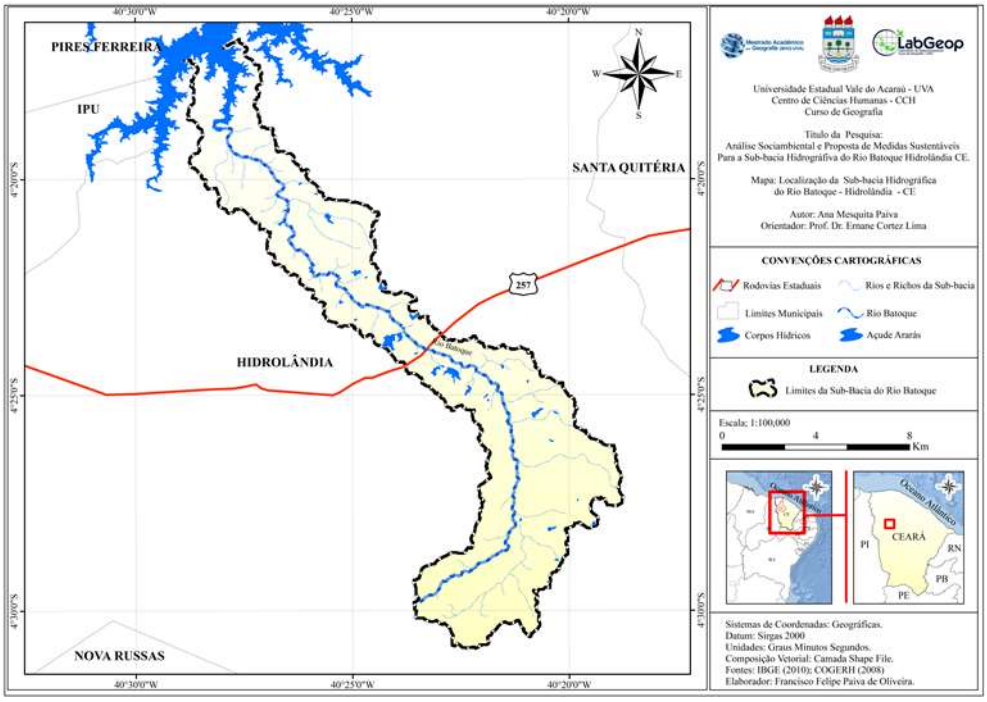
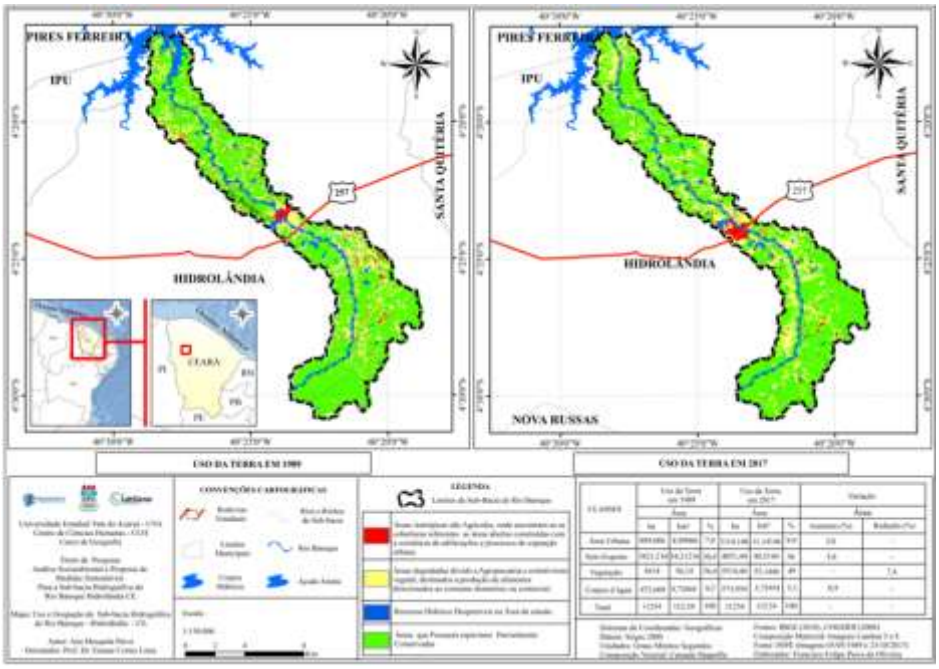
Location map of the Batoque river sub-basin, Hidrolândia-CE



Source: Mosque; Oliveira (2018).

MAP OF USE AND COVERAGE OF SECTORS: HIGH VALLEY OF THE BATOQUE RIVER AND SURFACE OF PLANING.

Figure 02- Map of Use and Coverage of the Batoque River Sub-Basin



Source: Mosque; Oliveira (2018).

FINAL CONSIDERATIONS:

This research was based on a socio-environmental study of the sub-basin of the Batoque River, Hidrolândia-CE, with the purpose of developing an environmental and social planning of the area, through proposals for sustainable measures.

In this dissertation are presented information about the collection of cabinet, geocartographic and field data carried out in the study area. Through the methodology and operational technical procedures adopted, it was possible to analyze and diagnose the natural and socioeconomic elements, trace the characteristics of morphological units through the taxonomy of relief and the hydrological characteristic through morph metric characterization.

With the systematization, description and analysis of geosystems and geosciences it was possible to highlight the natural physical characteristics, socioeconomic activities, potentialities and limitations and the main environmental impacts inherent to each geofaces. From this perspective, it was found that the area of the sub-basin of the Batoque River comprises a rich diversity in its physical-natural and socioeconomic environment, constituting a complex environmental degradation.

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