



ISSN: 2447-3359

REVISTA DE GEOCIÊNCIAS DO NORDESTE

Northeast Geosciences Journal

v. 6, n° 2 (2020)

<https://doi.org/10.21680/2447-3359.2020v6n2ID20536>



INTERPRETATION OF THE SEMIARID LANDSCAPE OF THE STATE OF PIAUÍ: FIELD PRACTICE IN THE CITIES OF PRATA DO PIAUÍ AND CIDADE DE PEDRAS

Francisco Wellington de Araujo Sousa¹; Géssica Maria Mesquita Monteiro Costa²; Glécia Maria de Carvalho Sousa³; Iracilde Maria de Moura Fé Lima⁴

¹Master in Geography, Postgraduate Program in Geography, Federal University of Piauí (UFPI), Teresina/PI, Brazil.

ORCID: <https://orcid.org/0000-0003-2667-3206>

Email: wellingtongeo88@gmail.com

²Master's student in Geography, Postgraduate Program in Geography, Federal University of Piauí (UFPI), Teresina/PI, Brazil.

ORCID: <https://orcid.org/0000-0002-1258-5953>

Email: gessicamonteiro.alima@gmail.com

³Master's student in Geography, Postgraduate Program in Geography, Federal University of Piauí (UFPI), Teresina/PI, Brazil.

ORCID: <https://orcid.org/0000-0001-9533-246X>

Email: gleciacarvalho@gmail.com

⁴PhD in Geography, Postgraduate Program in Geography, Federal University of Piauí (UFPI), Teresina/PI, Brazil.

ORCID: <https://orcid.org/0000-0003-3936-180X>

Email: iracildemourafelima@gmail.com

Abstract

This article aims to characterize the landscapes of stretches visited in field activities in Prata do Piauí and Cidade de Pedras, trying to identify their suitability, or not, to the classification of semi-arid spaces, based on the criteria of climatic types and vegetation cover used by the literature to define the Brazilian semiarid region. The methodological procedures were based on the dialectical approach that started with the discussion in the classroom, at the moment of articulation of the observation scripts in the towns mentioned. During the fieldwork, the descriptive-exploratory character was

used by means of maps, filling in forms, using the Global Positioning System (GPS) and camera. In the laboratory, Qgis software was used to analyse collected data and information. In order to achieve the proposed objective, geoenvironmental characterization and comparative observation were carried out, as a subsidy to the analysis of local landscapes in relation to the conceptualization of a semi-arid environment.

Keywords: Landscape; Field activity; Semiarid.

INTERPRETAÇÃO DA PAISAGEM DO SEMIÁRIDO PIAUIENSE: PRÁTICA DE CAMPO NO MUNICÍPIO DE PRATA DO PIAUÍ E NA CIDADE DE PEDRAS

Resumo

O presente artigo teve como objetivo caracterizar as paisagens de trechos visitados nas atividades de campo, em Prata do Piauí e na Cidade de Pedras, buscando identificar sua adequação, ou não, à classificação de espaços semiáridos, a partir dos critérios de tipos climáticos e cobertura vegetal utilizado pela literatura para definir a região semiárida brasileira. Os procedimentos metodológicos foram embasados na abordagem dialética que teve início com a discussão em sala de aula, em momentos de articulação dos roteiros de observação nos municípios citados. Durante os trabalhos de campo utilizou-se do caráter descritivo-exploratório por meio de mapas, preenchimento de fichas, uso do aparelho *Global Positioning System* (GPS) e câmera fotográfica. Em laboratório fez-se uso do *software Qgis* para trabalhar os dados e informações levantados. Para alcançar o objetivo proposto, foi realizada a caracterização geoambiental e a observação de forma comparativa, como subsídio à análise das paisagens locais em relação à conceituação de ambiente semiárido.

Palavras-chave: Paisagem; Atividade de campo; Semiárido.

INTERPRETACIÓN DEL PAISAJE DEL SEMIÁRIDO EN PIAUÍ: PRÁCTICA DE CAMPO EN EL MUNICIPIO DE PRATA DO PIAUÍ Y EN LA CIDADE DE PEDRAS

Resumen

El presente artículo tiene como objetivo caracterizar los paisajes de trechos visitados en las actividades de campo en Prata do Piauí y en la Cidade de Pedras, buscando identificar su adecuación, o no, a la clasificación de los espacios semiáridos, a partir de los criterios de tipos climáticos y cubierta vegetal utilizados por la literatura para definir la región semiárida brasileña. Los procedimientos metodológicos fueron basados en el abordaje dialéctica que tuvo inicio con la discusión en el aula, en momentos de articulación de los itinerarios de observación en los municipios citados. Durante los trabajos de campo utilizó del carácter descriptivo exploratorio por medio de mapas, relleno de formularios, uso del aparato Global Positioning System (GPS) y cámara fotográfica. En laboratorio ha hecho uso del software Qgis para trabajar los datos e informaciones levantados. Para alcanzar el objetivo propuesto, fue realizada la caracterización geo ambiental y la observación de forma comparativa, como subsidio al análisis de los paisajes locales en relación a la conceptualización de ambiente semiárido.

Palabras-clave: Paisaje; Actividad de campo; Semiárido.

1. INTRODUCTION

The present study sought to reflect on the importance of using the methodology that unites theory and practice. In this understanding, the study of the landscape was approached from the field activity and classification of local landscapes, as it understands that they are relevant for teaching and learning in the disciplines that make up, mainly, the theme of Physical Geography.

According to Viana et al (2017), Geography as a science that studies space, involves its physical, human and social aspects, enables systematic, exploratory and investigative observation. Geographers such as Suertegaray (2002), Venturi (2005), Oliveira (2007) and Carneiro (2008) point to the need for field activities as a way to expand student learning, in order to exclude the barriers established by the limits of the classroom.

According to Azambuja (2012), the geographical space contains the landscape that is more comprehensive in identifying the process or the formation of the historical dimension, the past and the present of the spatial forms. The geographer / researcher, as Corrêa (1996) argues, instigated by field activities, must not only observe how the landscape is today, but also how it was formed and how far it was transformed or preserved.

In consonance with this discussion, the research aimed to carry out a comparative discussion of the landscapes of stretches observed in field activities in the cities of Prata do Piauí, Bocaina and São José do Piauí, a region known as Cidade de Pedras, both included in the Piauí semi-arid region.

2. LITERATURE REVIEW

2.1. Landscape, a conceptual discussion

The concept of landscape, as well as the other key concepts of Geography, is surrounded by controversies, however in geographic science this concept has, according to Souza (2013), traditionally, a more specific scope. For Geography, the study of the landscape,

since the genesis of his thought, has always represented an instigating and central challenge (ORTIGOZA, 2010).

In this way, the concept of landscape for many years was linked to the description. For George (1970), the landscape is defined as the portion of the geographic space analyzed visually. According to Dolfuss (1973), the landscape is composed of geographical elements that are related to each other and, thus, it is observed that the concept started to present an understanding of the systemic approach in the second half of the 20th century..

Bertrand (1972) defines landscape as a certain portion of the space resulting from the dynamic and unstable interaction of physical, biological and anthropic attributes that, reacting dialectically over each other, make it a unique and inseparable set.

For Christofolletti (1999), the landscape constitutes itself in the field of investigation where space must be understood as an environmental, physical and socioeconomic system, with structuring, functioning and dynamics of physical, biogeographic, social and economic elements. It is understood that the author brings the idea of elements in interaction and constant dynamization, so it is not simply a matter of adding geographic environments.

According to Passos (2001), analyzing the landscape from the historical point of view is fundamental, since it is not possible to deny the level of anthropic intervention. In expanding this discussion, Passos (2003) highlights that the landscape presents itself as a reflection of social organization and particular natural conditions.

The landscape is, therefore, a space in three dimensions: natural, social and historical. The natural dimension is the physical environment that provides the necessary elements in the construction of human relationships that results in the social landscape. The social landscape changes over time, presenting itself as a witness to "a history written by processes of the past and the present" (SANTOS, 2002, p. 153).

Thomas (2001) and Camargo (2002), affirm that the dynamics of the landscape is a function of the interaction between the factors, where any altered component modifies the system as a whole.

In this way, Schier (2003) comments that the study of the landscape requires an integrated approach from which it is intended to make an assessment defining the set of elements involved, where scale and temporality come to be considered in the landscape. It is learned that "the landscape is always constituted by a combination of "natural objects" and "social objects" (SANTOS, 2004, p. 53).

The landscape is established as a result of an interrelation between nature and man, as nature is transformed by human beings who start to organize themselves in society in this appropriate geographical space (SILVA, 2012).

According to Ortigoza (2010), the landscape is the most immediate and momentary materialization of social life, therefore, it needs to be understood in the context of everyday life, and representations of nature and their meanings. The landscape is, therefore, a diagonal, transdisciplinary notion that allows socio-spatial articulation (RODRIGUEZ; SILVA, 2002).

Based on the various readings on the concept of landscape, there is, thus, an evolution in the form of the conception and analysis of this term, of its description or even of its classification by geographers. The concept is more complex and an analytical

observation is necessary, taking into account the context in which the analysis and applicability refer to. It must be also considered that the dynamics of the landscape is not the individual evolution of the elements that compose it, but rather an evolution through the interaction between all its elements, which reproduce three-dimensionally in a state (BERTRAND; TRICART, 1968, p. 261).

2.2. Landscape and semiarid environment

For Lima and Abreu (2007) most of the studies related to the semiarid environment consider the semi-arid climate as a definer element of the regional space, where it rains an average of 800 millimeters per year, or less. This region consists of a group of cities that have a semi-arid climate, extending over more than half of the Northeast and a small part of the state of Minas Gerais (LIMA; ABREU, 2007).

The Brazilian semiarid region presents, in a singular way, strong insolation, relatively high annual temperatures and an irregular and scarce rainfall regime, with rainfall distributed over a short period, from three to four months, with insufficient water volumes in its sources for needs of the population (SILVA *et al.*, 2009).

At different times, there was a need to discuss and redefine the delimited area as a semi-arid region, based on a review of the criteria used for its demarcation. Thus, since the first delimitations dated to the 1930s (LIMA; ABREU, 2007; CARVALHO, 2017), until today there have been changes in the area's extension, within the limits established for it, as well as criticisms in relation to the insufficiency of using only the criterion of pluviometric precipitation as exclusive for the selection of the inserted cities (BRASIL, 2005).

Historically, it can be seen that the first attempt to establish the official setting of the Brazilian semi-arid was based on the Polígono das Secas (CARVALHO, 2017) created by Law 175, of January 7, 1936 (BRAZIL, 1936) and being complemented by Decree-Law 9857, of September 13, 1946 (BRASIL, 1946) which the government defined as an area of intense droughts, according to Lima and Abreu (2007).

This delimitation of the Brazilian semiarid region has changed since the 1930s when the Brazilian government, who was concerned with the population that suffered from the effects of droughts, defined an area with the name of Polígono das Secas, as stated by RELFG (s / d):

Law 175/36 of January 7, 1936 (revised in 1951 by Law 1.348) recognized the Polígono das Secas as the area of Northeastern Brazil composed of different geographical areas with different aridity rates and submitted to repeated crises of prolonged droughts.

In the 1980s, new studies were carried out in the semi-arid region by several specialists to better understanding and redefinition of the semi-arid area of the Northeast, no longer considering only the amount of rainfall as the area's boundary, but also other elements of nature, such as vegetation (LIMA; ABREU, 2007).

According to IBGE (2014), the redelimitation of the semi-arid region and the cities included in this area was made in 1994 by Resolution no. 10,929, of 7/30/1999, and updated by

Administrative Rule no. 1,181, from 1995 (both from the former SUDENE-Northeast Development Superintendence), which was extinguished in 2001, then, the Ministry of National Integration assumed the responsibility of attribution of taking a position on the claims for inclusion of cities in the semiarid region of Brazil (CARVALHO, 2017).

Despite the improvements provided by investments in the semiarid region to combat drought, the situation did not change much in relation to the quality of life of the population, because the droughts persisted, making life difficult for the population in the area. Therefore, other studies were carried out in the areas by several specialists who reviewed the delimitation criteria (CARVALHO, 2017).

According to Carvalho (2017), only the accumulated knowledge about the climate proved insufficient to understand the lack of water in the semi-arid region, since its poor distribution, associated with a high rate of evapotranspiration, results in the drought phenomenon that periodically afflicts the population of the region. Thus, there is an inadequacy of the criterion adopted since 1989, which took into account only the average annual rainfall of the cities in that region.

According to Lima and Abreu (2007), in 2005 the Ministry of National Integration defined a new semi-arid space formed by a total of 1,113 cities. 1,048 of these cities belong to the states of the Northeast region, except Maranhão, and 85 belong to the state of Minas Gerais. All of them are benefited from the resources of the Constitutional Financing Fund of the Northeast (FNE), as can be seen in figure 1 (A and B).

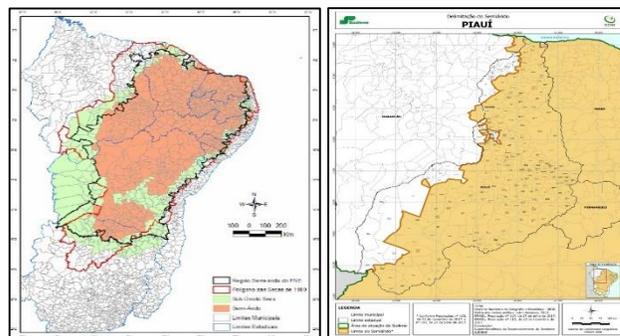


Figure 1 - Maps that highlight the semi-arid region. In: A - semi-arid region of Brazil, in 2005; B - New delimitation of the semi-arid region of Brazil, highlighting part of the States of Piauí and Maranhão, in 2017. Source: A - Ministry of State for National Integration - Ordinance No. 89 of March 16, 2005, cited by Lima and Abreu (2007); B - BRAZIL (2017).

The studies that supported this delimitation in Piauí took into account not only the rainfall and vegetation cover, but also other indicators that reflect the moisture retained (or not) in the environment, such as relief, hydrography, soils and vegetation, associated with the socioeconomic conditions of the cities. The indicators used by the study that supported the formulation of the mentioned Decree “generated lines defining the limits of nuances of semi-aridity or semi-arid conditions for subunits. Based on these definitions, socioeconomic studies were carried out, whose database was the political-administrative division at the municipal

level "(LIMA: ABREU, 2000). Thus, the environments were classified into three sub-regions:

I - ENVIRONMENTAL INDICATORS a) sub-region B - semi-arid: • climate - dry condition, semi-arid climatic type, presenting a probability greater than 75% than the annual rainfall index is less than 900mm and having 2 to 3 months favorable to the occurrence of rains;

• vegetation - exclusive presence of caatingas, with tree and / or shrub strata. b) Sub-region C - semi-arid transition: In the case of a transition area, other indicators were adopted, in addition to climate and vegetation, to delimit this sub-region:

• climate - transition condition, semi-arid transition climate type, presenting itself with a probability higher than 75% of the annual rainfall index is down 900mm and having 4 or more months favorable to the occurrence of rains;

• vegetation - presence of caatingas with associations, and sometimes the caatinga is associated with the cerrado, sometimes with the cerrado and palm forest, with patches of degradation of the vegetation cover;

• soils - occurrence of extremely sandy soils and poor in nutrients, with poorly drained patches or covered by concretions, rocky outcrops or associated with intense anthropic actions.

• Relief - limit of the 500m altitude curve, as it corresponds to the contact between the semi-arid sub-regions and a sub-humid transition "island" (enclave) with a predominance of cerrado;

• hydrography - limit that separates perennial drainage from temporary drainage between the semi-arid and sub-humid transition subregions.

II- SOCIO-ECONOMIC INDICATORS • Indicators related to the population and its dynamics, economic activities and the insertion of the population in the job market were collected and analyzed based on data standardized by IBGE with reference to the municipal political-administrative division (LIMA ; ABREU, 2000, p.3).

As a result, the mapping showed that two environmental conditions delimited the Piauí semi-arid domain, compartmentalizing into two units called Semi-Arid Sub-Region and Semi-Arid Transition Sub-Region. The study of the socioeconomic conditions of these sub-regions reveals a certain pattern of homogeneity between them, not allowing significant differences to be established between these environmental sub-regions, which reinforces that the expression of the difference in the state's development conditions is historically defined between the North and South of Piauí (LIMA; ABREU, 2000) (Figure 2).

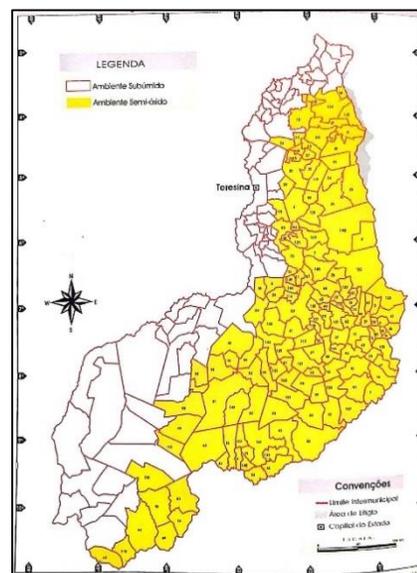


Figure 2 - Map of the Semi-Arid Environment of the State of Piauí. Source: Lima and Abreu (2004)

3. MATERIALS AND METHODS

Field activity 1 was organized in two moments, the first was in the classroom of the discipline Integrated Environment Analysis, of the Master's course in Geography at the Federal University of Piauí (PPGGEO-UFPI) with readings for the recognition of the area, planning of the points that were visited and the elements that were analyzed. Possible paths of discussion and authors were also identified to support the research; the second moment comprised the realization of the field, culminating with the observations and analysis of the biophysical characteristics (geology, elements of the climate, relief, hydrography, soils and vegetation).

As for the field activity 2, this constituted a practice of the discipline Environmental analysis (Geomorphology II) of the undergraduate course in Geography at UFPI. As stages of organization for the field, a survey of the location of the region, and works carried out on the place and the guidelines elements of the observation were done in home office. The post-field was articulated with those involved in the research, references and the central points of the discussion.

The analysis area in field 1 comprised the city of Prata do Piauí, held from 02 to 04 December 2019, with the central point of its route being the meeting of the Sambito River with the Poti River, in addition to landscapes of its surroundings. Field II was held on January 18, 2020 in Cidade de Pedras, popularly known as Capadocia Nordestina, located in the city of Bocaina, on the border with São José do Piauí. Figure 3 shows the location map of the visited cities.

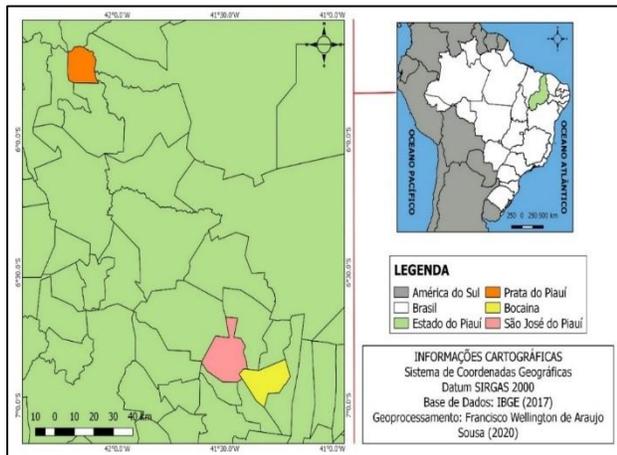


Figure 3 - Location Map of the visited cities. Database: IBGE (2017). Organization: The authors (2020).

In the two field works, the biophysical elements and their relationship with land use and the respective data collection were observed, by filling out forms to guide the observation of landscapes in a systematic and comparative way, as well as some aspects of the dynamics of local landscapes.

The instruments used were the GPS (Global Positioning System) equipment, as a means of marking the geographical coordinates of the observation points and later use in the elaboration of the maps of the analysis areas, as well as a photographic camera for recording the landscape.

The entire mapping was developed using the Qgis software free version 2.18.10, with the geocentric Reference System for the Americas being adopted as a geodetic reference (SIRGAS 2000). The cartographic base was built based on the download of vector data from the Brazilian Institute of Geography and Statistics (2017).

As for the theoretical-methodological contribution, the concepts used in this work were those of landscape and field activity, within the perspective of Bertrand (1971), Passos (2001, 2003) and Azambuja (2012). Regarding the understanding of the relationship between landscape and semi-arid environment, the discussion was based among the authors by Carvalho (2017) and Lima and Abreu (2007) and regarding the current definition of the Piauí semi-arid and the definition of delimitation, it was used BRAZIL (2005) and studies by Lima, Abreu and Lima (2000).

4. RESULTS AND DISCUSSION

4.1. Geoenvironmental Characterization of the cities of Prata do Piauí and Cidade de Pedras

Prata do Piauí is a city located in the microregion of Valença do Piauí, bordering the cities Alto Longá and the north of São Miguel do Tapuio; to the south with São Felix do Piauí and São Miguel da Baixa Grande; to the west with Beneditinos and to the east with Santa Cruz dos Milagres (IBGE, 1990). Cidade de Pedras is located on the border of São José do Piauí and Bocaina cities, both belong to the Intermediate Geographic Region of Picos.

As for the biophysical aspects, the geological basis of these two areas corresponds to the sedimentary formations of the Parnaíba Sedimentary Basin, and in the area where Prata do Piauí is located emerges formations such as Piauí, Poti (Carboniferous Period) Corda and Pastos Bons (Jurassic Period), while Cidade de Pedras is based on the Head formation of Devonian age, as well as detritus-lateritic coverings dated from the Tertiary.

When considering the characterization of the semi-arid region of Piauí space, according to Lima, Abreu and Lima (2000), the city of Prata do Piauí is located in sub-region C - semi-arid transition. In this characterization, environmental indicators were considered, such as climate and vegetation. In this sense, it is reported that these are areas of the semi-arid transition climate type, with rainfall rates below 900 mm, presenting 4 or more months favorable to the occurrence of rains.

These climatic characteristics are in consonance with the hot tropical climate, highlighted by Aguiar and Gomes (2004). With regard to vegetation, Lima, Abreu and Lima (2000) affirm that sub-region C, presents caatingas associated with the cerrado and this one associated with the palm forest.

As for the Cidade de Pedras region, it is located in sub-region B - semi-arid, with a dry climate, with the semi-arid as its climatic type. Therefore, it presents annual pluviometric indexes inferior to 900 mm, with 2 to 3 months favorable to the occurrence of rains. Thus, as an influence of climatic conditions, the vegetation of the region is predominantly characterized by the caatinga, with tree and / or shrub strata (LIMA; ABREU; LIMA, 2000).

The soils of Prata do Piauí are characterized by being litolic, alic and dystrophic, poorly developed, shallow in a stony phase, with deciduous forest and in some sub-deciduous stretches with variations for semi-arid. It is also inferred the occurrence of red-yellow podzolic soils with the presence of clay, and vegetal transitions from sub-deciduous and caatinga forests, and some stretches they presents sandy soils (AGUIAR; GOMES, 2004).

With regard to the soils that characterize the area of Cidade de Pedras, these come from altering of the conglomerate, sandstones, siltstones and shales. They comprise litolic, dystrophic soils, of medium texture, few developed, shallow to very shallow, very stony. There, occur also yellow dystrophic Oxisols, which have low fertility, are quite hard, in addition to being deep and uniform in terms of color and texture (EMBRAPA, 2014).

As for the vegetation aspects, the phytocological units, which occur in the city of Prata do Piauí according to RADAMBRASIL (1973) correspond to Savana Arborizada (Cerrado) and Savana Estépica (Caatinga). Thus, what is exposed by RADAMBRASIL (1973) as for the vegetation characteristics corroborates the definition of the Piauí semi-arid made by the authors Lima, Abreu and Lima (2000) who argues that the city of Prata do Piauí is located in sub-region C - semi-arid transition, where in the landscape it is possible to identify cerrado and caatinga.

Regarding the Cidade de Pedras, there are Savana Estépica Arborizada and Savana Estépica Florestada (RADAMBRASIL, 1973). Comprising sub-region B - semi-arid (LIMA; ABREU; LIMA, 2000), with a landscape marked by caatinga vegetation.

Savana Estépica Florestada is characterized by the presence of species that reach great heights, with an average of 5 m, exceptionally exceeding 7 m in height, with more or less dense physiognomy, with thick trunks and very branched shredding. The Savanna Estépica Arborizada, on the other hand, has the same

characteristics as the Savana Estépica Florestada, however, the difference is related to the canopy, because the species are shorter (IBGE, 1992).

4.2. Field activity 1: city of Prata do Piauí and junction of Sambito and Poti rivers

From the point of view of geology, there was the presence of the Poti formation, composed of sandstones, shales and siltstones that are outcropping over vast stretches of the northern area of the city of Prata do Piauí. These rocks are under mechanical disintegration processes, predominantly, observed on the slopes and tops of residual hills and low plateaus, indicating a predominance of morphogenesis.

With regard to drainage, its northern boundary is formed by Poti, a regional river that receives its affluent, the Sambito river, which forms the eastern boundary from north to south of this city. It is highlighted that in this city the Poti River has its perennial flow regime, where it forms limit between the medium and low route of this river (LIMA, 2020) and that a large part of the Sambito River also has its perennial route, although several local affluents are on a temporary basis, as shown in the photos in Figure 4.

On the bank of the small affluent of the Sambito River, near the crossing to a community in the neighboring of Prata do Piauí, São Miguel do Tapuio, for example, layers of conserved rocks were observed between thin strata of decomposed rocks, in a process of marked erosion, notably on its left bank, while on its right bank there is the presence of accumulation of river sediments.

Regarding the flow of the Poti River, it was also observed that it is supplied in Prata do Piauí not only by rainwater, but also by small streams, from the constant “water eyes” supply, which drain directly into this river, some of which are used by local population.

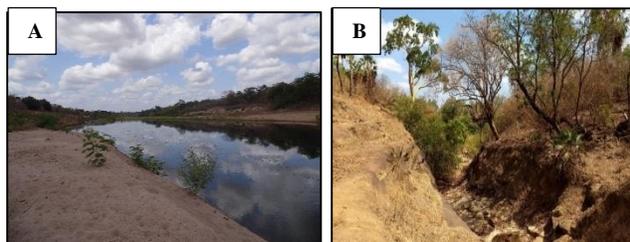


Figure 4 - Photographs highlighting: in A - Poti river bed with low flow and large alluvial deposit in its bed; and in B - dry bed of temporary stream, an affluent of the Sambito River. Source: Photos of the authors (Dec. 2019)

As for the soils observed, the presence of bare environments was found, with a predominance of rocky outcrops and rarefied vegetation, these aspects are characteristic of the Litolitic Neosols or even the absence of soils. Most of the vegetation in the area observed is dry, with shrub bearing with a significant presence of carnaubas (*Copernicia prunifera*) in the drier areas (Figure 5) and babaçu (*Attalea speciosa*), being that in the most humid areas there is cerrado sometimes arboreal, sometimes shrubby, which interspersed with babaçu, mainly in the vicinity of the Poti river bed and some stretches of the Sambito river. Environments with

these characteristics have a predominance of morphogenetic processes, with great performance from physical weathering.



Figure 5 - Photograph highlighting an environment with bare soil, shrub vegetation and rocky outcrop in the valley of an affluent of the Sambito River, in Prata do Piauí. Source: Costa (Dec. 2019).

The presence of alternating patches was also observed as bands of transition from sub-humid to semi-arid climate, with emphasis on babaçu interspersed in perennial species and cacti, with xerophilous species, plants that are typical of a semi-arid environment. Figure 6 (A, B, C) highlights photographs of these types of vegetation that are interspersed in the city of Prata do Piauí: in A - arboreal / shrubby vegetation with babaçu; in B - caatinga with cacti; and in C - shrubby vegetation with carnaubal. These conditions allow us to affirm that the area of this city is in a transition band between the biomes of caatinga, cerrado and cocais forest, forming, therefore, a transition area.

It was observed that the vegetation appears more dense, mixed with palm trees on both banks of the rivers, although predominantly small, with several anthropized stretches. It was revealed in these stretches shrubby vegetation, shrubby vegetation with cactus and species of Carnauba and palm trees. It is possible to observe mixed vegetation characteristic of a transition area, with the presence of cerrado vegetation and traces of the caatinga, as shown in Figure 6 (RADAMBRASIL, 1973); (LIMA; ABREU; LIMA, 2000).

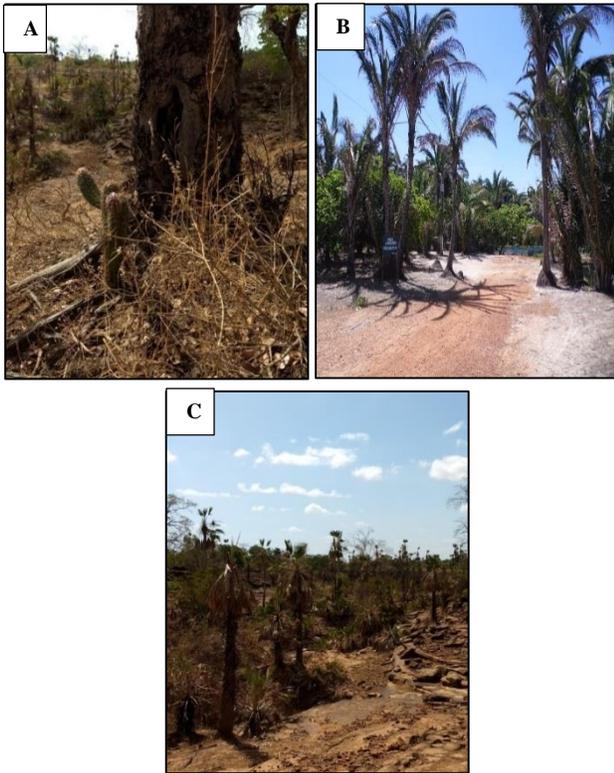
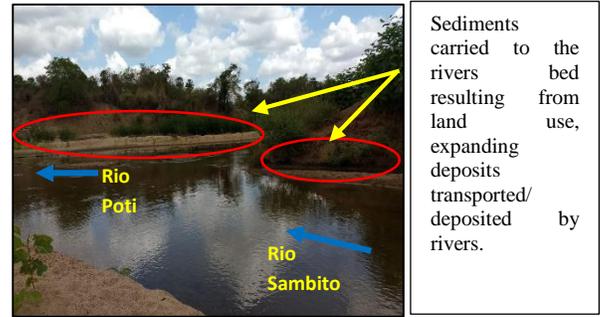


Figure 6 - Photos that highlight vegetation characteristics in the area of Prata do Piauí. In: A - tree / shrub vegetation with babaçu; B - shrubby vegetation with cactaceae; C - shrubby vegetation with Carnauba. Source: Authors (Dec. 2019).

In relation to land use, in the area close to the junction of the Sambito and Poti rivers, an intense use of the land was identified, inferred by the presence of cattle, goats, pigs and fences in the alluvial deposits, which goes down through the slopes and crosses the riverbed, it is used both for pasture and for the cultivation of watermelon, corn and beans, among other crops. It was also observed the presence of a wooden bridge that connects the two banks of the Sambito River, which allows access for frequent use of crossing, mainly by motorcycles, where it was noticed a great removal of sediments taken to the river bed Sambito River, as shown in Figure 7.



Sediments carried to the rivers bed resulting from land use, expanding deposits transported/deposited by rivers.

Figure 7 - Photograph highlighting the mouth of the Sambito River into Poti River and junction of the rivers Poti. Source: Authors (Dec. 2019).

Based on figures 7 and 8, it is observed that near the beds of the Sambito and Poti rivers, alluvial deposits (carried by the rivers) are formed and that they are amplified by carrying sediments from their banks to their beds by using of the area by constituting an access path to the neighboring city of São Miguel do Tapuio by a wooden bridge (Figure 8 A), in addition to animal husbandry. These are inferred by the presence of fences that go down through slopes and cross the beds of these rivers (Figure 8 B), mainly the Poti river. All these elements and aspects are clearly visible in the landscape.

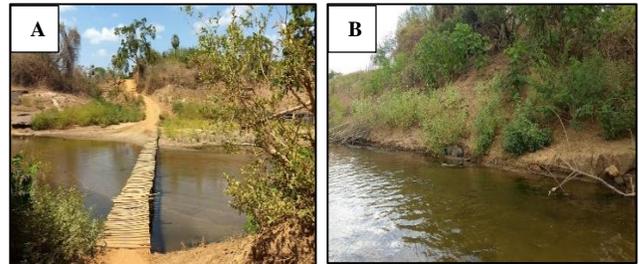


Figure 8 - Photos highlighting: A - Wooden bridge connecting the cities of Prata and São Miguel do Tapuio; B - Fences down through the slope and across the Sambito River. Source: Costa (Dec. 2019).

4.3. Field Activity 2: Landscape of the área of Cidade de Pedras.

The landscape of Cidade de Pedras is characterized in terms of lithology by the Head formation. This geological unit has a predominance of outcrops of grayish and silicified sandstones in the observed area. From the point of view of geomorphology, relief forms such as plateaus, tables and plateaus were found in the region, as well as ruiniform reliefs of the pinnacle and tower types. Ruiniform features are predominant in the observed points, presenting a variety of sculpted shapes due to the pluvium-wind erosion processes. Figure 9 highlights these landforms found in the region, resulting from differential erosion.



Figure 9 - Photograph showing landforms in the Cidade de Pedras area. Source: Costa (Jan. 2020).

It is noteworthy that the geological-geomorphological richness of the region reveals a peculiarity in the semi-arid landscape of Piauí, being an area with great geotouristic potential, due to the scenic beauty of the landforms (figure 10 A) and the scientific relevance that the region presents (SILVA, 2017). Also noteworthy of the importance of the site with regard to the archaeological remains (cave paintings) that are found in the area (figure 10 B).



Figure 10 - Photos that highlight the geological-geomorphological and archaeological heritage in the Cidade de Pedras area. In A - Ruiniiform features; and in B - Rock paintings. Source: Sousa (Jan. 2020).

In this area there are temporary rivers in the hydrographic basin of the Canindé River, far from the river beds and, thus, it remains with dry environments during most months of the year. This condition is reflected in the vegetation cover of sparse shrubby caatinga. Despite the predominance of a rarefied vegetation cover, it is also possible to observe the presence of patches of arboreal trees, especially at the top of the plateaus, where the soil is more developed. Figure 11 shows photographs of the vegetation found in areas of rocky outcrops and sandy soils.

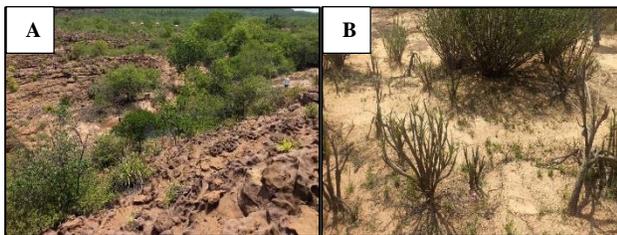


Figure 11 - Photos that highlight characteristics of vegetation in Cidade de Pedras. Source: Costa (Jan. 2020).

Thus, it was found that the biophysical aspects of the landscapes observed in the area of Cidade de Pedras, are in a state of instability, in relation to its morphodynamics, because it presents mostly shallow soils, with the presence of rocky outcrops and the relief presents strong dissection, a less dense vegetation cover. These characteristics are largely associated with the dry climate of the region and far from the humid valleys of the temporary rivers, constituting elements typical of the semi-arid environment of northeastern Brazil.

5. CONCLUSION

The field activity in Geography has a fundamental role in the construction of the researcher, because through direct observation of the geographical space it is possible to understand the concreteness of the theory about the composition and the relations that are established in the biophysical environment, discussed in class and in the geographic literature. Therefore, it is in practice that the landscape is seen in its real dimension, being able to identify aspects "hidden" in the scales of cartographic representation and to expand the discussions about the current dynamics in which the landscapes are found, including those of the semi-arid environment.

Thus, through the points of analysis it was possible to identify biophysical characteristics that present differences and also similarities, mainly with regard to the aspects of relief, soils and vegetation. It was found that the area of the city of Prata do Piauí has shallow soils and large areas of rocky outcrops, but greater availability of underground water that comes to the surface in "water eyes" that supply some local streams, although most have a temporary regime.

With regard to vegetation cover, it is inserted in a transition environment between the cerrado and caatinga biomes, translated by the alternation of patches of plant species in these two biomes, with stretches of tree cover, with strips of babaçu trees also standing out. The Cidade de Pedras region, on the other hand, has a greater expressiveness as to the characteristics of the northeastern semi-arid region, a greater intensity of aridity was observed in the field in relation to the absence of water, with a high frequency of litolic neossols and also of rocky outcrops, therefore, the two cities characterized as environments where morphogenesis has a greater prevalence in relation to pedogenesis.

The predominance of vegetation cover is rarefied, typical of the shrubby caatinga, differing from the natural conditions of Prata do Piauí, falling within the classification of semi-arid *strict sensu*.

Thus, the field activity proved to be a practical activity of great importance for the understanding of the semi-arid landscape, having as theoretical assumption an integrated analysis of the environment, and thus establishing a relationship between the theoretical aspects and comparative observations between the local landscapes, identifying differences and similarities observed *in loco* in the cities classified as belonging to the semi-arid environment of the State of Piauí.

6. REFERENCES

- AGUIAR, R. B.; GOMES, J. R. C. *Projeto cadastro de fontes de abastecimento por água subterrânea, estado do Piauí: diagnóstico do município de Prata do Piauí*. Fortaleza: CPRM - Serviço Geológico do Brasil, 2004.
- AZAMBUJA, L. D. Trabalho de campo e ensino de Geografia. *Geosul*, Florianópolis, v. 27, n. 54, p 181-195, jul./dez. 2012.
- BERTRAND, G. Paisagem e Geografia Física Global: esboço metodológico. *Caderno de Ciências da Terra*, n. 13, p. 141-152. 1972.
- BERTRAND, G.; TRICART, J. Paysage et géographie physique globale. Esquisse méthodologique. *Revue géographique des Pyrénées et du Sud-Ouest*, Toulouse, tome 39, fascicule 3, p. 249-272, 1968. Disponível em: https://www.persee.fr/doc/rgpso_0035-3221_1968_num_39_3_4553. Acesso em: 21 set. 2019.
- BRASIL. Ministério da Integração Nacional. *Nova delimitação do semiárido brasileiro*. Brasília: MIN/Secretaria de Políticas de Desenvolvimento Regional, 2005.
- BRASIL. *Lei nº 175, de 7 de janeiro de 1936*. Disponível em: http://www.planalto.gov.br/ccivil_03/leis/1930-1949/L175.htm. Acesso em: 10 maio 2020.
- BRASIL. *Decreto de Lei nº 9.857, de 13 de setembro de 1946*. Disponível em: http://www.planalto.gov.br/ccivil_03/Decreto-Lei/1937-1946/Del9857.htm. Acesso em: 10 maio 2020.
- CAMARGO, L. H. R. *A geografia da complexidade: o encontro transdisciplinar da relação sociedade e natureza*. Tese (Doutorado em Geografia) – Programa de Pós Graduação em Geografia. Universidade Federal do Rio de Janeiro, 2002.
- CARVALHO, M. S. B. S. *Redimensionamento do Semiárido Cearense: Uma reflexão*. Disponível em: https://www.cidades.ce.gov.br/wpcontent/uploads/sites/12/2017/06/funceme_margareth_29_reuniao_concidades.pdf. Acesso em: 18 de abr. 2020.
- CHRISTOFOLETTI, A. *Modelagem de sistemas ambientais*. São Paulo: Editora Edgard Blucher Ltda, 1999.
- CORRÊA, R. L. *Trabalho de campo e globalização*. In: Colóquio: O discurso geográfico na aurora do séc. XXI. 27-29. nov. UFSC, Florianópolis, 1996.
- CPRM. Companhia de Pesquisa de Recursos Minerais. Ministério d Minhas e Energias. *Mapa Geológico do Estado do Piauí*. 2º versão. Teresina, 2006.
- DELGADO, E. N.; COUTO, E. V.; PASSOS, M. M. A evolução da paisagem do município de Novo Itacolomi: uma abordagem ambiental. *Acta Scientiarum. Human and Social Sciences*, Maringá, v. 31, n. 2, p. 197-204, 2009.
- DOLFUSS, O. *Análise Geográfica*. São Paulo: Difusão Européia do Livro, 1973.
- EMPRESA BRASILEIRA DE PESQUISA AGROPECUÁRIA - EMBRAPA. (Brasil). *Solos do Nordeste*. Recife, 2014.
- GEORGE, P. *Dictionnaire de la géographie*. Paris: Presses Universitaires, 1970.
- IBGE. *Divisão do Brasil em Mesorregiões e Microrregiões Geográficas*. Vol I. Rio de Janeiro: Fundação do Instituto Brasileiro de Geografia e Estatística (IBGE). Diretoria de Geociências (DGC) e Departamento de Geografia (DEGEO). Rio de Janeiro. 1990.
- _____. Departamento de Recursos Naturais e Estudos Ambientais. *Manual Técnico da vegetação brasileira*. Rio de Janeiro: IBGE, 1992.
- _____. *Semiárido brasileiro*, 2014. Disponível em: <https://www.ibge.gov.br/geociencias/cartas-e-mapas/mapas-regionais/15974-semiarido-brasileiro.html?edicao=16195&t=sobre>. Acesso em: 18 de abr. 2020.
- LIMA, I. M. M. F. (coord.). *Mapa de delimitação do Brasil Semiárido (Estado do Piauí)*. Relatório Técnico. Convênio CNPq/SUDENE/UFPI, 1984. Disponível em: <http://iracildefelima.webnode.com>. Acesso em: 10 mar.2020.
- _____. Bacia hidrográfica do rio Poti: ambientes e paisagens de transição. In: LIMA, I. M. M. F.; ALBUQUERQUE, E. L. S. (Org.). *Rio Poti: caminhos de suas águas*. Teresina: EDUFPI, 2020.
- LIMA, I. M. M. F.; ABREU, I. G.; LIMA, M. G. *Definição atual do ambiente semiárido piauiense* (2000; 2004).
- _____. *Semiárido Piauiense: Delimitação e Regionalização. Carta CEPRO*, Teresina (PI), v. 18, p. 162-183, 2000.
- LIMA, I. M. M. F.; ABREU, I. G. *O Semiárido piauiense: vamos conhecê-lo? 2ª*. Tiragem. Teresina (Piauí): EDUFPI, 2007.
- OLIVEIRA, L. Estudo metodológico e cognitivo do mapa. In: ALMEIDA, R. D. (Org.) *Cartografia escolar*. 1 ed. Contexto, São Paulo, 2007.
- ORTIGOZA, S. A. G. *Paisagens do consumo: imagens e representações do mundo do consumo*. São Paulo, Lisboa, Dubai e Seul [online]. São Paulo: Editora UNESP, 2010.
- PASSOS, M. M. *Perspectiva da ecohistória aplicada ao estudo da paisagem*. Santa Rosa. La Pampa: Instituto de Biogeografia y Medio Ambiente, 2001.
- _____. *Biogeografia e paisagem*. 2. ed. Maringá: UEM, 2003.

-
- RADAMBRASIL. *Levantamento de recursos naturais*. Rio de Janeiro: Ministério das Minas e Energia/IBGE/Projeto RadamBrasil, 1973.
- RELFG (REDE DE ENSINO LUIZ FLÁVIO GOMES). *O que se entende por Polígono das Secas?* (2009?). Disponível em: <https://lfg.jusbrasil.com.br/noticias/1013964/o-que-se-entende-por-poligono-das-secas>. Acesso em: 20 mar.2020.
- RODRIGUEZ, J. M. M.; SILVA, E. V. A classificação das paisagens a partir de uma visão geossistêmica. *Mercator*, Fortaleza, ano. 1. n. 1. p. 95-112, 2002.
- SANTOS, M. *Por uma nova geografia*. São Paulo: Edusp, 2002.
- _____. *Pensando o espaço do homem*. São Paulo: Edusp, 2004. (Coleção Milton Santos).
- SILVA, J. F. A. Geodiversidade e patrimônio geológico / geomorfológico das “Cidades de Pedras”, Piauí: potencial turístico e didático. *Dissertação* (Mestrado em Geografia). Teresina: Universidade Federal do Piauí, UFPI, 2017.
- SOUZA, M. L. *Os conceitos fundamentais da pesquisa sócio-espacial*. 1. ed. Rio de Janeiro: Bertrand Brasil, 2013.
- SUERTEGARAY, D. M. A. Pesquisa de campo em Geografia. *Geographia* (UFF), v. 7, p. 92-99, 2002.
- SCHIER, R. A. *As concepções da paisagem no código florestal*. Dissertação (Mestrado) Programa de Pós Graduação em Geografia. Universidade Federal do Paraná, Curitiba, 2003.
- THOMAS, M. F. Landscape sensitivity in time and space: an introduction. *Catena*, v. 42, p. 83-98, 2001.
- VENTURI, L. A. B. (Org.). *Praticando geografia: técnicas de campo e laboratório e geografia*. Oficina de Textos, São Paulo, 2005.
- VIANA, A. I. G.; NUNES, H. K. de B.; SILVA, J. F. de A.; CABRAL, L. J. R. S.; AQUINO, C. M. S. Análise geoambiental em atividade de campo no Nordeste Setentrional brasileiro: estudo de caso nos estados do Piauí e Ceará. *Revista Brasileira de Geografia Física*, v.10, n. 2, p. 597-609, 2017.

Received in: 24/04/2020

Accepted for publication in: 19/07/2020