

HAZARD OF DESERTIFICATION AT IBITIPOCA REGION, SOUTHEAST OF MINAS GERAIS STATE, BRAZIL

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INTRODUCTION

The high risk of desertification in Brazil reaches 16% of its territory, including 1482 municipalities only at the semi arid environment (Ministry of Environment, 2005). In terms of human beings, it means almost 32 millions of people, that represents 18% of the Brazilian population. The areas already impacted sum 181000 km², and the economical impact reaches US\$800 million/year.

But it is not only at the Brazilian semi arid region, located at the northeast part of the country, that the risk of desertification exists.

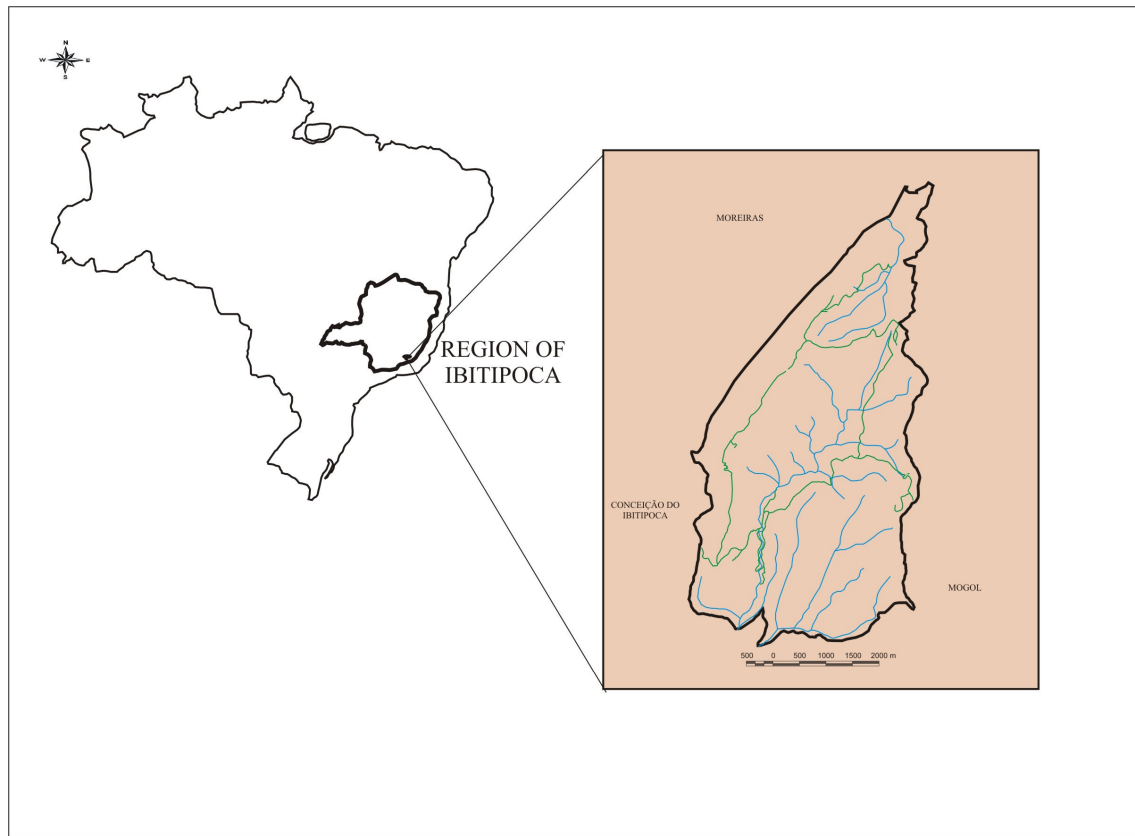
It is well known the desertification problem at the Rio Grande do Sul state, a region with temperate climate, notably in the municipality of Alegrete, in a place called Deserto de São João (BRASIL, 1994; SOUTO, 1984)

Several causes may be listed as responsible for the process, since the climatic pattern, passing by overgrazing and soil salinization, until the natural fragile characteristics and use of the physical substrate.

The Ibitipoca Region, located southeast of Minas Gerais state, in Brazil, is composed basically by thick grained, not cemented and faulted quartzite rocks (figure1). The weathering process has broken this geological material, predominantly composed of quartz, creating a coarse sandy sediment that forms several deposits in the region. The sparse vegetation and the inadequate use of the land has created several hot spots of desertification in the region. Once removed the vegetation, the erosion takes place and magnifies the affected area, menacing the surroundings.

The objective of this work is to show the geographical distribution of the areas already impacted by desertification, and to alert about the risks of expansion of the process to the surroundings locations, furnishing digital environmental data to subsidize actions and politics of sustainable development to the region.

Figure 1. Location of the studied area



MATERIALS AND METHODS

The research group on Environmental Zoning and Risk (CNPq/UFJF) of the University of Juiz de Fora, has worked at the Ibitipoca region since 1996. The research involves mapping of environmental factors, with works at the field and insertion of data in a System of Geographical Information (SAGA/UFRJ). Between the several planes of environmental information, it was made the Map of Vegetation and Soil Use. To do this, it was used and interpreted aerial photographs at scale 1:30000 (CEMIG, 1986) of the region, with delimitation of limits of the area, as well as preliminary interpretation of the vegetative distribution pattern. As a support tool it was used a Landsat 7 satellite image, with composition R5G4B3 of august of 2000.

The field work made possible the definition of the mapping units of vegetation and land use. These units were plotted on a cartographic basis represented by the Bias Fortes IBGE topographic card, using UTM coordinates. The vegetal species collected were dried and identified at the herbarium of the Juiz de Fora university. For this work it was given special attention to the mapping unit called *areais* (sandy ground), that represents the desertification

spots of the area. The natural tendency is the expansion of these spots, and having this hypothesis in mind, it were traced, using GIS, buffers of 50, 100 and 250 meters around the spots. Those proximity perimeters indicate areas of risk of expansion of desertification in the area, demanding immediate actions of contention.

RESULTS AND DISCUSSION

Figure 2 shows the Vegetation and Land Use Map of the Ibitipoca region. It can be seen, for the surroundings of the Ibitipoca Park, the dominance of pastures, resulted from the deforestation and early use of the land for coffee plantations. Otherwise, there still are good remainings of the Atlantic Forest at the east and south-east limits of the park, as well as at the its north-west part. The forestation of the south and south-west outside limits of the park, with the formation of a ecological corridor, would be a good sustainable idea. It is interesting to note that the map also shows, at its north-west part, the beginnings of the savanna (cerrado) vegetation, a vegetative environment that will continue in direction to the central part of Minas Gerais state. That is, the map shows the transition area between Atlantic Forest and Savanna vegetation, and represents an important tool to other researches on this topic, and also acts as an alert to the necessity of preservation of this site.

If we look at the east side of the map, it is possible to see at the north-east, and also at the south parts, several zones mapped as areas (sandy grounds), in a total of 24 spots. They are areas without vegetation, occupied by sandy soils, with incoherent quartz grains, and impacted by several levels of linear erosion. Approximately half of those areas are located at the rural space, as it can be see at north-east, and the other half part is occupied by the community of Mogol, at the south-east. Both areas have the same physical fragility, but at north the cattle overpasture and the deforestation were important causes for the desertification, while in the south, the occupation by the community was probably the main cause.

The figure 3 illustrates the Risk Map of Desertification Proximity traced. In this map the referential areas are the perimeter of the park, and the communities of Moreiras, at north; Conceição do Ibitipoca, at west; and Mogol, at south-east. The possible evolutions of the desertification can bee seen in different buffer evaluations adopted, where it is possible to occur even the coalition of the sandy areas, meaning the most dangerous event.

Figure 2. Vegetation and Land Use Map of Ibitipoca Region

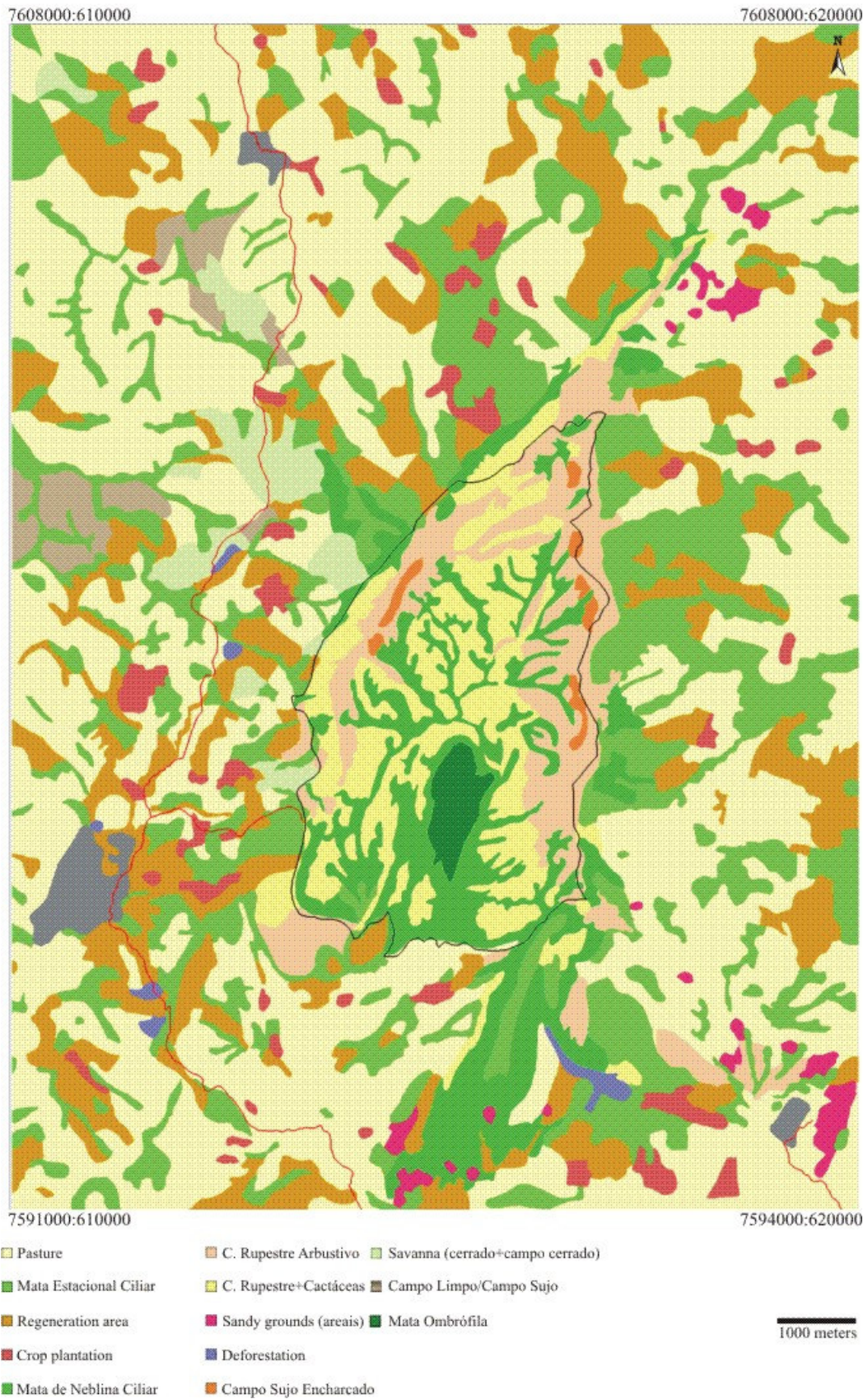
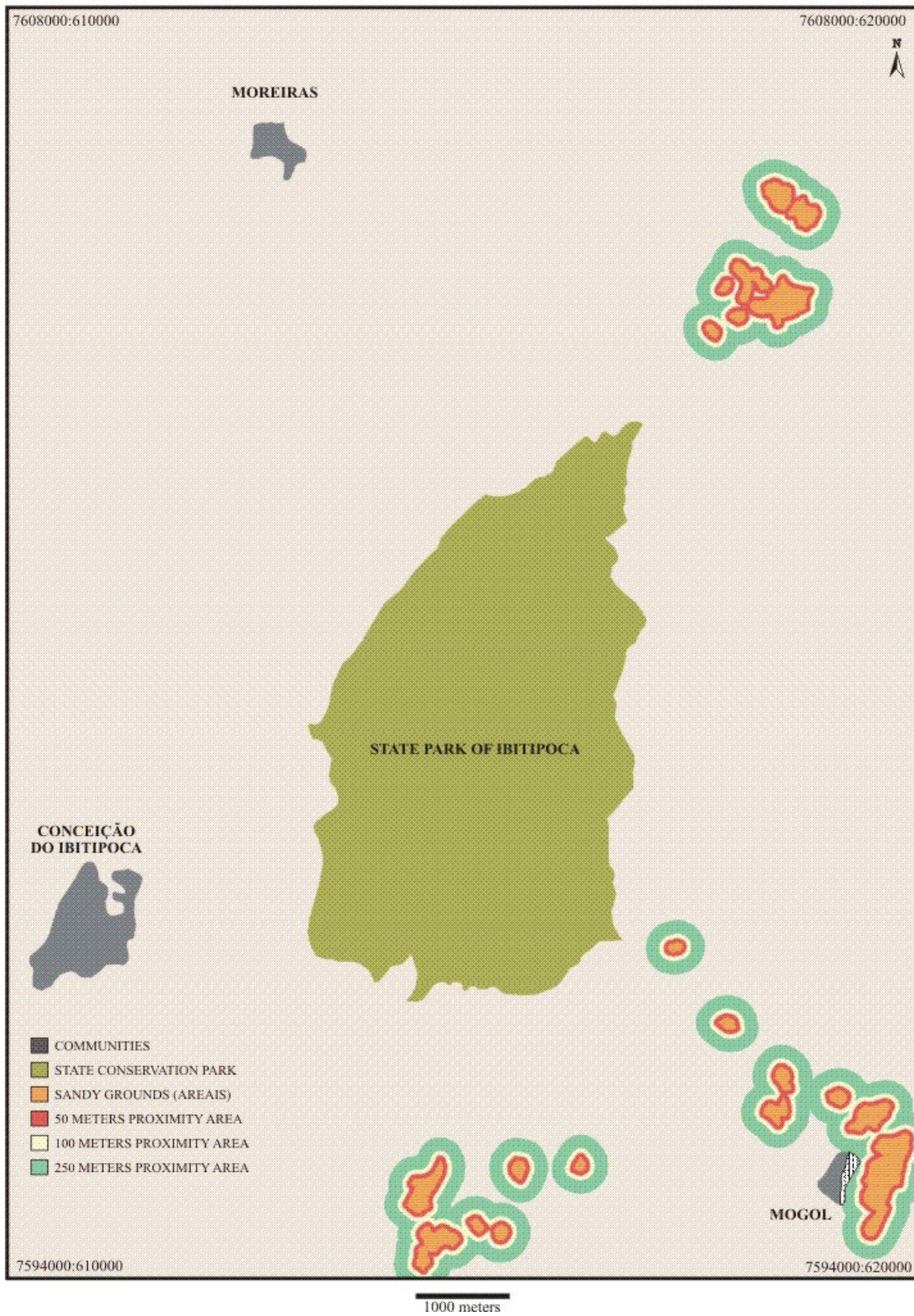


Figure 3. Risk Map of Desertification Proximity



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