



EROSIVE POTENTIAL OF RAINS IN THE CLIMATE CHANGE SCENARIOS IN THE UPPER TAQUARI RIVER BASIN, MS, BRAZIL

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INTRODUCTION

Brazilian Centre-Western Region has become a great producer of grain crops and meat along the last forty years. The typical climatic conditions of Cerrado Bioma are responsible for the dry winter and wet summer with convective rains which precipitates as storms with high kinetic energy drops ($\text{MJ ha}^{-1}\text{mm}^{-1}$). The vegetation is formed by "Cerrado" composed by bushes and grasses and "Cerradão", which has higher density of tree species. Soil studies in the region have pointed predominantly nutrient poor soils, iron- and aluminum-rich, good physical properties. Around 90% of the area of UTB is in the north region of Mato Grosso do Sul state, and the erosion effects are reflected downstream in the river, that is connected to the Pantanal Basin. These conditions, added to the management system used without conservationist practices and not obeying the environmental laws brought drastic consequences to the region such as the water erosion process (Figure 1), especially severe in the Upper Taquari Basin -UTB (Martorano et al,2002; Abdon, 2004; Lisboa, 2008).

MATERIAL AND METHODS

Monitoring erosion processes and data normal weather (Figure 1) were spatialized in Arcgis 9.3 and exported to the TerraView 3.2 (Figure 2), to create integration of variables in TerraME and to generate topo-climate maps.

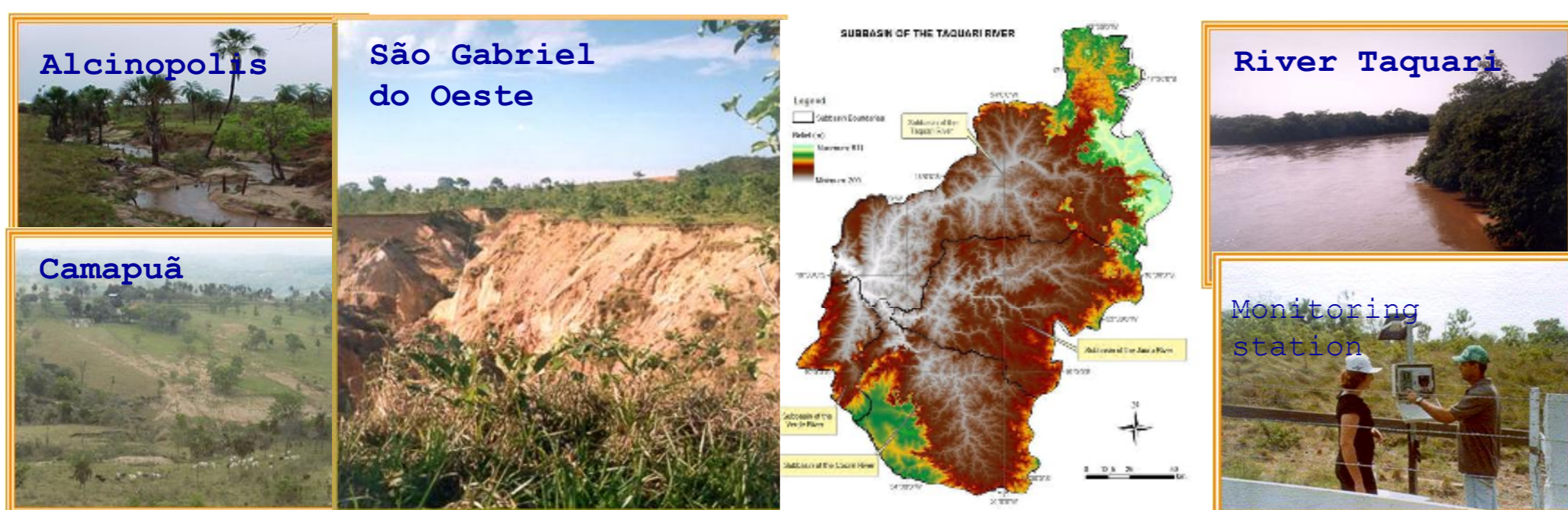


Figure 1. Monitoring erosion processes in the UTB

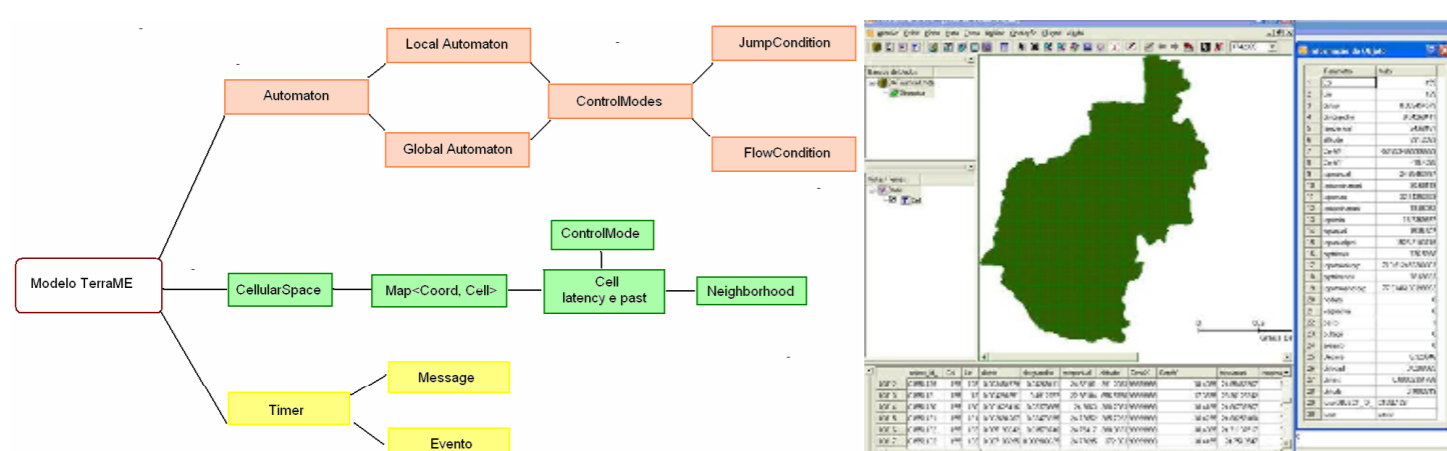


Figure 2. Dynamic Modelling using TerraME (Lisboa, 2008)

RESULTS AND DISCUSSION

Prevalent mean temperatures currently vary from 22.1 to 25.8°C and annual precipitation vary from 1433.8 to 1631.8 mm (Figure 3). In the wettest trimester, from December to February, it is verified that the highest values place next 782,0 mm and the lowest was 621,0 mm. In the less rainy trimester (June to August) the highest totals do not exceed 115,0 mm and the lowest reached only 53,0 mm.

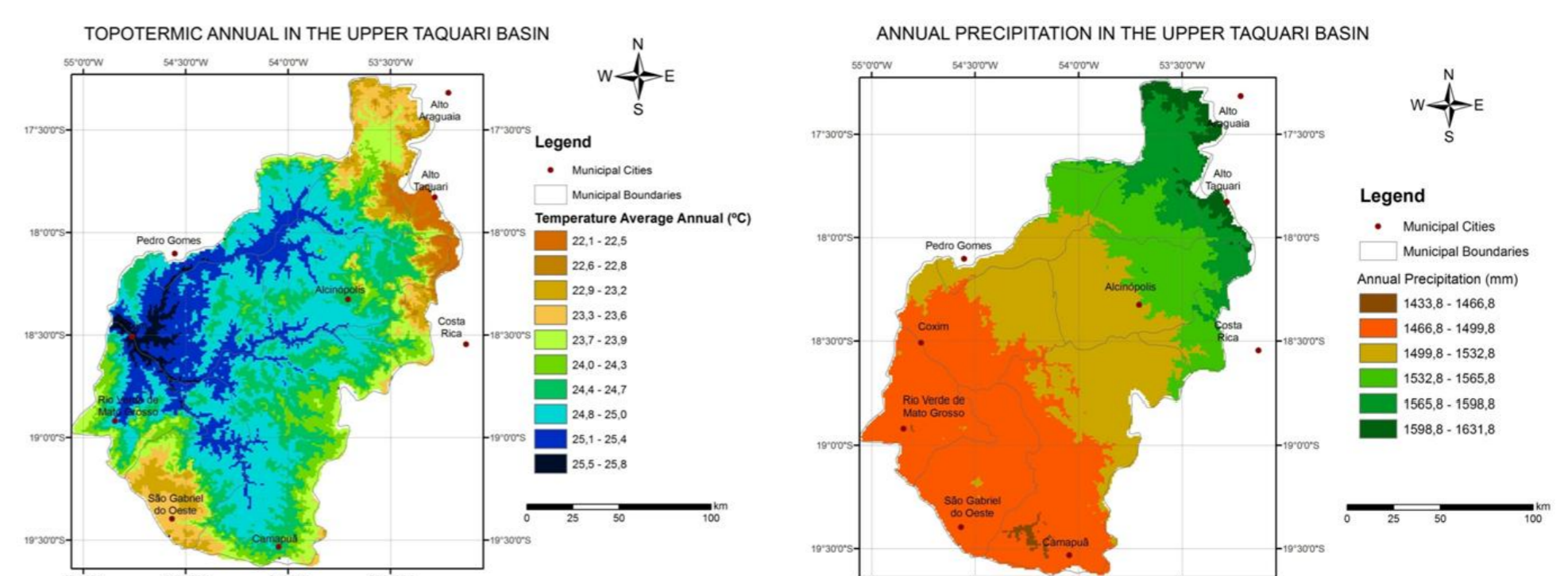


Figure 3. Annual topotermic and pluviometric precipitation conditions in the Upper Taquari Basin

Estimated rain erosivity in the UTB varies between 6.993,0 and 8.355,9 $\text{MJ mm.ha}^{-1} \text{h}^{-1} \text{year}^{-1}$, and the highest values are in the north region of UTB, in the areas of the municipalities Alto Taquari and Alcinópolis and partially, the areas of Alto Araguaia and Costa Rica. In the municipalities Rio Verde de Mato Grosso, Camapuã and Sao Gabriel do Oeste, the erosivity is lower than 7.254,9 $\text{MJ mm.ha}^{-1} \text{h}^{-1} \text{year}^{-1}$. These results agreed with those from Galdino et al.(2003), who observed that the average annual precipitation erosivity in the UTB was 7.914,3 $\text{MJ mm ha}^{-1} \text{year}^{-1}$.

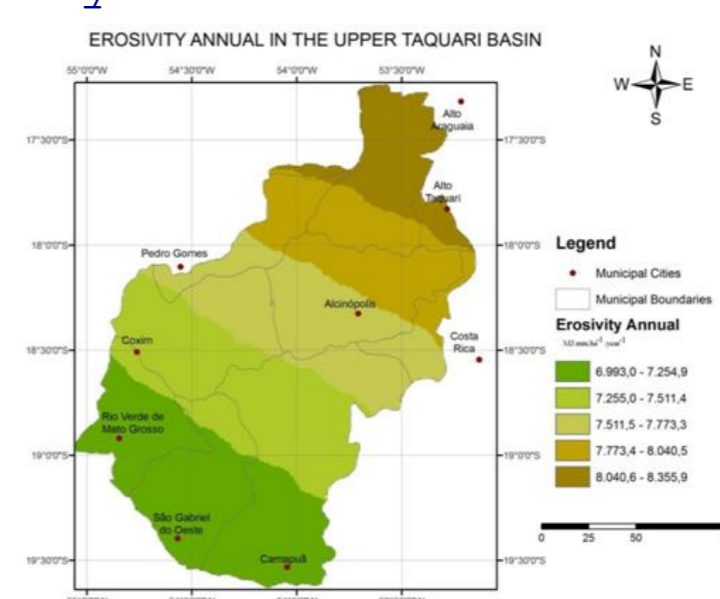


Figure 4. Erosivity annual conditions in the Upper Taquari Basin, MS, Brazil.

CONCLUSION AND OUTLOOK

These values increase severely in incremental annual pluviometric precipitation scenarios, showing that North of UTB the process will be worst in 2100 if conservationist management systems is not adopted, such as No-tillage cropping associated to the environmental laws application, such as the maintenance of vegetation in the riparian zone and in the areas with slopes higher than 45 degrees, considered by law as Permanent Preservation Areas.

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Key words: Cerrado Bioma, topopluvial scenario; TerraME; Permanent Preservation Areas.

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