

Estimates of soil losses in watershed under tropical of altitude climate in Brazil

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INTRODUCTION

Water erosion is one of the main degradation processes of tropical soils. In steepest areas with coffee cultivation, the erosion rates are intensified and could reach levels above the Soil Loss Tolerance Limits (T). Thus, the objective of this work was to evaluate the susceptibility to water erosion in steepest areas under predominant coffee cultivation using the Revised Universal Soil Loss Equation (RUSLE) and compare the results to T limit.

MATERIAL AND METHODS

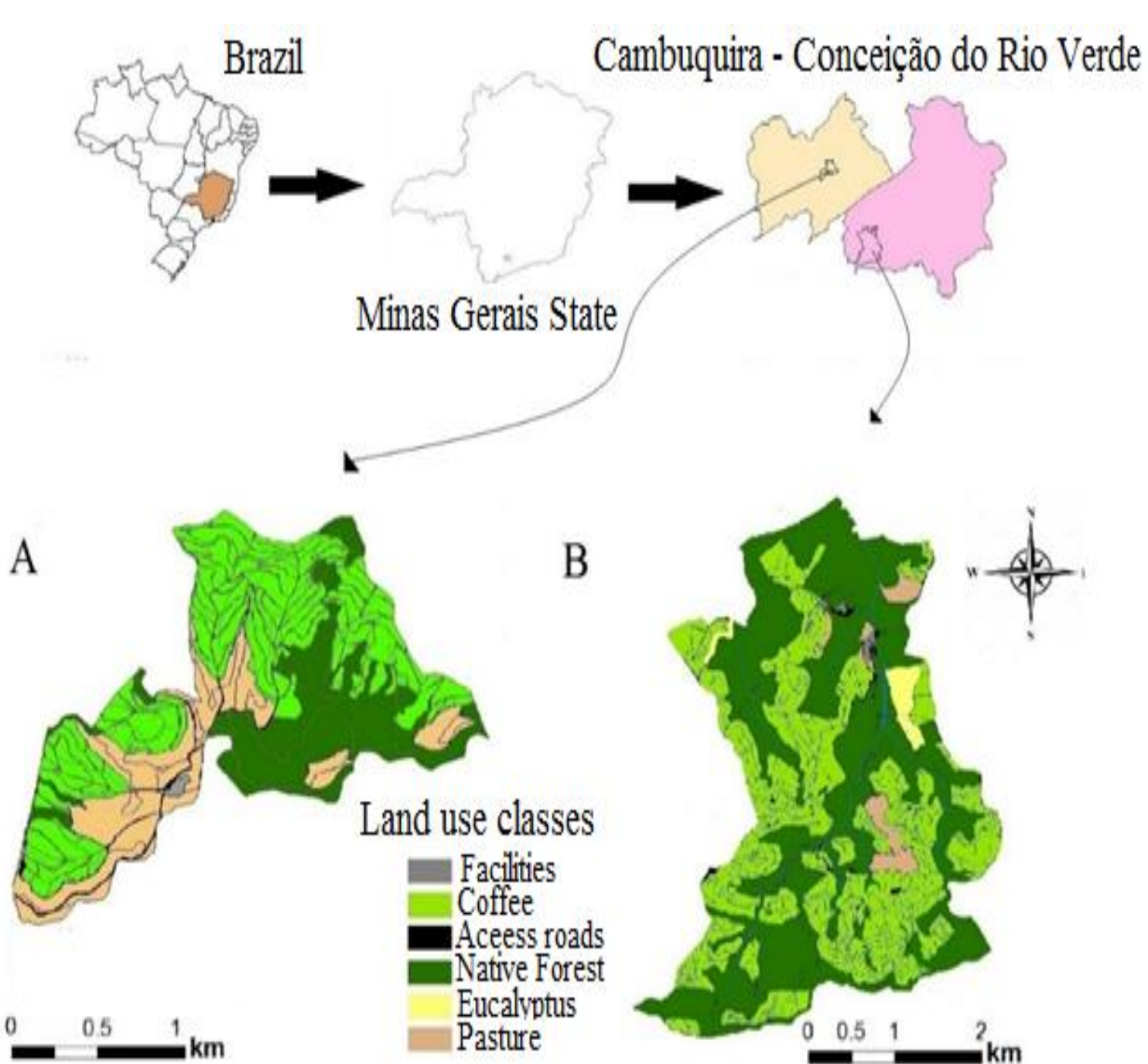


Figure 1. Location of Ribeirão José Lúcio subbasin, Conceição do Rio Verde Municipality and the Ribeirão São Bento subbasin Cambuquira Municipality, Minas Gerais, Brazil.

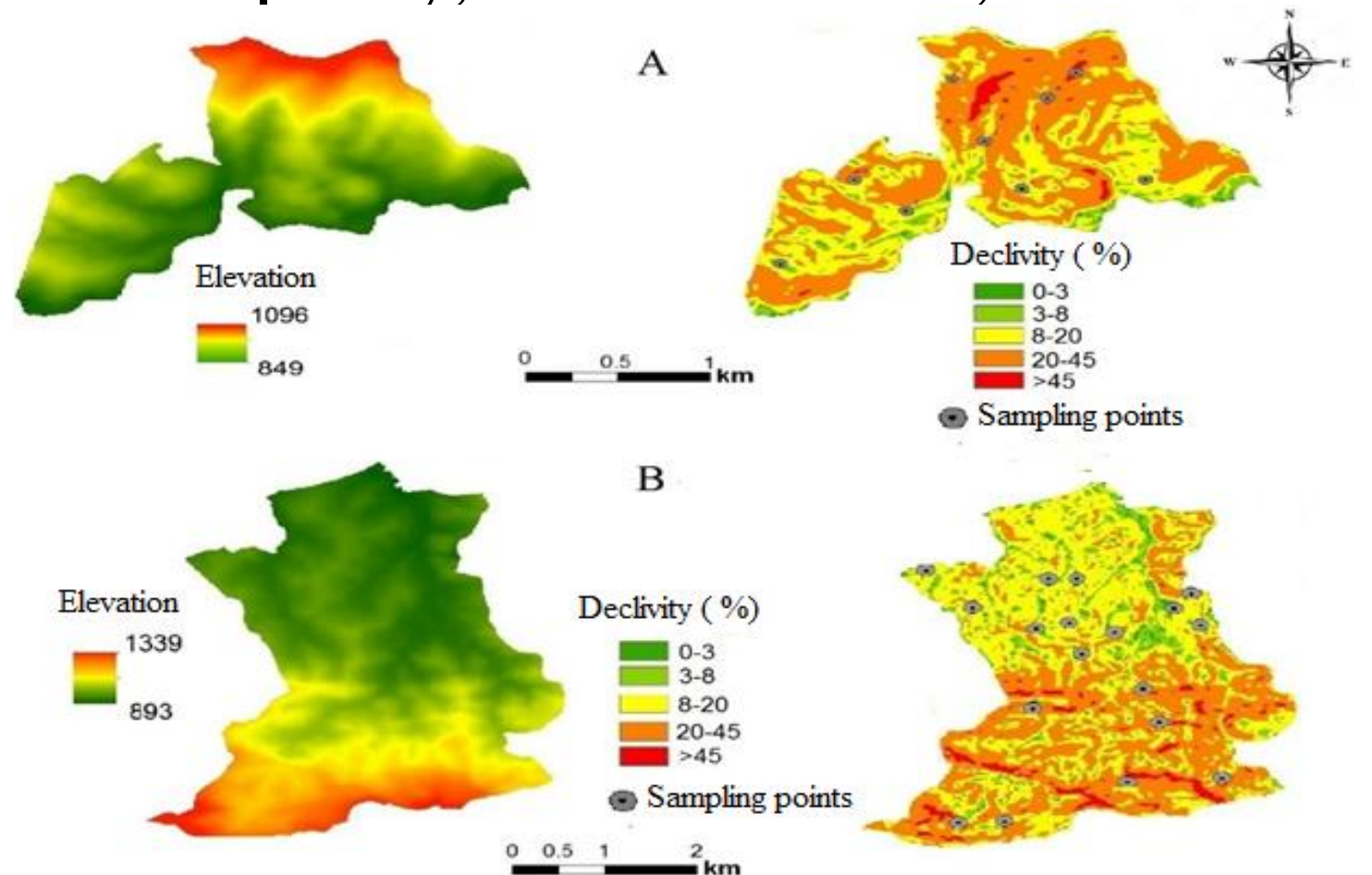


Figure 2. Digital Elevation Model (DEM) and Declivity maps in the Ribeirão São Bento (A) and Ribeirão José Lúcio (B) subbasins in the Cambuquira and Conceição do Rio Verde municipalities, respectively, Minas Gerais state, Brazil.

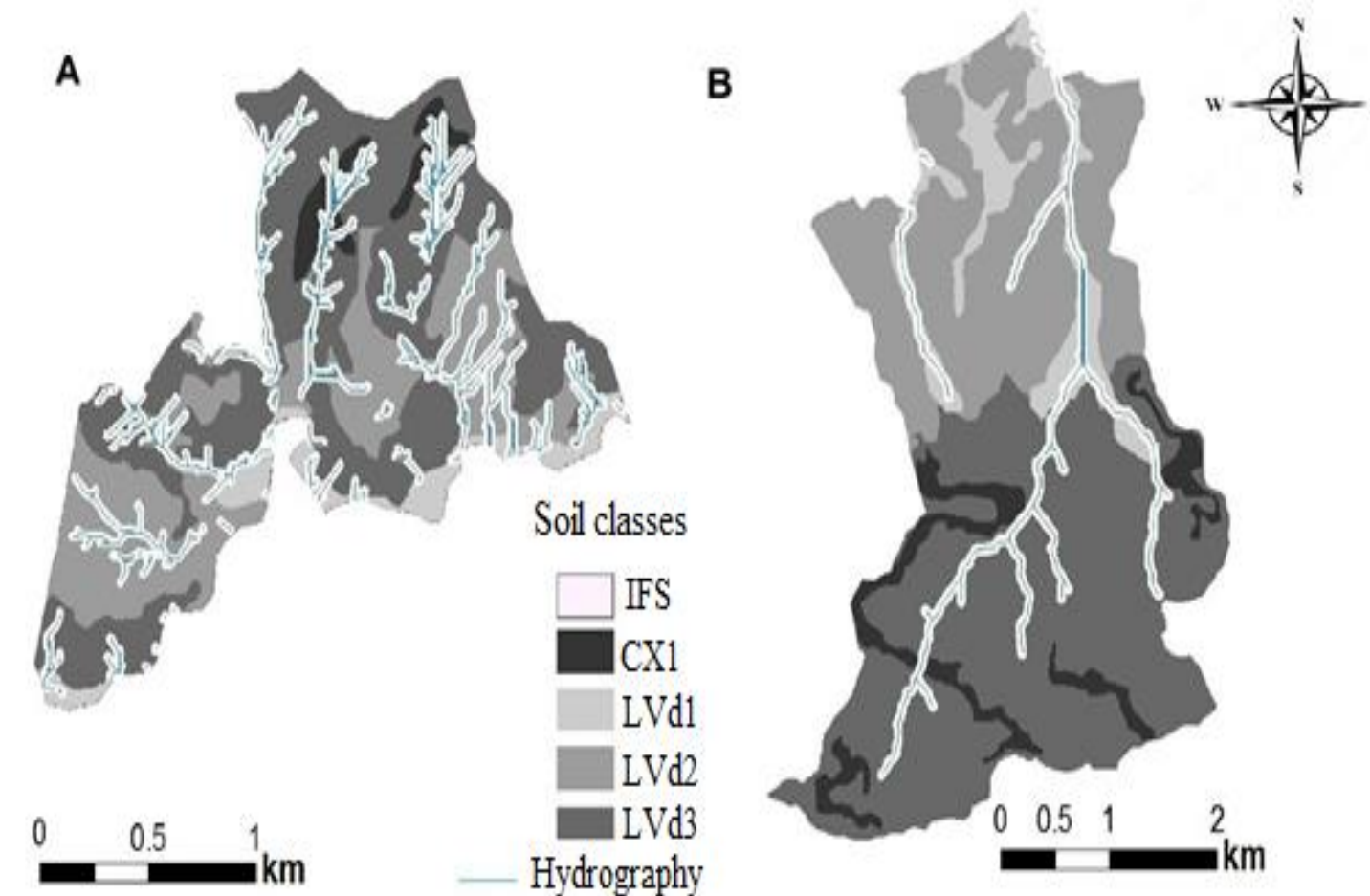


Figure 3. Digital soil maps: dystrophic red Latosol in a flat to slightly rolling relief (LVd1), dystrophic red Latosol in a rolling relief (LVd2), dystrophic red Latosol in a strongly rolling relief (LVd3), *indiscriminate floodplain soils* (IFS) and Haplic Cambisol (CX1) in the Ribeirão São Bento (A) and Ribeirão José Lúcio (B) subbasins in Cambuquira and Conceição do Rio Verde municipalities, respectively, Minas Gerais, Brazil.

RESULTS AND DISCUSSION

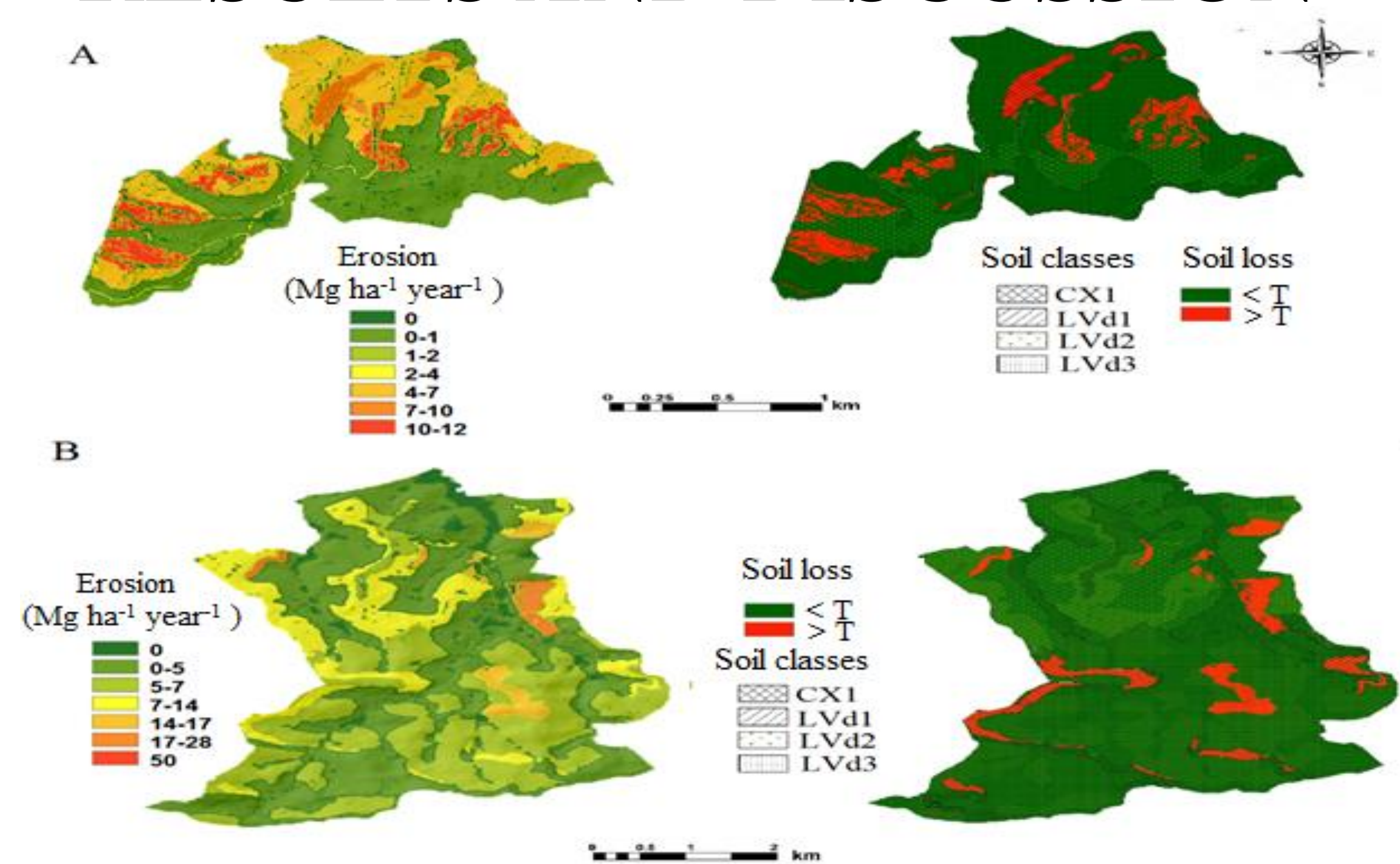


Figure 4. Soil loss rates and Soil loss Tolerance (T) in the Ribeirão São Bento (A) and Ribeirão José Lúcio (B) subbasins in Cambuquira and Conceição do Rio Verde municipalities, respectively, Minas Gerais, Brazil. Notes = dystrophic red Latosol in a flat to slightly rolling relief (LVd1), dystrophic red Latosol in a rolling relief (LVd2), dystrophic red Latosol in a strongly rolling relief (LVd3) and Haplic Cambisol (CX1)

CONCLUSIONS

The average soil loss was 3.7 Mg ha⁻¹ year⁻¹ and 3.1 Mg ha⁻¹ year⁻¹ in the Ribeirão José Lúcio and Ribeirão São Bento subbasins. With 13.16% and 7.90% of the areas above the limits of T, ranging from 6.5 Mg ha⁻¹ year⁻¹ to 8.5 Mg ha⁻¹ year⁻¹ for Oxisols and 5.5 Mg ha⁻¹ year⁻¹ for Haplic Cambisol. The RUSLE model is a quick, simple and inexpensive tool that helps to assess soil conservation in sub-basins.

The RUSLE model is a fast, simple, and inexpensive tool that contributes to the assessment of soil conservation in hydrographic subbasins.

ACKNOWLEDGEMENTS

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Soil losses were estimated using the Revised Universal Soil Loss Equation. (RUSLE)