

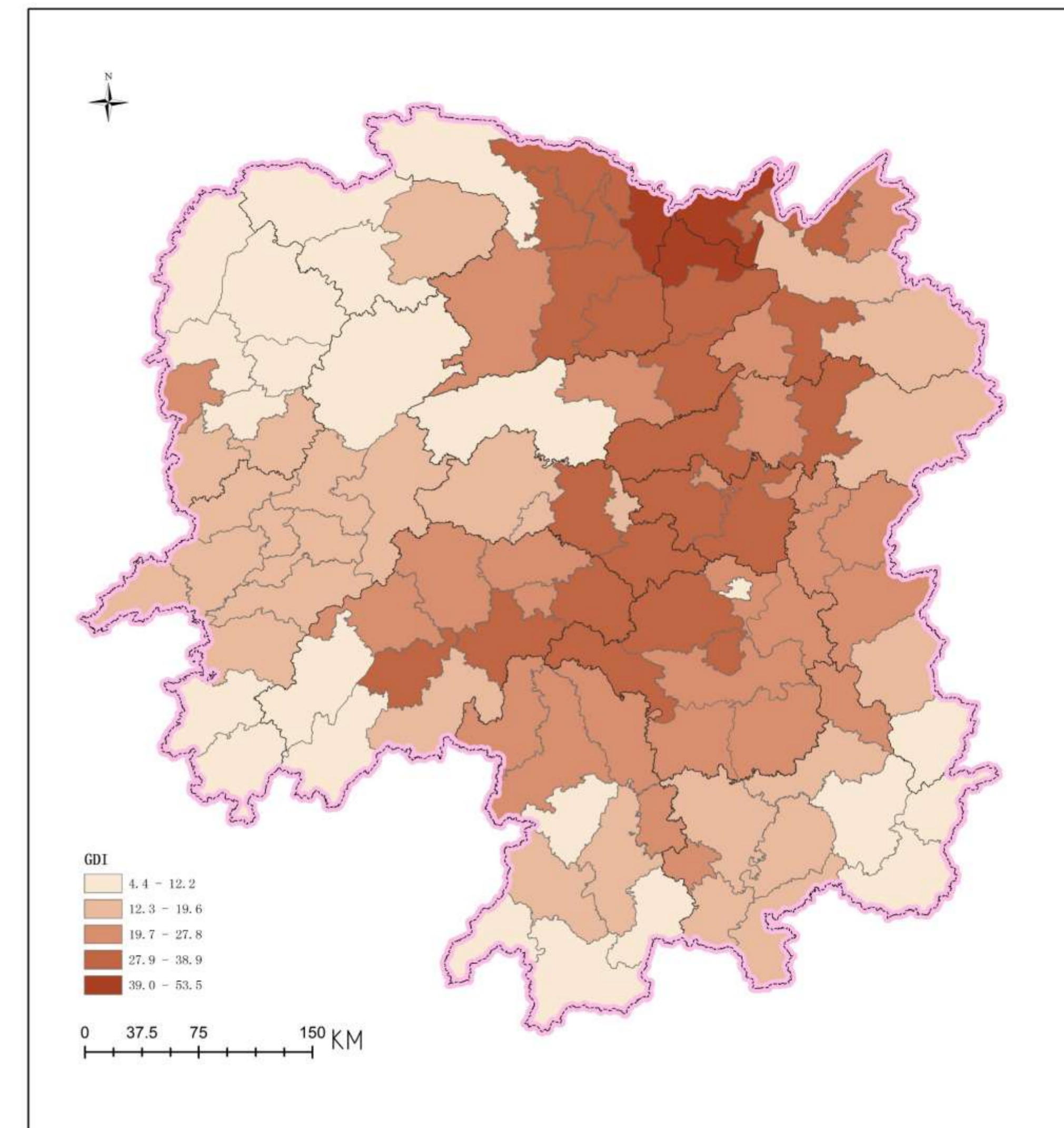
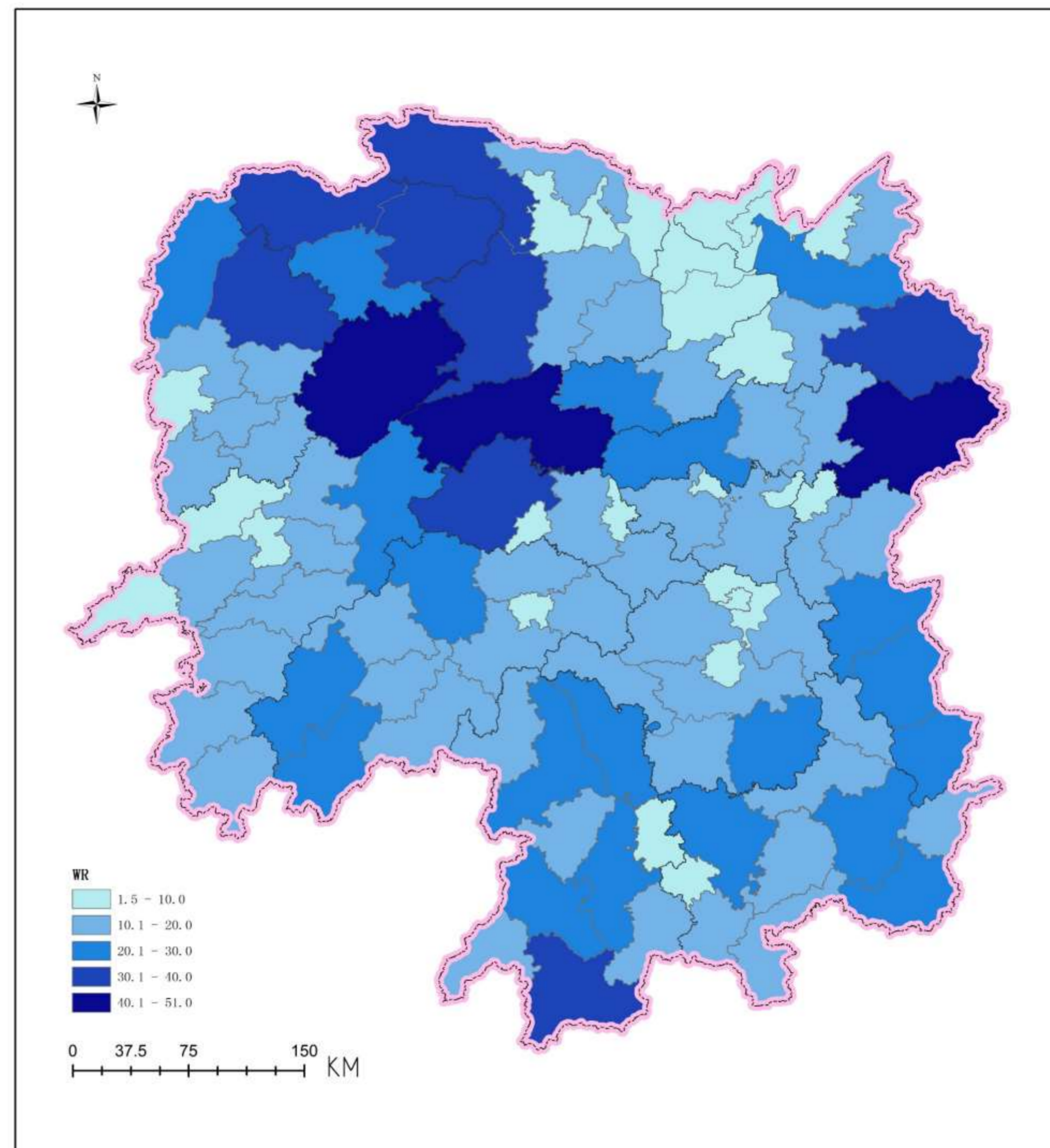
Spatial Matching Pattern and Difference Analysis of Water and Soil Resources in Hunan Province

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Objectives

The matching coefficient of water and soil resources is a quantitative relation index that reflects spatial-temporal matching degree of regional cultivated land resource and agriculture water resources quantity, and can analysis the spatial differences between different units in both horizontal and vertical dimensions. Gini coefficient can comprehensively reflects the balance degree of water and soil resources among each unit and reflect the disparity between the units. The combined utilization of water and soil matching coefficient and Gini coefficient for the study can be regarded as a data mining method for equilibrium analysis and resource matching degree, which can be applied to the matching status and balance pattern of water and soil resources in the study area.



Methods

This paper takes prefectural cities (states) and county-level administrative districts of Hunan Province as the research object, analyze and calculate the matching coefficient of water and soil resources in administrative units at all levels based on the data of land use, water resources and demographics in Hunan Province from 1980 to 2020; draws Lorenz curve, calculates Gini coefficient, and study the matching status and unbalance degree of regional water and soil resources; analyzes the spatial-temporal variation of water and soil resources and their matching status in Hunan Province by using the proportion of agricultural water use, soil and water matching coefficient and Gini coefficient.

Results

The results show that the current matching coefficient of soil and water resources in Hunan Province is 0.21, and the water and soil resources matching coefficients of five cities, including Hengyang, Shaoyang, Yueyang, Yiyang and Changde, are lower than the average level of the whole province. Regional matching difference is obvious, which shows a pattern of high matching in the east, south and west mountains, and low matching in the middle and north belly areas. Matching degree of soil and water resources in the Hengshaolou arid corridor and the northern Dongting Lake is comparatively poor.

Discussions

Topographic constraints and influence of the Three Gorges Project are the main reasons which cause the matching difference of water and soil resources. This paper puts forward policy guidance and suggestions for optimizing the matching pattern of water and soil resources in Hunan Province. And the research on spatial-temporal matching characteristics and differences between water & soil resources and social economic development factors has important practical significance to guide rational development and utilization of water resources in Hunan Province.

