



## **Evaluation of Potential Hydrological Connectivity Based on Improved IC Model——a case study of a Forest Area in Hani Rice Terraces, China**

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Hydrological Connectivity in landscape is a critical landscape indicator that depicts the relationship between landscape structure and hydrological function, and of great reference value in planning and protection of landscape. Water resource is the key element to the stability of the Cultural Landscape of Hani Rice Terraces, in which the forest area works as the water supply and safeguard for the rice terraces. The use of hydrological connectivity to evaluate the water source region of Hani terraced landscape and identify key areas can provide important reference to the protection of water sources in Hani rice terraces.

The development of Remote sensing, Geographical Information System and Global Position System technology provides the foundation for building a hydrological connectivity evaluation model based on geographical spatial data. As hydrological connectivity is not only controlled by factors of surface heterogeneity, such as slope and land use, but also affected by soil texture and soil moisture. This paper takes the forest area of Hani rice terraces as a case to evaluate its hydrological connectivity, through an improved Index of Connectivity(IC) model by adding factors of soil texture and soil moisture beside the two original factors of slope and land cover.

The results show that the improved model can elaborate the hydrological connectivity in the study area more precisely and increase the accuracy of potential hydrological connectivity value from the range of  $-5.27\sim 13.76$  to  $-3.48\sim 25.67$ . And the results of hot spot zones analysis are also more concentrated. The four areas ratio of extremely cold zone, less important zone, hot zone and transitional zone changed from 20.94%, 39.59%, 21.33% and 18.14% to 27.54%, 31.60%, 25.38% and 14.71%, which indicates that the improved IC model can be used to better describe the hydrological connectivity in study area. And through it we can identify key hydrological functional areas more appropriately and provide reference for landscape protection.

**Key words:** Hydrological Connectivity of Landscape; Forest Area of Hani Rice Terraces; IC Model; Soil Texture; Soil Moisture