

Research on Territorial Ecological Restoration in Mianzhu City, Sichuan, under the Dual Evaluation Framework

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Abstract : Background: In response to the post-pandemic directives of Xi Jinping concerning the new era of ecological civilization, China has embarked on ecological restoration projects across its territorial spaces. This initiative faces challenges such as complex evaluation metrics and subpar informatization standards. Methodology: This research focuses on Mianzhu City, Sichuan Province, to assess its resource and environmental carrying capacities and the appropriateness of land use for development from ecological, agricultural, and urban perspectives. The study incorporates a range of spatial data to evaluate factors like ecosystem services (including water conservation, soil retention, and biodiversity), ecological vulnerability (addressing issues like soil erosion and desertification), and resilience. Utilizing the Minimum Cumulative Resistance model along with the 'Three Zones and Three Lines' strategy, the research maps out ecological corridors and significant ecological networks. These frameworks support the ecological restoration and environmental enhancement of the area. Results: The study identifies critical ecological zones in Mianzhu City's northwestern region, highlighting areas essential for protection and particularly crucial for water conservation. The southeastern region is categorized as a generally protected ecological zone with respective ratings for water conservation functionality and ecosystem resilience. The research also explores the spatial challenges of three ecological functions and underscores the substantial impact of human activities, such as mining and agricultural expansion, on the ecological baseline. The proposed spatial arrangement for ecological restoration, termed 'One Mountain, One Belt, Four Rivers, Five Zones, and Multiple Corridors', strategically divides the city into eight major restoration zones, each with specific tasks and projects. Conclusion: With its significant 'mountain-plain' geography, Mianzhu City acts as a crucial ecological buffer for the Yangtze River's upper reaches. Future development should focus on enhancing ecological corridors in agriculture and urban areas, controlling soil erosion, and converting farmlands back to forests and grasslands to foster ecosystem rehabilitation.

Keywords : ecological restoration, resource and environmental carrying capacity, land development suitability, ecosystem services, ecological vulnerability, ecological networks

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