

Study on the Spatiotemporal Changes and Driving Factors of Habitat Quality in the Yarlung Zangbo River from 2000 to 2020

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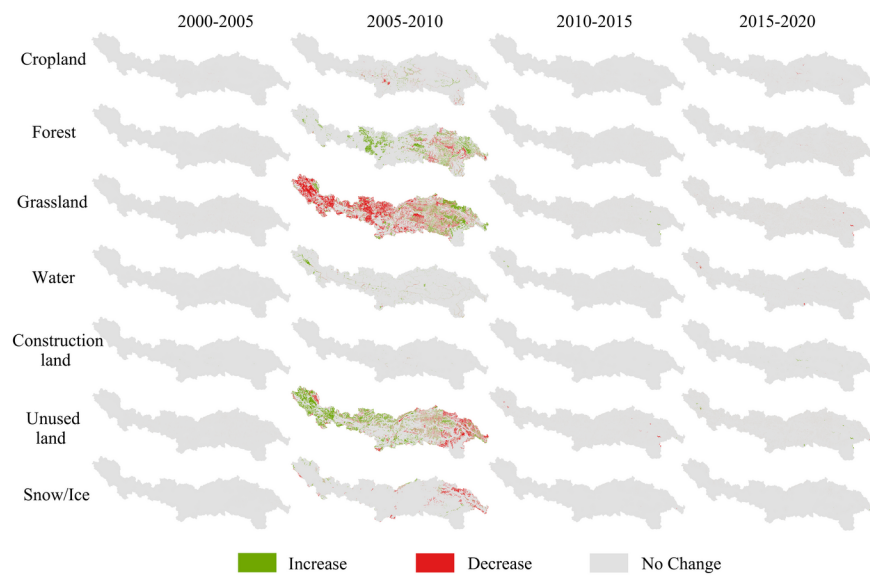
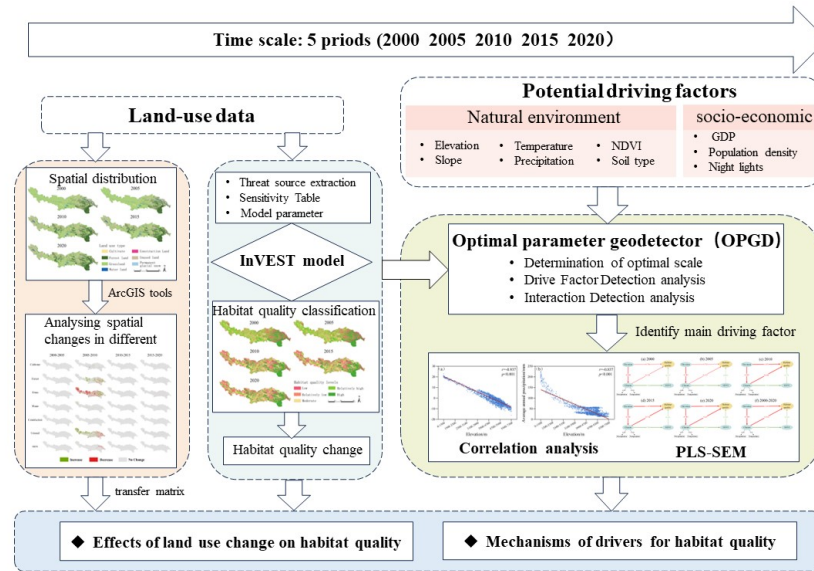
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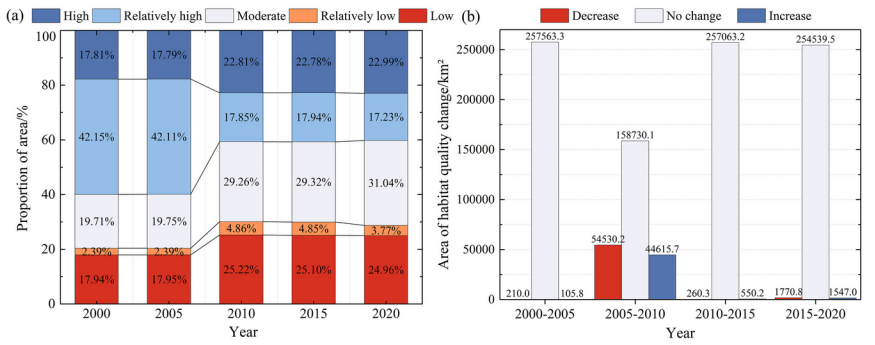
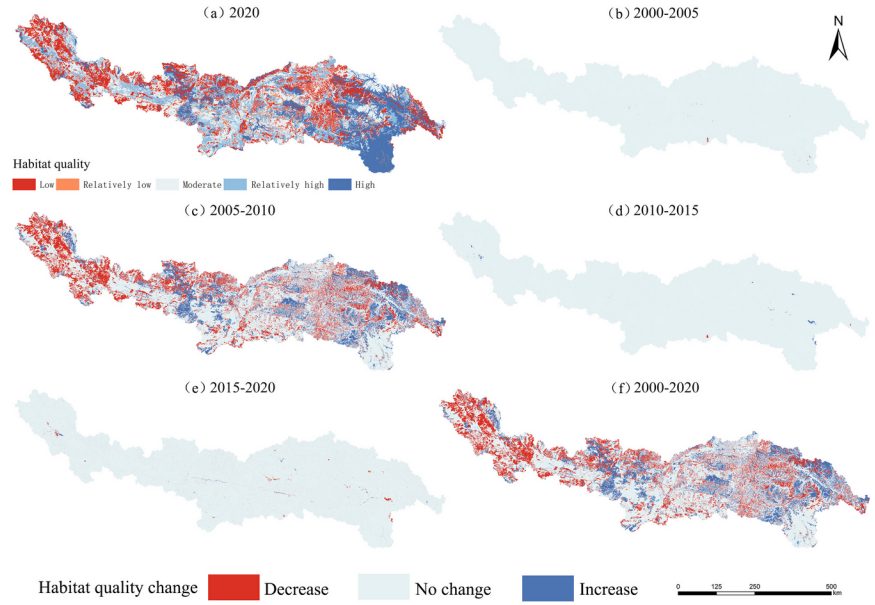
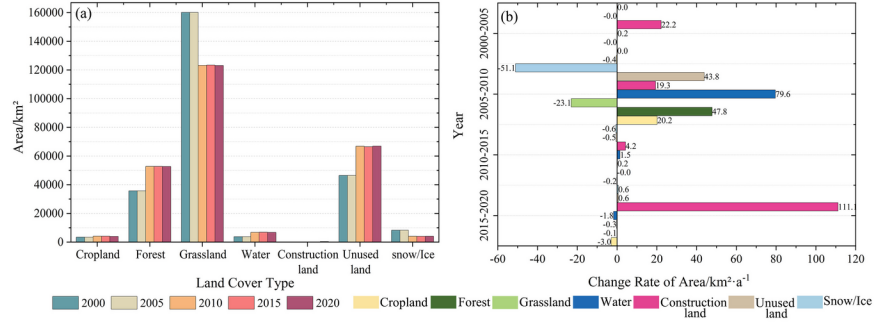
Abstract

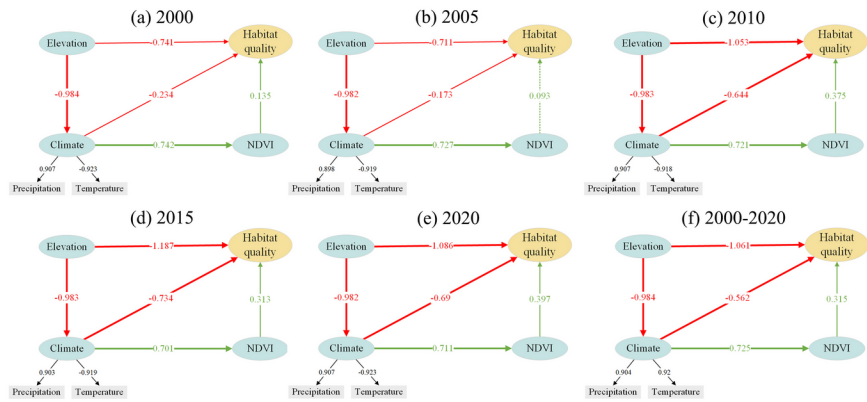
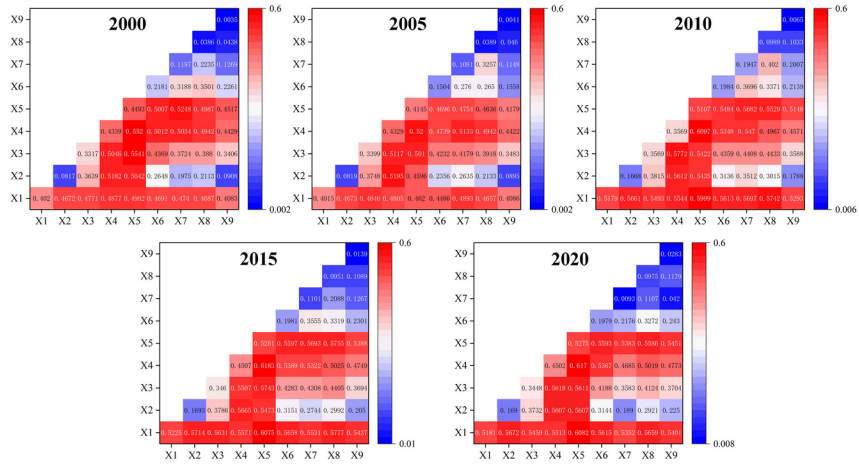
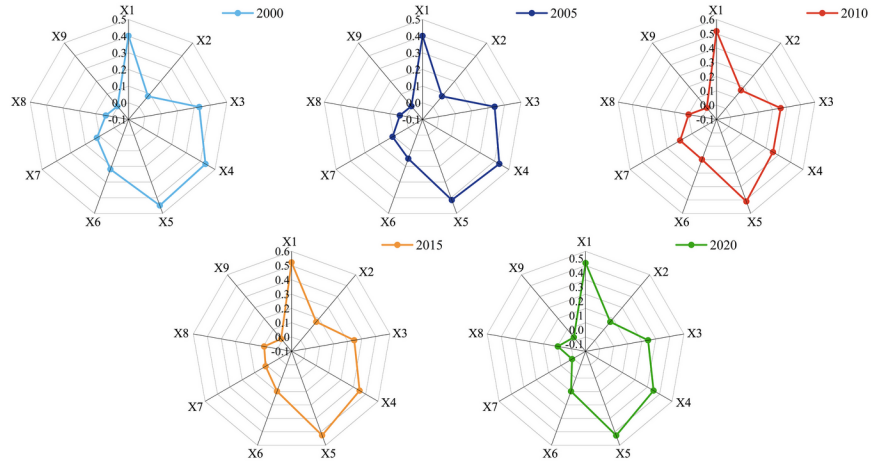
The Yarlung Zangbo River (YLZB), as the highest plateau river in the world, has a particularly fragile ecological environment and is easily impacted by global climate change. Studying the changes in its habitat quality and the driving mechanisms behind them is crucial for the ecological protection and sustainable development of the YLZB. Based on land use data from 2000 to 2020, using a habitat quality model, optimal parameter geographical detector, and partial least squares structural equation model (PLS-SEM), we conducted a quantitative study on the spatiotemporal changes and driving mechanisms of habitat quality in the YLZB from 2000 to 2020. The results show that: (1) Forests, grasslands, and unused land account for 94.14% of the basin area. The areas of unused land, forest land, and water bodies have continuously increased, while the areas of grasslands, permanent glaciers, and snowfields have continuously decreased. The decline was most pronounced from 2005 to 2010. The habitat quality in the study area is higher in the southeast and lower in the west. The area of degraded habitats is significantly larger than that of improved habitats. (3) NDVI, elevation, and annual average temperature are key factors affecting changes in habitat quality. Elevation indirectly affects NDVI by influencing climate conditions, leading to a decline in habitat quality. Our research findings help to better understand the ecological dynamics within the basin and provide scientific insights for sustainable management and conservation efforts.

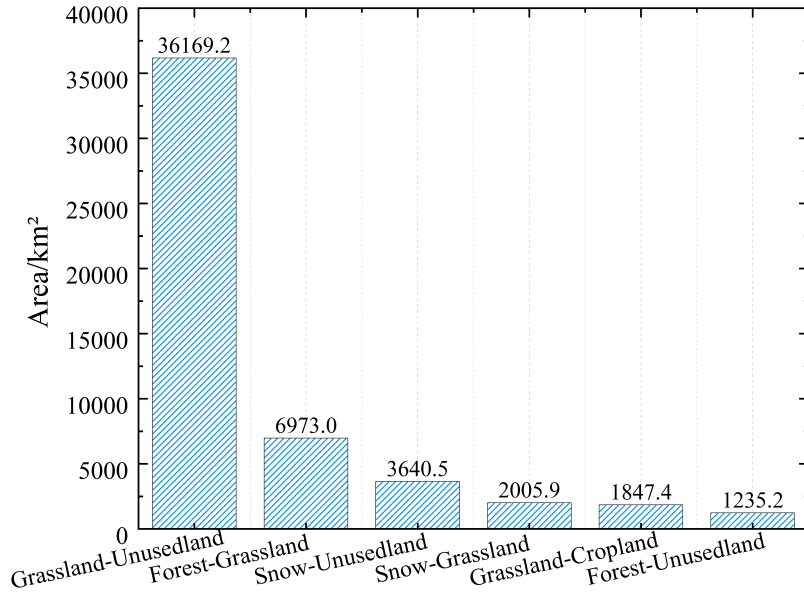
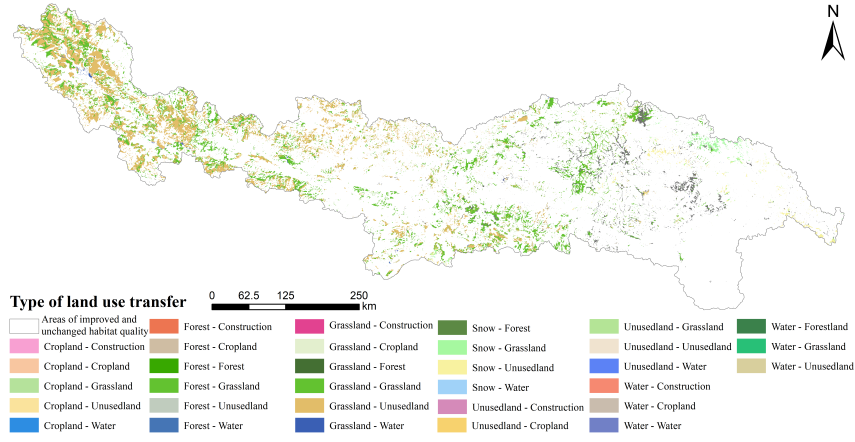
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Main types of land transfer

