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Title	遼西回廊及び遼東半島における伝統村落の空間分布の影響を与えるパターンと差異化された保護に関する研究
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論文題目	Influencing Patterns and Differentiated Protection of the Spatial Distribution of Traditional Villages in the Liaoxi Corridor and Liaodong Peninsula		
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論文の内容の要旨

Traditional villages carry rich historical and cultural heritage and play a vital role in rural revitalization and cultural transmission. However, rapid urbanization has accelerated their decline and disappearance. To explore their spatial distribution and internal patterns, this study focuses on Liaoning Province and conducts a systematic comparative analysis of two representative regions, the Liaoxi Corridor and the Liaodong Peninsula.

This study aims to compare the spatial distribution characteristics and influencing patterns of traditional villages in the Liaoxi Corridor and the Liaodong Peninsula, and to provide an evidence base for differentiated conservation. Methodologically, it integrates GIS spatial analysis, GeoDetector, geographically weighted regression (GWR), and XGBoost combined with SHAP interpretation, thereby enabling a unified comparison of spatial pattern, dominant factors, spatial heterogeneity, and nonlinear interaction effects.

The results reveal clear interregional differences. Traditional villages in the Liaoxi Corridor tend to exhibit a corridor-oriented distribution associated with topography, water systems, and accessibility conditions, whereas those in the Liaodong Peninsula show a more clustered pattern shaped more strongly by ecological and climatic constraints. The results indicate clear regional differentiation in the spatial distribution of traditional villages. The Liaoxi Corridor shows a corridor-oriented agglomeration pattern, with a nearest neighbor index of 0.871, indicating a clustered spatial structure along valleys, transportation corridors, and historical settlement belts. In contrast, the Liaodong Peninsula presents a more dispersed and heterogeneous spatial pattern, with a nearest neighbor index of 1.243, reflecting the influence of complex terrain, coastal conditions, and ecological constraints. The XGBoost-SHAP results further reveal that the dominant influencing factors differ between the two regions. In the Liaoxi Corridor, temperature, distance to city center, humidity, precipitation, and GDP show relatively high contributions, whereas in the Liaodong Peninsula, precipitation, distance to city center, temperature, GDP, and humidity play more important roles. These quantitative results provide evidence for developing differentiated protection strategies rather than applying a uniform protection model.

Based on these findings, this study proposes differentiated protection strategies for the Liaoxi Corridor and the Liaodong Peninsula, with emphasis on regionally adaptive planning, ecological–cultural integration, and infrastructure optimization, so as to promote the coordinated development of traditional village differentiated protection and rural revitalization.

Keywords: Traditional Villages; Spatial Distribution; Liaoxi Corridor; Liaodong Peninsula; GIS Spatial Analysis; Geographic Detector; XGBoost; Differentiated protection

論文審査の結果の要旨

Mr. CAO Han, conducted a systematic comparative analysis of two distinct geographical archetypes: the inland Liaoxi Corridor and the coastal Liaodong Peninsula to addresses the critical issue of traditional village decline during rapid urbanization. He integrated traditional GIS spatial analysis with advanced quantitative techniques, including GeoDetector, Geographically Weighted Regression (GWR), and the XGBoost SHAP machine learning and mapped those analytic results with interactions between natural environmental and human social factors. He utilized a multi-source spatial database, including 52 villages in Liaoxi and 14 in Liaodong, cross-referenced with 13 natural and human indicators. By identifying that villages in the Liaoxi Corridor are primarily shaped by topographical and water-system constraints, while those in the Liaodong Peninsula are governed more by ecological and climatic factors, he provided evidence to propose differentiated protection strategies supporting by comprehensive spatial data.

This is an excellent dissertation, and we approve awarding a doctoral degree to CAO Han.