

The impact of socioeconomic factors on vegetation restoration in karst regions: a perspective beyond climate and ecological engineering

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Abstract

Socioeconomic factors are important parameters that affect vegetation changes in karst areas. Previous studies primarily focused on ecological engineering when analyzing the impact of human activities on vegetation restoration, whereas the impact of socioeconomic factors has been less studied. Using the methods of structural equation modeling and geographically weighted regression, this study quantitatively analyzed the interactive effects of socioeconomic factors on vegetation changes in karst areas using counties as the research unit. The results showed that both the enhanced vegetation index and net primary productivity in the humid karst areas of China showed an increasing trend between 2000 and 2020. Among the socioeconomic factors, non-agricultural economy and rural economy had a positive effect on vegetation change, with maximum path coefficients of the structural equation model of 0.79 and 0.64, respectively; whereas population pressure had a negative impact with a minimum path coefficient of -0.80. Over time, the positive impact of rural economy on vegetation restoration showed an increasing trend, and the path coefficient increased from -0.92 to 0.64; in turn, non-agricultural economy and population pressure showed a decreasing trend. Moreover, because they were affected by the heterogeneity of the karst mountain environment, the impact of various socioeconomic factors on vegetation restoration had obvious spatial non-stationarity. The results of this study will promote our understanding of the mechanism underlying vegetation change in humid karst areas and provide scientific reference for ensuring the sustainability of the ecological effects in these areas.

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