



THEORETICAL ANALYSIS OF INTERACTIVE COUPLED EFFECTS BETWEEN URBANIZATION AND THE ECO ENVIRONMENT

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ABSTRACT

The development of mega-urban agglomerations has triggered the interactive coercion between resources and the eco-environment. The interactive coupled effects between urbanization and the eco-environment in mega-urban agglomerations represent frontier and high-priority research topics in the field of Earth system science over the next decade. In this paper, we carried out systematic theoretical analysis of the interactive coupling mechanisms and coercing effects between urbanization and the eco-environment in mega-urban agglomerations. In detail, we analyzed the nonlinear-coupled relationships and the coupling characteristics between natural and human elements in mega-urban agglomerations. We also investigated the interactive coercion intensities between internal and external elements, and the mechanisms and patterns of local couplings and telecouplings in mega-urban agglomeration systems, which are affected by key internal and external control elements. In addition, we proposed the interactive coupling theory on urbanization and the eco-environment in mega-urban agglomerations. Furthermore, we established a spatiotemporal dynamic coupling model with multi-element, multi-scale, multi-scenario, multi-module and multi-agent integrations, which can be used to develop an intelligent decision support system for sustainable development of mega-urban agglomerations.
