

Can the principle of urban-rural gradients be applied to analyze the linkages between ecosystem services and socioeconomics in human-environmental systems? Case studies from Germany and China

Ying Hou^a, Felix Müller^a, Bo Li^b and Franziska Kroll^a

^a *Institute for Natural Resource Conservation, University of Kiel, 24118, Kiel, Germany*

^b *College of Resource Science and Technology, Beijing Normal University, Beijing, 100875, China*

E-mail: yhou@ecology.uni-kiel.de

Abstract: The issue of human-environmental interactions in urban-rural transition areas has been drawing increasing concerns from environmental researchers and managers. Traditionally developed to sketch the characteristics of ecosystems in urban-rural areas, the concept of urban-rural gradients is proved to be applicable for revealing the spatial dynamics of socioeconomic features. Ecosystem service is a well developed concept to connect natural and social systems by linking ecosystem integrity, function and human well-being. Despite its encouraging performance in combining environmental and human systems, ecosystem services and the corresponding impact from socioeconomics are not considered enough in the context of urban-rural areas.

In order to cope with this problem, we will combine these two concepts, delineate the ecosystem service gradients in our urban-rural case areas and examine their relationships with socioeconomic gradients. Two typical urban-rural gradients will be included in our research: Halle-Leipzig area in the east of Germany with dual-core urban areas and regular environmental changes and Kunming urban-rural area in the southwest of China, which sprawls from a single-core urban area and grows across uneven space with irregular physical surroundings. Our work will firstly select ecosystem provisioning and regulating service indicators as well as socioeconomic indicators for these two case areas. After quantifying these indicators, we will detect their spatial characteristics and find out the ecosystem services gradients and socioeconomic gradients of the two areas. Then we will investigate the qualitative and quantitative correlations between ecosystem service gradients and socioeconomic gradients of the two areas respectively. Lastly we will compare the ecosystem service and socioeconomic gradients of the two case areas and describe their characteristics. Our research will help to exam the applicability of the urban-rural gradient principle in the perspective of ecosystem services and develop the approaches to better capture human-environmental interactions in urban-rural areas.

Key words: urban-rural gradient, ecosystem services, socioeconomics, human-environmental interactions, case study comparison

Highlights: Quantification of ecosystem services and socioeconomic indicators for urban-rural case areas; Delineation of ecosystem services and socioeconomic gradients; Revelation of the correlations between ecosystem services and socioeconomics; Comparison of German and Chinese case areas

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