

Shifts of the Land-based Human Activities in Circum Bohai Sea Coastal Region in the Early 21st Century—From the Perspective of Land Use Change

Xiyong HOU¹, Liangju YU¹, Qingshui LU¹ and Qianguo XING¹

¹Yantai Institute of Coastal Zone Research, Chinese Academy of Sciences, Yantai, China

Land-based human activities play critical roles in environmental and ecological changes in enclosed coastal seas, especially coastal regions where there're high population density and extensive human activities. Bohai Sea is one of the most typical enclosed marginal seas in East Asia where there're the most rapid urbanization and industrialization process and social-economic growth in the past decades on the world. At the same time, the phenomenon of environmental and ecological deterioration is very serious in Circum Bohai Sea Coastal Region (CBSCR). Therefore, it will be meaningful works and indispensable measures to study and adjust our land based activities in order to ameliorate the environment deteriorations and improve the ecology in CBSCR.

In this paper, from the perspective of land use changes, we studied the dimensions and extensions of land-based human activities as well as its spatial-temporal dynamics in CBSCR in the early 21st century. Land use data interpreted based on Landsat images in 2000 and 2005 are available. And it was reclassified into nine kinds of land use which include paddy field, dry farmland, forest, grassland, water area, urban area, rural resident, traffic and mine, and unused land. Spatial extent covers Beijing, Tianjin, Liaoning, Hebei and Shandong was chosen as the study area. Spatial-temporal patterns of land use change were studied by statistical method and GIS spatial analysis techniques.

It turned out that, dry farmland, forest, grassland and rural resident has being the top four land use type in CBSCR, however there're distinct regional divergences among the five provincial administrative districts. As for the dynamic changes of land use in the early 21st century, overall, amounts of urban area, traffic and mine, rural resident and water area have increased greatly while the other five kinds have decreased sharply. However, at the provincial level, the spatial-temporal patterns and dynamic characters were very different from each other's. In detail, fast urbanization, increase of traffic and mine, and decrease of paddy field were the common characteristics in all the five provincial districts. However, changes of dry farmland, forest, grassland and so on had much complicated spatial characters.

Basically, the land-based human activities in CBSCR had evolved toward the direction being adverse to the environmental management of the enclosed coastal sea in the early 21st century. Especially the extensive process of urbanization accompanied by sharp decrease of forest, grassland and cultivated land would greatly exacerbate the environmental and ecological deterioration trend in CBSCR.

Contact Information: Xiyong HOU, Yantai Institute of Coastal Zone Research, Chinese Academy of Sciences, ChunHui Road 17#, Laishan District, Yantai, Shandong, P.R. China. Post: 264003, Phone: +86 0535 2109196, Email: xyhou@yic.ac.cn