

Landuse/Landcover Change and Climate Fluctuation in Headwater Region of Chinese Yellow River

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Headwater region of Chinese Yellow River located at north-west part of Tibetan Plateau, and has a fragile eco-system, moreover, the quality of eco-environment is tightly related to the social and economical development of regions around the middle and lower reach of Yellow River. Since 1990s, A lot of environmental problems aroused in this region such as soil erosion, grassland degradation, land desertification, and upriver zero-flow event. The eco-environment has been rapidly deteriorating. With the subpixel unmixing and image classification technique based on Artificial Neural Network algorithm, and using NOAA-AVHRR data of 1990s and the latest EOS-MODIS data since 2000, we studied in detail about process and trend of landuse and landcover change of Headwater region of Yellow River, from 1990 to 2003. Meanwhile, we have investigated the social economical development and human activity history in the late 20th century at this region. We also collected and analyzed climatic and hydrological data of this region since 1990, and then compared these two results with landuse/landcover change study results. After comparison we found that, the degradation of the eco-environment caused by the climate change is about the most common case of the environmental problems in the Headwater region of the Yellow River. The changes of some meteorologic elements such as the persistent increasing temperature and the durative reduced precipitation directly or indirectly resulted in some ecological and environmental problems like the degeneration of permafrost, land desertification and upper Yellow River zero-flow events. Furthermore the human being plays a more and more important role to these eco-environmental problems while their controllable region expanding. Some of their conscious or unconscious actions such as over grazing and uncontrolled placer mining deteriorate these eco-environmental problems like soil erosion and grass degradation. Climate change and human activity have different function in different regions, but relatively, climate change is the main reason degenerate the eco-environment in the Headwater region of the Yellow River.