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Study on the Vegetation Change and its Cause in Arid and Semi-arid Region in East Asia

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Recently, GIMMS (Global Inventory Modeling and Mapping Studies : 1982-2006) NDVI data set was created and published, which enables to capture vegetation changes with high accuracy than previous NDVI data set such as PAL, and analysis of vegetation changes until recently become possible. Especially in arid and semi-arid China, it is thought that there was a big change of land-use form by the policies concerning anti-desertification activities since 2000. Also, a response of vegetation to the climate change such as global warming and land-use change resulted from the policies, are different in the region, so it is important to evaluate the "land vulnerability" in a region with the latest data set in making the future land-use plans. The purpose of this study is to analyze vegetation changes and its factor with GIMMS dataset in Eastern Asia mainly the Inner Mongolia, China, where the desertification is the most serious concern.
As a result of analyses, a general spatial distribution pattern of vegetation change was obtained showing a clear spatial differentiation. Also, since 2000, in the mostly steppe region and the forest region in Inner Mongolia, vegetation change tendency shifts from a former decreasing trend, and the recovery of vegetation is admitted. In the mostly meadow steppe and temperate steppe in the steppe region, an increasing trend including significant increase is extracted since 2000. Especially the important cause is thought to be artificial influence factor in addition to the climate variation. In the forest region, it is suggested that artificial factor influence vegetation change. In the desert steppe and desert region, a decreasing trend including significant decrease is extracted since 200 0. In these ecosystems, a positive correlation is seen in precipitation and a negative correlation is seen in temperature, and this indicate that a decrease of soil moisture caused by global warming and decreased precipitation is a great factor. Myneni et al.(1997) revealed vegetation has been activated by global warming in the mid- and high latitude areas, but in desert steppe and desert in arid and semi-arid China, it is possible to make vegetation degrade by global warming.

Keywords: vegetation change, arid and semi-arid region, East Asia, GIMMS, China, Inner Mongolia