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“Resilience of agricultural systems against crises”

Agricultural Land Use Change, Resource Competition and Conflict in the Tarim Basin, Xinjiang, China

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Abstract

The Tarim River Basin is a continental arid region in the Northwest of China, which is characterised by extreme vulnerability. Rainfall is very rare and thus all kind of human activities, as well as the natural ecosystems depend on the water, which is supplied through snow- and glacier-melt to the Tarim River. A tremendous land use change can be observed in the last decades, which puts severe pressure on natural resources. This publication examines the changes in agricultural land use in the last decades, investigates the causes of change, and elaborates the consequential resource use conflicts. Statistical yearbooks of the local regions, literature review and data obtained through expert interviews and a stakeholder workshop constitute the data base for the analysis. Land use change was assessed for the four administrative regions along the Tarim, namely Bayangol and Aksu prefecture, as well as the Division 1 and Division 2 of the military farms. In total the area for annual crops nearly doubled to more than one million hectare from 1989 to 2009, with the strongest increases in cotton area. The increase was significantly higher outside the military farms, which can mainly be attributed to the strong population increase in the same period. Furthermore the “Grain-for-Green” policy promotes the establishment of perennial production systems, especially orchards. This led to an increase of orchard area from 40,000 to 300,000 hectare in total, again with the highest increases in Aksu prefecture. As orchards have about double the water demand compared to annual crops, the promotion of perennials further aggravates the competition for water, not only between agriculture and the natural vegetation, but also between upstream and downstream farmers. As a consequence limited water availability restricted the expansion of agricultural land in the Division 2, which is located at the lower reaches of the river. This has a direct impact on the agricultural GDP, which increased at a four times lower rate in Division 2 compared to the other three regions. Ultimately a population decrease in the lower reaches can be observed in the last years, with farmers being re-settled to other parts of Xinjiang.

Keywords: China, cotton, grain-for-green, land use change