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Changing Water Use Institutions and Farming Strategies as a Response to Aquifer Depletion - A Case Study in Minqin County, Gansu Province, China

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Abstract

The regulation of groundwater extraction to avoid exhaustion of the resource is a vexed question worldwide. It also arises in North China where groundwater use has developed rapidly over the last few decades, in some regions resulting in aquifer depletion. Minqin County is a remote rural area in the North of Gansu Province in the North West of China, confronted with aggravating water scarcity due to the rapid withdrawal from groundwater resources. The county is located in the delta region of the landlocked Shiyang river basin. As a result of low rainfall (annual precipitation of 100–200mm) agriculture depends on irrigation. Since the 1960s the region's surface and subsurface water inflow has been diminished due to increasing water use upstream. Subsequently the abstraction of groundwater resources has been intensified to compensate for the decreased water inflow. This development was enabled by the availability of cheap drilling and pumping technologies.

Since the 1970s the increased use of groundwater resources led to falling water tables and caused related problems, such as higher pumping costs, groundwater mineralisation, desertification and exhaustion of the resource. To protect the groundwater resources the government has recently introduced a policy in Minqin County which restricts the use of groundwater for the agricultural sector by closing down wells and limiting the area of cultivated land.

In our empirical study the response of water users to aquifer depletion will be analysed through multi-level stakeholder interviews. Special focus will be given on the change of farmers' behaviour after the implementation of the new policy. In the course of 2010 both village leaders, water managers and farmers will be interviewed to understand the institutional arrangements and changes in farming strategies since the intensification of groundwater use and the implementation of the policy. Finally a conclusion may be drawn on the viability of the policy for other regions in North China, and the impact of possible alternatives to the current policy may be discussed.

Keywords: Aquifer depletion, farming strategies, groundwater management, institutions, North China

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