Sino-Swiss Cooperation on Groundwater Under a Changing Climate

Rehabilitation and management strategy for over-pumped aquifers

Heihe River Basin Pilot Region, Gansu Province, China © Swiss Water Partnership

Country/Region

China

Making the invisible visible – the challenges posed by groundwater over-pumping in arid regions in the context of climate change

Groundwater systems provide water security by acting as natural buffers against the effects of drought. The lack of specific knowledge on the volume of water extractions from aquifers and on the rate of aquifer recharge has limited the ability to develop appropriate polices and to practice best management at the aquifer level. The quaternary aquifer of the north China plain – where 30 per cent of the country's grain is produced – is one of the world's largest aquifer systems.

As a consequence of severe overexploitation, the water table has been dropping at a rate of 2 metres per year. Such overuse of aquifers is all too common across the globe. About a quarter of the 1000 km^3 pumped annually from aquifers worldwide is not renewed by recharge and thus leads to the depletion of aquifers.

Sustainable management of natural resources

Duration

01.09.2018 - 31.12.2022

Financial contribution of SDC

CHF 2,816,000

Project Objectives

The main purpose of the project is to preserve or restore the aquifer's capacity to mitigate the effects of drought and to insure against expected climate extremes. As an adaptation measure, the project responds to climate variability and will serve as a case study intended to guide others in the development of such systems.

The beneficiaries include farmers in the pilot project region, local water user associations and water authorities, national research and policy institutes, and ultimately those who use the case study.

Expected Outcomes

- Development of Chinese capacity to establish and maintain real-time groundwater monitoring and control systems
- Development and implementation of policy options for sustainable management of groundwater and water-efficient agricultural practices
- Dissemination of knowledge and best practices for replication at the national, regional and global levels

Strategy

The core element of the project is the implementation of a real-time groundwater monitoring, modelling and controlling system designed to provide the information necessary to develop water-saving policies and to manage an aquifer sustainably, thus restoring the aquifer's capacity to maintain an effective buffer against increasingly frequent and severe climate extremes. Stakeholder dialogues will develop policy options to be implemented by local authorities.

Dissemination of the case study will provide the opportunity for policymakers and water managers in other arid regions experiencing groundwater depletion to use the knowledge gained through the project to develop their own systems.

Submersible groundwater pump tapping aquifers for irrigation in Guantao County
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Partners

Swiss Federal Institute of Technology in Zürich (ETH)

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