

Groundwater use management using existing wells to cope with drought

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Abstract

The study aims to develop scenarios for efficient groundwater use using existing wells in order to prepare for an eventual drought. In the recent decades, droughts are not only intensifying, but they are also spreading into territories where droughts used to be less intense and relatively infrequent. With the increasing disaster, efficient groundwater use is urgently needed not only to prevent the problem of groundwater depletion but also drought risk reduction. Thus, the research addressed the problem of efficient aquifer use as source of water during drought and emergencies. The research focused on well network system applied to Yanggok-ri in Korea using simulation models in visual MODFLOW. The approach consists to variate groundwater pumping rate in the most important wells used for irrigation across the study area and evaluate the pumping effect on water level fluctuation. From the evaluation, the pumping period, appropriate pumping rate of each well and the most vulnerable wells are determined for a better groundwater management. The project results divide the study area into two different regions (A and B), where the wells in the region A (western part of the region) show a crucial drop in water level from May to early July and in August as consequence of water pumping. While wells in region B are also showing a drawdown in groundwater level but relatively less compare to region A. The project suggests a scenarios of wells which should operate considering water demand, groundwater level depletion and daily pumping rate.

Well Network System in relevant project, by pumping in another well where water is more abundant and keep the fixed storage in region A, is a measure to improve preparedness to reduce eventual disaster. The improving preparedness measure from the project, indicates its implication to better groundwater management.

Keywords : Visual MODFLOW, Well network system, Drought

Acknowledgment

This study is supported by a Korea Environmental Industry & Technology Institute (KEITI) grant funded by the Ministry of Environment through the Demand Responsive Water Supply Service Program(No.146526).

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