Sustaining groundwater irrigation for food security in the northwest region of Bangladesh

Researchers and policy makers from Bangladesh and Australia are working together to understand the sustainable level of water use, particularly groundwater use, for irrigation in the northwest region of Bangladesh.

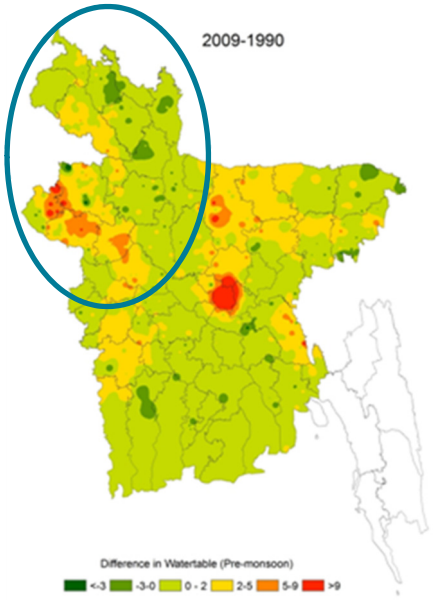
We will estimate water demand for current and future cropping scenarios, and estimate the sustainable limit of water use in the region by water balance and groundwater modelling.

The proposed work program will help increase water and food security in Bangladesh, particularly in the northwest region, through improved integrated water resource management and agricultural (hence food) production. This will increase food security and economic prospects, especially amongst the poorest, and this in turn would have significant benefits for women and girls.

Background

The northwest region has the largest areas of cropping in Bangladesh and is crucial to Bangladesh's recent attainment of rice grain food security. The northwest region alone supplies about 35% of the irrigated *Boro* rice and more than 60% of the wheat and maize of the whole country. The northwest region is also the region of greatest concern over falling groundwater levels, particularly in the Barind area, which have resulted in a lack of access to water for drinking and irrigation in some areas. However, it is not clear whether the declining groundwater levels result from an observed decline in rainfall, or from excessive use, or from some combination of these and possibly other factors.

To address this challenge, the Australian Government, through its Department of Foreign Affairs and Trade (DFAT) Sustainable Development Investment Portfolio, is funding a project involving CSIRO and several Bangladeshi partners.



The northwest region of Bangladesh is the focus for our project. It is the most productive agricultural region in the country, and also the region of greatest concern over the sustainable use of groundwater. The red areas on the map highlight where the groundwater table has dropped >9m during the period 1990 to 2009

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Project aims

The project aims to define the sustainable level of water (particularly groundwater) use for irrigation and their impacts on the socio-economy and livelihood of the farmers including women in the northwest region of Bangladesh.

The current phase of the project began in November 2016 and will continue until June 2020.

Research approach

1. Developing catchment/district scale understanding of the surface water and groundwater resources through water balance analysis, and surface water and groundwater modelling
2. Examining and modelling the trends in cropping patterns and future cropping scenario
3. Examining the impact of future water availability on the irrigated agriculture, regional socio-economy, livelihoods, women and girls
4. Conduct a social (gender-disaggregated) cost-benefit analysis of potential investments or policies.

The research will be carried out through close partnerships with other projects in the region including the Sustainable and Resilient Farming System Initiative (SRFSI), and Improving dry season irrigation for marginal and tenant farmers in the Eastern Gangetic Plains funded by the Australian Centre for International Agricultural Research (ACIAR).

Expected project outcomes

The project will contribute to an improved understanding of the water resource in in the northwest region, and thus provide a sound scientific basis for discussing sustainability and development. The project will generate critical new knowledge by assessing the water balance of subregions within the northwest region and, in particular, by estimating a sustainable level of groundwater use under current and future likely climate.

The proposed work program will help increase the water and food security in Bangladesh, particularly in the northwest region, through improved integrated water resource management and agricultural (hence food) production. This will increase food security and economic prospects, especially amongst the poorest, and this in turn would have significant benefits for women and girls.

Project partners

1. Commonwealth Scientific and Industrial Research Organization (CSIRO) (Lead)
2. Institute of Water Modelling (IWM)
3. Bangladesh Agricultural University (BAU)
4. Bangladesh Agricultural Research Institute (BARI)
5. Barind Multi-purpose Development Authority (BMDA)

In addition, we will work with the Water Resources Planning Organization (WARPO) as a policy partner.

Irrigating *Boro* rice from groundwater in north west Bangladesh

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