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# Application of remote sensing information for assessing excess water on crop productivity and associated costs: A case study in northwest Bangladesh

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Rapid expansion of irrigated agriculture and decline of rainfall mainly in the dry period have resulted in a decline in the groundwater table and depletion of groundwater stores in many countries including Bangladesh. We explored the application of remote sensing information for assessing the effects of excess water on water productivity and irrigation costs for BRRI dhan 28 (a common variety of dry season (boro) rice). The excess water lifted in five selected sub-districts was calculated using data on the gross irrigation water requirement (GIWR) and total lifted water for irrigation using remote sensing information, empirical models and direct method. GIWR ranged from 139.8 to 204.2 million m3 considering a conveyance and distribution loss of 10% of total. On average, 80% of the lifted water was necessary to meet irrigation water requirements; the remaining fifth was termed "excess water". The cost of excess water was estimated to be $28.2-$90.8 per hectare from deep tubewells and $97.0-$129.4 per hectare from shallow tubewells. Irrigation costs were reduced by about 25% and average yields increased by 8.1% to 13.7% when the Alternate Wetting and Drying (AWD) method was used. Use of excess water in AWD fields was also much lower than in traditional fields in all sub-districts. On average, only 10% excess water to GIWR was lifted when AWD method followed. However, modern water management technologies like AWD are likely to be less effective unless volumetric irrigation methods are used. Awareness campaigns and advocacy of modern irrigation management concepts such as low water demanding high value crops, volumetric water charging system can improve water-use efficiency by preventing excess groundwater use and reduce associated costs.

## Biography

Nepal C Dey has completed his PhD from Tottori University, Japan after completion of MSc in Water Resources Engineering from Bangladesh University of Engineering and Technology, Dhaka. He is the Senior Research Fellow of Research and Evaluation Division, BRAC, a premier #1 NGO in the world. He has relatively a long experience in research, teaching and consultancy on water and environmental issues with public, private and UN organizations. He is a Professional in Water Resources Engineering. He has published more than 50 papers in reputed journals and book chapters and has been serving as an Editorial Board Member of repute. His research interest includes: remote sensing in environment and sustainability of water resources.

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