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Development of Conjunctive Use Model for Lower Gandak Basin (PART-I)

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ABSTRACT

A conjunctive use problem involving judicious use of surface and groundwater in the Habibpur region of Gandak command has been attempted in the study. The area is characterized with insufficient surface water during Rabi and Garam seasons and excess surface water condition in Kharif season. The study area falls in the Gandak command and lies between the river Gandak and Vaishali Branch Canal (VBC), one of the branches of the Gandak canal system. The Habibpur sub-distributary from VBC conducts water to the study area. The canal system provides water during Kharif season and only 35-45 days during Rabi season and no flow during summer season when it is extremely needed for irrigation. This uneven availability of surface water in different seasons results in waterlogging and poor agricultural output from the region.

As groundwater potential in the area is yet to be fully explored, it is proposed to use groundwater resources in the region. This can provide two fold advantages for the region.
(i) to increase the irrigation water availability for Garam and Rabi crops and (ii) subsequent replenishing of groundwater in Kharif season. This would not only improve the waterlogging conditions but also bring more cultivable area under agricultural practices. Increasing the cropped area in different seasons would also improve water logging conditions in addition to increasing agricultural productivity of the area.

A groundwater flow model has been developed for the region to simulate the groundwater behaviour taking into account the surface water groundwater interaction under various external stresses. The calibrated model has been used to predict the waterlogging conditions under increased crop area coverage. The model has also been used to forecast the extent of waterlogged areas on utilizing the groundwater resources of the area.