



Regional variability of farmer decision making and irrigation water use: insights from a data-scarce region of North India

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Over the last fifty years, changes in agriculture brought about by the Green Revolution have transformed India from a famine-prone, drought-susceptible country into the world’s third largest grain producer and one of the most intensively irrigated parts of the globe. Regionally, cheap energy, subsidised seeds and fertilisers, and in some areas Government purchase guarantees for grain promote the intensification of farming. While this allows farmers to survive, it also aggravates the drain agriculture is having on resources, particularly energy and water. Analysis at a regional scale, however, masks the considerable spatial variability that exists on a more localised level and must be taken into consideration to understand correctly aggregate system response to policy, hydrologic, and climatic change.

In this study we present and analyse the results from over 100 farmer interviews conducted in the data-scarce districts of Jalaun and Sitapur on the Gangetic Plains of Uttar Pradesh during the post monsoon period of 2013. Variables such as the volumes and timing of irrigation water applied, sources of water, methods of abstraction and irrigation, and costs incurred are mapped, using qualitative data analysis and GIS. Large differences between the districts emerge, for instance in the region of Jalaun where cheaper canal water is available in addition to groundwater. This has enabled farmers to afford more water efficient technologies such as sprinklers, a practice not found in Sitapur which depends almost exclusively on more expensive diesel pumps. Results are used to delineate the spatial variability in water use practices, along with farmer behaviour and decision making. The primary data are compared with socio-economic information taken from regionally produced statistical abstracts. The combined data are used to identify the main drivers that influence farmer decision-making, which is in turn leading to groundwater overdraught in many parts of North India.

Finally, the importance of understanding and modelling farmer behaviour for policy development, and the significance of this in the face of growing population, changes in socio-economic conditions, and climate change are discussed. Taking these variables into account is necessary in creating a transparent, socially acceptable and economically viable balance between sustainable water resources and farmer livelihoods.