



## **Strategies for transdisciplinary research on peri-urban groundwater management in the Ganges delta**

Leon Hermans (1), Wil Thissen (1), Sharlene Gomes (1), Poulomi Banerjee (2), Vishal Narain (2), Mashfiq Salehin (3), Rezaul Hasan (3), Anamika Barua (2), Shah Alam Khan (3), Samir Bhattacharya (2), Remi Kempers (4), Parthasarathi Banerjee (5), Zakir Hossain (6), Binoy Majumdar (5), and Riad Hossain (6)

(1) Delft University of Technology, Faculty of Technology, Policy and Management, Delft, the Netherlands (l.m.hermans@tudelft.nl), (2) SaciWATERs, South Asia Consortium for Interdisciplinary Water Resources Studies, Hyderabad, India, (3) Bangladesh University of Engineering and Technology, Institute of Water and Flood Management, Dhaka, Bangladesh, (4) Both ENDS, Amsterdam, the Netherlands, (5) The Researcher, Kolkata, India, (6) Jagrata Juba Shangha (JJS), Khulna, Bangladesh

Transdisciplinary science transcends disciplinary boundaries. The reasons to engage in transdisciplinary science are many and include the desire to nurture a more direct relationship between science and society, as well as the desire to explain phenomena that cannot be explained by any of the existing disciplinary bodies of knowledge in isolation. Both reasons also reinforce each other, as reality often features a level of complexity that demands and inspires the combination of scientific knowledge from various disciplines. The challenge in transdisciplinary science, however, is not so much to cross disciplinary boundaries, but to ensure an effective connection between disciplines. This contribution reports on the strategy used in a transdisciplinary research project to address groundwater management in peri-urban areas in the Ganges delta.

Groundwater management in peri-urban areas in rapidly urbanizing deltas is affected by diverse forces such as rapid population growth, increased economic activity and changing livelihood patterns, and other forces which result in a growing pressure on available groundwater resources. Understanding the intervention possibilities for a more sustainable groundwater management in these peri-urban areas requires an understanding of the dynamic interplay between various sub-systems, such as the physical groundwater system, the water using activities in households and livelihoods, and the institutional system of formal and informal rules that are used by various parties to access groundwater resources and to distribute the associated societal and economic costs and benefits.

The ambition in the reported project is to contribute both new scientific knowledge, as well as build capacity with peri-urban stakeholders to improve the sustainability and equitability of local groundwater management. This is done by combining science and development activities, led by different organizations. The scientific component further consists of three sub-components. The connection between these scientific disciplines is made by using a multi-polar strategy. Each research works with a different framework rooted in its own scientific discipline, featuring its own concepts and theories: a hydrogeological framework, a sustainable livelihoods framework and an institutional development framework. Rather than forcing these frameworks into a new framework that is perhaps only fit for the purpose of this single research, the disciplinary frameworks are left in-tact, but are connected by a translation of key variables from one framework to the other. Often, what is an exogenous variable in one framework, is endogenous in another, and vice versa. Investigating the connections between these different poles would require an integrating perspective, for which again different scientific integration perspectives will be explored, rooted in different scientific traditions. The poster will present this framework and the initial findings and experiences with this transdisciplinary research strategy.