

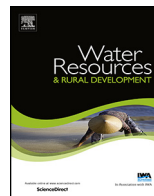


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Many issues, limited responses: Coping with water insecurity in rural India



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ABSTRACT

We present empirical evidence of coping strategies practiced in response to water insecurity and emerging climate variability in a dry, sub-humid rural district in India. We find non-climatic factors to be largely responsible for the existing water insecure conditions and, as perceived, climatic variations are found to magnify the misery. The causes and impacts of water insecurity result in a complex vicious cycle, pushing rural livelihoods and domestic life to further deprivation and poverty. Counter responses, mostly coping strategies, are found to be spontaneous, reactive and are largely motivated by crisis, which often degrades the resource base, and are found to be detrimental to the health and well-being of the studied communities. We question the advisability of water supply provisions in rural areas that fail to acknowledge the water demands of rural communities. Localized initiatives, including location specific strategies, must be formulated with effective community participation and in conjunction with other developmental programs to ensure water security in rural areas.

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1. Introduction

Over the past decade, water security has gained significant attention, thereby improving the understanding of the concept by both policy makers and academicians. Many factors influence water security, including hydrology, population growth, increased migration, contamination of water resources, increased per capita water consumption, over-abstraction of groundwater, and climate change

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(Evangard et al., 2011; Vörösmarty et al., 2010). Hence, ensuring water security is governed not only by the availability of safe water in sufficient quantity, but also by its equitable spatial distribution, sustainable use to meet different human needs, and resilience to uncertain and sudden risks that include variability in climate (Grey and Sadoff, 2007). Climate change is likely to compound water insecurity, mainly for the poor and marginalized population who lack proper infrastructure and governance to manage, store and supply water. The impacts are hypothesized to be more pronounced in rural areas, as rural economies are highly dependent on agriculture, which exclusively relies on the availability of sufficient water volume.

Water security has physical, social, economical and ecological aspects (Klopprogge and Van der Sluijs, 2006; van Aalst et al., 2008). Achieving water security requires community level understanding and response, as processes at the local level influence global actions (and vice versa) (Wilbanks and Kates, 1999). Local observations often are absent in scientific studies and models (Wilbanks and Kates, 1999; van Aalst et al., 2008). Although numerous studies have demonstrated the significance of perception (Alessa et al., 2008; Grace et al., 2013; Haldar et al., 2012; Murtinho et al., 2013), and many individuals make decisions based on perceptions rather than measured variables, most predictive models regarding the use of water resources do not include social components, such as perceptions (Alessa et al., 2008).

Perceptions influence decisions to act or not over both short- and long-terms (Alessa et al., 2008) and are key components of adaptation. Adaptation strategies are long-term and planned responding to expected continued decline or uncertainty in future crop productivity and food production. On the other hand, the coping strategies of communities, mostly rural poor and marginalized, are aimed at responding to short term shocks, and are unplanned (Nuorteva et al., 2010), autonomous and reactive rather than strategic (Bates et al., 2008; Smit et al., 2000). With a heavy dependence on water and other natural resources for their food and health security, livelihood and well-being, these coping strategies are generally applied in socio-economic sectors to overcome the immediate crisis and are just for *survival* (Vogel, 1998). Most adaptation studies to date focus on perceptions of farmers and their adaptation to climate change (Ashraf and Routray, 2013; Baudoin et al., 2014; Dang et al., 2014; Dieye and Roy, 2012; Gandure et al., 2013; Mertz et al., 2009). Although such studies are important to design mitigation strategies, these are less relevant in terms of providing critical insights for effective adaptation strategies at the household or community level. Moreover, studies specifically focusing on adaptation to water scarcity and insecurity are scarce. Limited studies focus on the perception and adaptation/coping strategies of women, who are the principal carriers of water and plays one of the most significant roles in ensuring water security at a household scale.

Water security assessment at the national scale can mask significant variation in security at the local scale (Vörösmarty et al., 2010). A multiple scale assessment – from the local to national – can better examine the country water security for both human and ecosystem needs (Cook and Bakker, 2012). In the context of the present study, water insecurity is considered high when there is lack of adequate and safe water supply throughout the year, and the distribution of water impacts on health, livelihoods, ecosystems and production are unequal. In addition, “water security has always been a societal priority – in its absence people and economies have remained vulnerable and poor” (Grey and Sadoff, 2007).

The primary goal of this study is to assess local perceptions and understanding of water insecurity in a rural area in India. Community views were also sought regarding localized climate variability and how the synergy of climate variability and water insecurity increases the socio-economic adversity of the rural impoverished population. We argue that more than climatic and other natural factors, management factors affect water security in rural areas, and most of the strategies practiced by local communities are inadequate and unsustainable. The remaining gap in perceiving the changes and the adaptation capacities of rural communities requires policy intervention that will enhance water security in rural areas.

2. Research methodology

2.1. Study area

Purulia, a rural district in the state of West Bengal, India, suffers from utter poverty and distress, which intensifies with frequent water crisis and its impact on the only livelihood of the local people

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