

## **Book Review**

### **A call for convergence of disciplines for Integrated Water Management**

#### **Water, Ecosystems and Society: A confluence of Disciplines**

By Jayanta Bandyopadhyay

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In the wake of water scarcity, climate vulnerabilities and mounting environmental degradations, water issues are becoming more complex posing newer challenges for better governance and management. The complexity and new challenges require blending of knowledge from different disciplines that can bring valuable information about the possibilities and consequences of decisions and actions towards an impending solution. Interdisciplinary approach, therefore, is essential in laying the scientific foundation for solving complex problems that need integration across the biological, physical and social science disciplines in a very broad sense. The book under review revolves around this theme and provides an approach to the generation of interdisciplinary knowledge around water and ecosystem. Calling the water systems management - a confluence of disciplines, the author has put forward interdisciplinarity as a major agenda for building perspective around water.

To support the main argument of the book and bring in an interdisciplinary outlook in the planning and management of water resources, the book brings in four intense and well researched papers which have relevance in present day ecosystem management. The first chapter, being an introductory one, explains the need for interdisciplinary knowledge for water while setting the agenda for future research and action through providing signs of probable research gaps. Three chapters that follow the introductory chapter indicate how these gaps could be filled and then elaborate further on covering some areas in detail.

Chapter one – interdisciplinary knowledge on water systems maps the gap of water science and policy in India to answer the questions – why Indian water management has functioned with disciplinary brilliance but has not been able to go beyond the disciplinary boundaries? The author discusses the lack of institutional incentives as a root cause for not being able to cross disciplinary boundaries and to question the status quo of present water management thinking and practices. The author expects that the institutional mechanisms for facilitating newer

knowledge for water would feed into the practical world and be used for fulfilling the larger cause of poverty alleviation. Nine interdisciplinary research themes are identified which could be used as the framework for research on water systems. They border on eco-hydrological knowledge on the surface and ground water systems, comprehensive assessment of water related projects, application of economics in water policy and governance, ecological perspectives of extreme events, social dimensions of water systems use and local institutions, technological options for water systems management, global change scenarios and adaptation and water laws and entitlements.

Chapter two focuses on the eco-hydrological perspective on floods and builds the argument around the fact that floods are part of the natural process and have many beneficial ecosystem contributions that could provide important economic opportunities. This is against the classical engineering understanding that looks at floods as disasters which need to be controlled. Providing a detailed and technical understanding of the causes and conditions of flooding, the author gives a framework for a holistic and ecological perspective of flood moving away from mere engineering to an interdisciplinary analysis. Providing a typology of floods in India, the author explains the detailed eco-hydrological processes associated with the flood systems and as an important ecological function. Extreme events, as associated with floods, are not only rare but occur more because of the human-induced drainage congestions and less due to natural occurrences. This view is necessary to counter the reductionist view of floods that is attributed to natural disaster which is needed to be controlled through engineering marvels. These views fail to recognize floods as an integral part of riverine processes that performs important ecosystem services such as breeding of fish population, control of salinity ingress, supply of biomass, cultivation of tropical wetland crops, livestock grazing, groundwater recharge.. etc to name a few. So what is the idea of living with floods in south Asia? The author explains the adaptive approaches and locally evolved flood survival norms as 'holistic, locally based, participatory and integrated approach that recognizes the importance of floods in maintaining ecosystems and their roles in human society' (pp-87).

Chapter three deals with a rather contentious issue of valuation and pricing of water and its policy implications. The author takes lead largely from economics and ecological economics and applied this to the valuation of water. The chapter is largely based on the critique of the institutional economists who are not able to quantify the transaction costs 'due to their improper delineation' (pp 102). The chapter thus proposes for more objective instrument for policy makers in terms of water valuation. The first part of the chapter talks about valuation as a tool which can be used for resolution of water disputes and in providing economic services of water (for agriculture, industrial and domestic water sector). The second part deals with the valuation of ecosystem services of water using a detailed account of different theories of

valuation. It focuses on the scarcity value of water due to shortage of resources. There is a difference between the scarcity value and the total market value and the total cost of water should highlight upon both, on scarcity value as well as opportunity cost of water which, according to the author, should guide allocation decisions within and across water sub-sectors. The author claims that 'scarcity value is a holistic measure of not only the state of the resource, but also of every type of intervention that can occur on the resource, which rarely gets captured by the notion of scarcity' (pp 132). The chapter is interesting to read for its nuanced understanding and elaboration of water pricing tool but the core question of 'getting the prices right' still remains one of the dogmas of commercialization of water. The premise of the pricing of water corresponding to the cost of the service all the way along the supply curve does not hold good in reality though extensively discussed in text books. The recourse to this technical jargon not only leaves many public service advocates infuriated but also helpless against rapid water price increases for poor people. The economics of water allocation and pricing in developing world shows that it is an immensely political process and most often do not follow the impeccable economic logic. More interdisciplinary work is needed on pricing as a tool for water allocation and management.

Chapter four focuses on the much discussed and ambitious river-linking project of India put forward by the Bharatiya Janata Party led National Democratic Alliance. The project was scrapped by the United Progressive Alliance government in 2009 when the present book was under publication. The project was conceived as a part of the inter-basin transfer of water and proposed to link 14 Himalayan rivers in the north and 16 peninsular rivers in South India. The benefits of the scheme was shown in terms of adding 35-37 million hectares of irrigated land, generating 34,000 million kilowatts of electricity and increasing navigational efficiency apart from controlling floods and eliminating chances of drought. The chapter critiques this striving effort of the government on economical feasibility, social acceptability and ecological sustainability which will 'neither secure domestic water supply in all the dry areas nor assure basic food security of India' (pp 177). According to the author, there is no justification of a river basin being surplus or deficit in hydrological science as each river basin represents an ecosystem and water flow in each ecosystem is according to the natural conditions in which it occurs. This chapter puts forward a very important learning of comprehensive assessment and appraisal is needed before planning interventions especially when it is going to impact a large population of people – positively or negatively. Interdisciplinary knowledge plays an important role in this judgment.

Overall, the book is very well researched and written in a lucid language which is both academically sound and scientifically justifiable. It carries a political perspective which shows an alternative to each issue discussed, barring the chapter on water pricing. This small and handy

book will be used by researchers and academicians interested in inter- and transdisciplinary knowledge on water as it also sets an agenda for future research and action. However, the reviewer expects the author to also dwell on the other six issues discussed as research agenda in the introductory chapter which was not elaborated in the chapters later.