

BOOK REVIEWS

Smith, L.; Porter, K.; Hiscock, K., Porter, M.J. and Benson, D. (Editors). 2015. *Catchment and River Basin Management: Integrating Science and Governance*. Earthscan Studies in Water Resource Management. xviii+292 pages. Routledge, Taylor & Francis Group, London. ISBN: 978-1-84971-304-7 (Hardcover).

The management of water resources has gradually become the most important challenge for the humankind not only because it is essential for the existence of all the life or because of the increasing scarcity and competing multiple demands of a growing human population on the limited freshwater on this planet Earth but also because of its multidimensional nature that spans over social, economic, political, cultural, legal and governance issues. Climate change is now an additional overarching concern.

Discussions on water resources management have thrown up several terms such as Integrated Water Resources Management (IWRM), Integrated River Basin Management (IRBM), Integrated Catchment Management (ICM) and Integrated Land and Water Resources Management (ILWRM). The Integrated River Basin Management (IRBM) which has been defined variously, seeks to coordinate 'conservation, management and development of water, land and related resources across sectors within a given river basin' for maximizing the economic and social benefits derived from water in an equitable manner' and at the same time emphasising preservation and, where necessary, restoration of freshwater ecosystems' (see http://wwf.panda.org/our_work/water/rivers/irbm/).

The volume edited by Smith et al. discusses the Integrated Catchment Management approach in which a tributary subbasin or a basin is considered as the catchment (or watershed). Further, the editors use the term 'catchment management' to 'refer to the management of water and to the relevant management of land uses and built infrastructure at a catchment and sub-catchment scale'.

The volume presents seven case studies from Europe, North America and Australia focussing largely on headwaters, water quality and diffuse pollution, and the issues of governance. It is organised into three parts. The first part is an overview which introduces the volume and describes catchment management issues. Second part includes the detailed description of case studies and the third part is a general discussion.

The case study from Australia presents the work of Healthy Waterways - an independent NGO which created awareness, built partnerships among multiple actors across a range of stakeholders and engaged in actions at different scales and locations and demonstrated that the collaboration across whole water cycle was key to achieving clean water, and that socio-economic development facilitates collaboration to deliver agreed strategic plans.

The case study of the headwaters of Chesapeake Bay in the upper Susquehanna basin presents an example of public funded bottom up network with innovative local leadership, strong technical

capacity and trust of partner agencies for achieving success in restoration of the Bay.

The case study of the Hudson river watershed in New York State presents a case of collaborative and integrated governance and improvement programmes which helped restore the Hudson River estuary by managing tributary watersheds through inter-municipal arrangements, outreach and coordination, extensive community participation and education along with pollution cleanup and natural resource conservation etc for improvement of quality of life of local communities, and public use and enjoyment of the river.

The fact that a large metropolis like New York city receives its water supply direct from Catskill and Delaware watersheds without treatment is an excellent example of the ecosystem services of natural watershed ecosystems, and payment for those services.. The watershed programme, for protection of water supply for some ten million people through an agreement between Federal, State and local stakeholders, manages conflict between economic development and water quality through part voluntary and part regulatory measures. It is managed by local authorities and institutions, and funded by city which has saved billions of dollars on infrastructure and saves millions every day on water treatment.

The role of catchments in protecting groundwater is demonstrated with three examples from northern Europe. In Oldenburg (Germany) groundwater has been protected through regulation, farmer cooperation, organic farming and purchase of land for afforestation. In Drenthe province of the Netherlands, drinking water supplies have been protected through floodplain restoration for flood alleviation, wetland and biodiversity conservation, recreation and controlling nitrates, etc. Land use changes and removal of polluting activities, based on scientific assessment, along with spatial planning and participatory stakeholder engagement have improved groundwater quality in the city of Aalborg in Denmark.

WWF's RIPPLE project in Northern Ireland is an example of local community leadership with power for decision making over river management, and shared responsibility of the community and several partner organisations. Similarly, in the case of a small watershed of Lake Loweswater in NW England, university researchers integrated their research with stakeholder engagement and local partners for knowledge generation and sharing for community benefits.

The third part of the book discusses the context and drivers of management, their complexity and diversity, why and how of partnerships, collaboration and law, tools for assessment, planning and management, and implementation. Finally, the volume provides a synthesis in the form of guiding principles and commonalities of scope, scale, processes and governance arrangements. This volume with diverse examples of successful catchment management for the protection of water resources at their source will be most useful to all those engaged in water resources management at the river basin scale.

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