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ISSN
1076-7975

Electronic Green Journal

 Peer Reviewed

Title:

Managing Water Resources: Methods and Tools for a Systems Approach

Journal Issue:

[Electronic Green Journal, 1\(31\)](#)

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Publication Date:

2011

Publication Info:

Electronic Green Journal, UCLA Library, UC Los Angeles

Permalink:

<http://escholarship.org/uc/item/9w01c8kg>



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Review: Managing Water Resources: Methods and Tools for a Systems Approach

By Slobodan P. Simonovic

Reviewed by Elery Hamilton-Smith

Charles Sturt University, Australia

Simonovic, Slobodan P. *Managing Water Resources: Methods and Tools for a Systems Approach*. Paris: UNESCO Publishing, and London: Earthscan, 2009. 640pp. ISBN 9781844075339. US\$77.85, cloth.

Simonovic opens (p. 3) with a key paragraph:

Freshwater is scarce. It is a fundamental resource, part of all social and environmental processes. Freshwater sustains life. Yet, freshwater systems are imperiled, and this threatens both human well-being and the health of environmental systems.

This is a challenge to all people. Simonovic moves, very directly, into the most challenging and competent writing yet published on water management. After a brief review of the problem he moves to a list of key issues which must be addressed. These are population increase, six socio-economic sectors that are totally dependent upon water, growing demand, ecosystem needs, interdisciplinary co-operation, essential institutional change and the evolution of technological strategies.

The history of water engineering tells an alarming story of what we have had but then lost. Archimedes opened up the new science of hydrology, the Roman Empire developed a remarkable engineering capacity which stands as a model to this day and which laid the foundation for water management ever since. But along with the advances, competing actions were allowed to interfere with or destroy water resource systems.

From this introduction, the book leads us through the ways in which systems theory opens up the contemporary approaches, the problems of uncertainty and the ways in which fuzzy sets theory can help us to mediate the problems which arise from uncertainty. From this point onwards, we can examine the ways in which this new approach can lead us through sustainability, simulation and model-building, optimization and multiple-objective analysis.

This is then located within 1992 Dublin objectives and the extent to which our failures are based in human social behaviour and the inherent shortcomings of many political processes and systems. Herein lays the central problem – even though fuzzy sets theory opens up new ways to proceed, it will be some time before the uninformed political opportunism of the modernist world can be displaced. Governments can proclaim their support for a healthier environment. But at the same time they often approve new initiatives which may make for accumulation of power and money but do great damage to the environment.

In dealing with new, and at first sight, very complex ideas Simonovic writes with clarity and

uncompromising directness. I must admit to finding his use of mathematical modeling is difficult to grasp given my lack of experience in that arena. Probably most readers will find some aspects of the book very difficult to fully comprehend. I can only say that I learn more and more at each reading and feel that it is worth persisting with any hard work demanded in developing my personal understanding.

Any reader who genuinely wants a stronger grasp of environmental theory and practice will achieve a great deal by working through the interactive exercises spelled out at the end of each chapter. The book also includes a collection of relevant software on a CD-ROM and is further supported by an active web site. I most strongly commend it to academics, post-graduate scholars and senior water resource managers.

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Electronic Green Journal, Issue 31, Spring 2011, ISSN:1076-7975