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Total water management: Practices for a sustainable future.  
American Water Works Association, Denver.  
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## BOOK REVIEW

**Grigg, N.S. 2008. Total water management: Practices for a sustainable future.** Denver: American Water Works Association. ISBN 1583215506, 298 pages, US\$156, AWWA Member Price: US\$104.

(URL: [www.awwa.org/Bookstore/productDetail.cfm?ItemNumber=35803](http://www.awwa.org/Bookstore/productDetail.cfm?ItemNumber=35803))

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*Total Water Management* was written by Professor Neil S. Grigg who has served the Department of Civil Engineering at Colorado State University, USA for 35 years and has also been the Director of the Colorado Water Resources Research Institute. The author is a very well-known expert in water infrastructure and has published more than 200 works on the subject.

The book describes in a very interesting and practical way the concept of "Total Water Management" (TWM) developed in the 1990s after single-purpose water management proved too narrow. In 1994, the American Water Works Association (AWWA) prepared a white paper on TWM which it defined as an "exercise of stewardship of water resources for the greatest good of society and the environment". The basic idea of TWM is that the water supply industry should assume leadership in resource conservation and the application of water management to the entire hydrological cycle. The emphasis on stewardship means that all citizens should participate in the exercise. TWM is needed since the environment's bearing capacity may be close to its limits and we cannot afford to waste or misuse water. The author points out that TWM must be more than visionary; the challenge is to move from vision to action.

While TWM emphasises the principles and practices of water management, its key focuses are economic and political issues. It assumes that stewardship is a public responsibility requiring participation of government and stakeholder groups at all levels. The two strong philosophical ideas behind TWM are environmental ethics and corporate social responsibility. The difference between what people are required to do and what they ought to do is the difference between law and stewardship, or social responsibility. The author reminds us that the environment – one of the key requirements for sustainable development – should be seen as a customer, too.

TWM is related to Integrated Water Resources Management (IWRM), a concept that has lately been strongly emphasised especially in the EU. Grigg dates the beginning of IWRM back to 1917, when the Flood Control Act called for "a comprehensive study of the watershed". He defines IWRM as "a framework for planning, organizing, and operating water systems to unify and balance the relevant views and goals of stakeholders". To him *integrated* means blending together while *total* covers the concepts of *comprehensive* and *integrated*. Grigg considers good policy and government commitment the basic requirements of TWM.

One of the important but difficult principles of TWM is *shared governance* – sharing of authority for reaching decisions beneficial to all parties. Planning under TWM is dynamic, adaptable, participatory, and balanced, and at the end of the day, TWM is all about coordination and sharing. In practice, there is little difference between the aims of IWRM and TWM. Yet, TWM was originally a product of the water

supply sector and thus represents more water services and the water industry than water resources management. Large gaps seem to exist between national policies and their implementation. Devolving of authority to local leaders, combined with more emphasis on stewardship, is more consistent with TWM than centralised command and control. This reminds us of how water services are typically managed at a lower hierarchical level than water resources and their planning. One of the core issues of TWM is the valuing of water which is difficult since we lack a valid system for it. Much of the action in TWM occurs at the local watershed level. In that sense, the action is close to services while the management of water resources typically takes place at higher administrative and geographical levels.

The author of the book considers that so-called institutional factors – government, bureaucracy, regulations, politics, incentives, attitudes and values, unclear roles, legal challenges, and culture – might hinder positive action. That is analogical to the definition by Douglas C. North, Nobel Laureate of Economics in 1993, who used a soccer analogy where "organizations are players, and institutions are the formal and informal rules of the game". Water industries face several major challenges: maintenance of infrastructure, complying with regulations, running of the water business, obtaining and protecting sources of water supply, and building the workforce capacity.

Grigg points out that the water industry can remain reactive, or it can lead us towards sustainable development. Since utilities deliver effective water services, they can lead in promoting stewardship. This would help the water industry beat the "it's not my problem" syndrome and move beyond narrow interests. It could take the lead in TWM through its own actions and by helping others to discover their most appropriate roles. Opinion leaders and the media should report more on water and environmental issues. Obviously, it would require more proactive thinking and active public relations.

The book is written in very clear and lucid language. Compared to many other water-sector hand books, it has an exceptional number of illustrative graphs and tables. Almost every double page has an indented short definition of a key concept. The examples of the books and experiences come mainly from the USA. Yet, since it deals with general principles and practices, they are applicable more or less everywhere as long as services are managed at the lowest administrative level.

For readers outside the USA, it is interesting to note that the public sector – the federal, state and local levels of government and related authorities – together bear the basic responsibility for water management in the leading market economy. All in all, I can warmly recommend this great book to anyone interested in the principles and practices that lead us towards sustainable water management.