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# Managers—Our Scarcest Resource

## Editorial

We give most of our attention to the technical aspects of water resources management and very little consideration to the human aspects. A brief review of articles published over the last two decades in this and other Canadian water resources journals, such as the *Journal of Fisheries and Aquatic Sciences*, *Eau du Québec* and the *Water Pollution Research Journal*, reveals only a small proportion addressing the issues of managing the people who manage the resource. Is it enough to leave these issues to occasional articles in other journals focussing on management, policy analysis, organizational development, and public administration? Or are these issues of such critical and fundamental importance to improving water resources management that we should be giving them more attention?

The principles and practice of water resources management have undergone major changes in the last two decades. The principles have evolved from the relatively simple and narrow perspective of single purpose, single means and single objective, to the more comprehensive perspectives of multiple purposes, multiple means, and multiple objectives. As a result, planning methods and processes have been advanced for guiding more comprehensive approaches to the management of river basins and regional water resource systems. At the same time, methods and processes have been introduced for assessing the economic, ecological and social impacts of water developments. Over time, assessment processes have been elaborated to provide a basis for project management from initial conception to eventual decommissioning. Questions raised in these planning and impact assessment processes have created novel demands for knowledge, increasingly necessitating close integration of research with management activities.

Attempts to put the new principles into practice have been problematic, but the experience has led to their progressive refinement. Not only has the necessary knowledge of biophysical and socio-economic systems frequently not been available, but major new difficulties have arisen in finding procedures for integrating biophysical and socio-economic information in ways that would be useful for management decisions. In addition, new problems such as toxic materials,

acid rain and climatic change have been recognized and pose major challenges to water resources management. Compounding these difficulties have been economic recession and restraint measures that have increasingly limited the funding available for management and research. However, out of the varied experiences there has come a more refined understanding of both the principles and the strategies required to put them into practice more effectively.

Innovations in management have been accompanied by major increases in the number and diversity of people involved in managing water resources. This has resulted from the growing demands for use of water resources as well as the expertise and representation of interests required by the evolving principles of management. The variety of natural and social scientists continues to expand, making management an increasingly interdisciplinary activity. These people may be associated with diverse professions and be employed by government, universities or the private sector. To provide expertise and representation of interests, agency personnel might be drawn from as many as four levels of government and a wide array of departments and branches within them. This is usually complemented by the participation of diverse public and private interest groups. All of these individuals and groups are likely to be involved in management either through formal processes, such as are provided by referral processes and public hearings, or through the many informal opportunities created in day-to-day activities.

Managers capable of orchestrating the activities of these diverse people have become crucial to the success of water resources management. They are the individuals who head the permanent divisions, branches, sections, services and directorates of public and private organizations, as well as the individuals responsible for temporary task forces, committees, study groups, project teams, and ad hoc groups. The effectiveness of this latter class of managers has become a major determinant of the productivity of water resources management as approaches have come to involve a succession of temporary assignments to special-purpose groups.

To be effective, each of these managers needs an increasingly wide variety of both technical

and administrative skills. While some specific expertise relevant to the group's task is essential, it is of much greater importance that the manager have a basic understanding of the variety of fields relevant to its task. More and more often this implies that particular natural science specialists must be able to communicate with other natural scientists as well as various social scientists and vice versa. In addition, the manager needs an appreciation of the variety of activities involved in water resources management and how they interrelate. Today this implies understanding the role of not only the traditional activities of allocation, regulation, subvention, construction and operation but also planning, impact assessment and research.

To put these technical skills into practice, managers have to have strong administrative skills. The productivity of the water resources management system depends on their ability to lead, delegate, coordinate, facilitate, conciliate, arbitrate, adjudicate, mediate, and negotiate so as to get the most out of their group. These skills are critical if they are to be able to operate effectively with groups that bring together people with varied expertise and differing interests and values. They must be adept at resolving disputes between jurisdictions with conflicting mandates, across sectors of the economy with competing interests, and across public and private groups with differing philosophies.

To deal with the challenges in prospect, water resource managers will increasingly need to integrate these technical and administrative skills. Anticipation of the cumulative consequences of projects and the design of sustainable development strategies will challenge us to make better use of existing knowledge, to recognize the uncertainties we face, and to do more within the constraints upon us. Managers will need to be people who accelerate learning by innovation and taking risks, who can think and act both strategically and tactically, and who achieve results by stimulating the creativity and enthusiasm of those working with them. Success will depend more and more on the interaction skills of the managers.

We find ourselves acutely short of managers who possess both these technical and administrative skills, relative to the growing need for them. Much of the difficulty that has been encountered in refining and putting emerging management principles into practice stems from weaknesses in interaction skills. The problem is not the split in federal and provincial rights and responsibilities, nor the multiplicity of jurisdictions and interests, nor the complexity and uncertainty of the science. Rather these are the

realities and the problem is our poor skills in handling the interactions they necessitate.

From this perspective, skilled managers are our scarcest resource and we should be giving much higher priority to their development. We should be actively learning from those in water resources management who are highly skilled. We should be adapting lessons from the extensive management studies in other fields to the unique characteristics of water resources. We should be investigating whether there are differences in the interaction skills needed to be an effective water resources scientist as opposed to resource manager. We should be revising our post-secondary education programs to provide the basic interactions skills that will be essential to all those intending careers in the water resources field and to establish the foundation for more of them to grow into skilled managers. We should be introducing organizational programs in the public and private sectors to improve the skills of those already at work.

As a first step, the Canadian Water Resources Association could make a major contribution by drawing on the experience of its members to propose a strategy for the development of water resources managers. It would be most timely if this could be submitted to the current study of the Science Council of Canada *Water Policy: Towards the Year 2020*. Beyond this, the Canadian Water Resources Journal could play a key role in fostering discussion of these management issues and reporting the results of experience and research. This could be initiated by a special issue devoted to this topic and might lead to a regular section in the journal.

The unique challenges facing managers of water resources mean that we can ill afford to leave these issues to other journals. Not only can we anticipate great improvements in water resource management from the application of well established and proven general techniques of administration, but also we should expect that it will catalyze new techniques appropriate to the field's unique characteristics. In turn, we should expect these to generate new perspectives on the priorities for conducting research on institutional arrangements, analytical methods and water resource systems. These are powerful reasons for this journal to take the initiative in giving more attention to the human aspects of management.

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