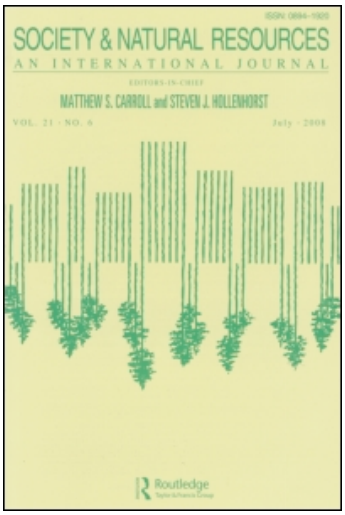

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A Social Innovation Framework for Water Demand Management Policy: Practitioners' Capabilities, Capacity, Collaboration, and Commitment

S. E. Wolfe [a]
[a] Department of Environment and Resource Studies, University of Waterloo, Waterloo, Ontario, Canada

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A Social Innovation Framework for Water Demand Management Policy: Practitioners' Capabilities, Capacity, Collaboration, and Commitment

S. E. WOLFE

Department of Environment and Resource Studies, University of Waterloo, Waterloo, Ontario, Canada

Water demand management (WDM) is reconceptualized within a social innovation framework. This social innovation framework encourages new opportunities and investigations about the social capital necessary for successful WDM. Influential elements include the knowledge held by WDM practitioners and the social networks in which they are embedded. These two elements have been neglected in conventional WDM policy and research. A reconceptualization of WDM requires changes in how we use decision makers' tacit knowledge and in how we support social networks for information exchange. It also suggests new ways to overcome implementation barriers in the area of resource management and to improve program sustainability.

Keywords municipal, norms, organizations, policy, practitioners, social innovation, tacit knowledge, water, water demand management

The first water demand management conference was held in Jordan in June 2004. The days were windy and dry and the resort—perched at the edge of the Dead Sea and surrounded by dusty, red hills—gave a respite from the heat. Yet it was soon clear how the oasis image was maintained: In addition to the two luxurious pools and a spa, every day, the resort's staff diligently spray-washed the walkways. The walkways were spotless and the wash water evaporated quickly under the scorching noon sun. But for a water demand management (WDM) and scarcity conference—with its underlying theme of how to alleviate poverty by ensuring water security—this was a disturbing, and seemingly overlooked, contradiction by the world's WDM experts.

Yet a WDM conference, after three decades of research, was an exciting indicator of progress. No longer the stodgy cousin of the capital-intensive, supply-management approach, the potential of WDM—to do more with less, to allow a reallocation

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Address correspondence to S. E. Wolfe, Department of Environment and Resource Studies, University of Waterloo, 200 University Avenue West, Waterloo, ON N2L 3G1, Canada. E-mail: sewolfe@fes.uwaterloo.ca

of supply when water is scarce, and to often cut operation costs of energy and chemicals—is slowly moving toward the agricultural and municipal mainstream. Much of the WDM research has focused on questions of technical infrastructure or public responses to regulations and pricing (de Young and Robinson 1984; Winpenny 1994; Renwick and Archibald 1998; Rogers et al. 2002).

Fewer studies have examined practitioners—the people responsible for implementing WDM within organizations—and their ability and willingness to adopt, implement, and, most critically, to sustain WDM (Sawyer 1983; de Young and Robinson 1984; Wescoat 1986, 1987). The neglect of the social variable—of practitioners' fallibility and influence on decision making and policy—could be one explanation for the limited, sustained success of WDM policies. To make WDM more successful—in more locations, over the long term, and under a greater variety of environmental and economic conditions—we must consider WDM practitioners' social capital—the unique combination of networked relationships, information, priorities and values that are transmitted through those relationships[1]—as contributing factors to the success of WDM strategies (Wolfe 2006).

To more fully investigate practitioners, their requirements, and their priorities, it is necessary to examine and reconceptualize water demand management. This article begins that process with an assessment of conventional WDM, an exploration of how social capital elements of knowledge and network theories can be used to reconceptualize WDM, and an explanation of how WDM might be understood within a social innovation framework. The insights provided here could then provide more appropriate support to practitioners and their WDM efforts and—if not challenge resistant attitudes toward WDM within practitioners' organizations—at least attempt to assist practitioners' in their efforts to sustain WDM policies.

An Assessment of Conventional Water Demand Management

Conventional demand management, as a water management policy, can be characterized by the strategies it develops, the organizational culture in which it is implemented, and the information that is used. These elements are discussed next.

WDM Strategies and Policies

A conventional water demand management (WDM) policy addresses temporal and distribution demand variability at the household and sectoral levels. It is conceived as a collection of technical, regulatory, and market strategies with some use of public education (Geller et al. 1983; Thompson and Stoutemeyer 1991; Baumann et al. 1984; Vickers 2001; Rogers et al. 2002; Brooks 2006). These tools are designed to generate more services per unit of water available, that is, to ensure efficient use in the agriculture, energy production, residential, or manufacturing sectors.

WDM Practitioners and Their Organizations

Water demand management policies are most often developed and implemented by government organizations. The policy success has varied greatly and implementation obstacles persist. The obstacles are often attributed to a lack of a crisis, for example, a chronic or acute water scarcity, that would generate enough public awareness and political will to shift agencies toward WDM and to sustain the policy momentum.

This is a forceful explanation but it has limits. To more fully understand why WDM policies succeed and fail, the influence of practitioners within the implementing organization must be considered.

Some research has examined practitioners' roles in resource management generally. For example, Sewell and Burton (1972) found that experts "have assumed not only the responsibility for solving problems and recommending means for attaining goals, but also for defining the goals themselves." Experts' values and attitudes, originating in professional training and reinforced within professional structures and cultures, are manifested in the strategies they identify and the knowledge they collect and endorse and may influence what "society wants and . . . how it will react to what is provided" (Sewell and Burton 1972).

But our knowledge of WDM practitioners is still limited: These individuals are likely to be trained as engineers or hydrologists and implementing WDM, at least initially, because of a crisis situation (e.g., drought). Within their organizations, particularly where the supply-management approach dominates, the use of WDM may be considered merely "desperation measures to try to avert or delay restrictions, increases in price, or the implementation of other administrative devices to curb demand in the short term" (Syme et al. 2000, 540).

Practitioners with this perspective—or "old thinking" according to Gleick (2000, 136)—will fundamentally influence WDM success and contribute to society's use of, and resistance to, conservation and efficiency measures. In a worst-case scenario, these individuals will struggle against a weak organizational capacity or be corrupted by strong, internal, political or private-sector interests. With these forces working against them, their efforts to effectively and equitably implement demand management policies will continue to be undermined (Bella 1987; Michael 1995).

In contrast, the efforts of committed WDM practitioners may be perceived as threats to their organizations' norms. This type of institutional resistance—whether it is explicitly stated or implicit assumptions—differs from conditions of insufficient political will, for example, where politicians do not want to be associated with increased water charges. Gunderson and Holling (2002, 328) found that

> [Human systems] have much greater powers for both rigidity and novelty. The ability of the bureaucracy of a government agency to control information and resist change seems to show a level of individual and group ingenuity and persistence that reflects conscious control by dedicated and intelligent individuals.

This pronounced resistance to change in human organization's culture and identity can have powerful implications for the actions of the individuals operating within its bounds (Gunderson and Holling 2002; see also Sewell and Burton 1972; Martin et al. 2001). When resistance is encountered, the conventional WDM strategy for addressing organizational inertia is to supply increasing amounts of data and information (Wolfe 2006)—more research studies, articles, databases, workshops, and conferences!

Water Demand Management Information and Knowledge

Conventional WDM research has focused on the tools required and the rationale for their use. This bounds WDM as a checklist or "toolbox of strategies" (McKenzie

et al. 2003) and narrowly defines types of data, information, and knowledge perceived to be relevant and ultimately applied.

A recent review of the theoretical and applied literatures found extensive explicit data, information, and knowledge[2] available to WDM practitioners. According to the knowledge management framework described by Mårtensson (2000), the working assumption underlying the WDM literatures is that the greater the supply of information, the more likely it is that learning, appropriate decisions, and policy adaptation will result (Wolfe 2006).

Working within this intellectual context, WDM practitioners have typically used two interdependent knowledge-management approaches. The first approach attempts to identify what data and information are required. This approach includes efforts such as WDM sectoral studies (e.g., municipal, industrial or agricultural use) and national assessments of water pricing (Policy Research Initiative 2004). The second approach aims to ensure that practitioners and decision makers have access to the explicit data and information. These approaches—to generate and distribute necessary WDM information—are essential contributions to practitioners' education and may help to dismantle implementation obstacles. But they focus on the symptoms, rather than addressing some of the causes, of WDM implementation obstacles.

Inherent Limits to the Application of Conventional WDM

Research has documented that merely providing data and information may not make projects or policies more successful (Davenport and Prusak 1998; Mårtensson 2000). The conventional approach of supplying greater quantities of information, though intended to facilitate learning and innovation, may have the opposite effect because:

> Learning, which mostly upsets beliefs and habits in individuals and in organizations, is hardly likely to be embraced easily or enthusiastically, even though there is a growing, and sometimes powerful, recognition of the need for change. (Michael 1995, 470)

An underlying problem is that explicit knowledge, upon which the conventional WDM conception relies, is insufficient to sustain WDM policies. Organizational inertia is extremely powerful and the provision of explicit data and information is inadequate, in many cases, to generate changes in individuals' professional training and decision-making behavior (Ajzen 1991). It may even reinforce existing norms that run counter to WDM interests. Recognizing this human element in WDM can help to explain why efforts to overcome WDM obstacles have met with limited sustained success.

Water Demand Management Within a Social Innovation Framework

The value of the WDM policies is increasingly recognized in the research and applied literatures (Gleick 2000; Vickers 2001; Policy Research Initiative 2004). Yet our understanding of what is required to improve WDM policy ongoing success has not progressed very far. For example, it may be that the obstacles to WDM arise, at least partially, from its conventional conceptualization. As outlined earlier, the

conventional conceptualization is limited in that its solutions do not consider the ways in which practitioners' experiences, values, beliefs, and attitudes influence a WDM policy.

By applying insights from social capital theory, WDM can be reconceptualized within a social innovation framework. This theoretical framework draws on knowledge management, organizational theory, innovation diffusion, and network theory to reconceptualize WDM. The new focus embeds WDM practitioners—with all of their quirks and inconsistencies—in the policy process and adds "how we view it" to the conventional questions of "how and when we do it".

This reconceptulization extends the range of possible WDM questions about different types of knowledge and the impact of organizational culture. Finally, a reconceptualized WDM also allows for greater, and more nuanced, investigation of the influence of WDM practitioners' social capital: their capabilities (i.e., skills and knowledge), their capacity (i.e., ability to act), their collaboration (i.e., social networks), and their commitment to WDM (i.e., willingness to act; Wolfe 2006).

Water demand management can be better understood when it is recognized as a strategy for social innovation. A social innovation is any development of a new way of thinking, skills, or interventions that address complex social problems (Westley et al. 2006). In this case, the social innovation aspires to sustainable water use (as part of a larger sustainable development worldview) and, as an inherently complex problem, it necessitates deliberately prudent and responsible decisions at global and personal levels. Sustainable water use qualifies as a social innovation because it:

- Challenges the norms in a society that currently values consumption over conservation (Norgaard 1994).
- Necessitates major changes in society's attitudes, values, and behaviors related to water (Nancarrow et al. 1996–1997).
- Shifts attention away from technical and economic solutions and toward explicit personal and political choices (de Oliver 1999).

The WDM research conducted by Wolfe (2006) was conceptualized within a larger social innovation framework. This reconceptualization shifted the focus away from the tools aimed at water consumers and focused instead on WDM practitioners and their opportunities to move a social innovation forward. Specifically, Wolfe's (2006) research assessed the influence of practitioners' social context on their WDM decisions; their tacit knowledge; and the professional networks that structured their organizational culture.

These questions—about practitioners' social capital and knowledge within their organizational cultures—become possible when WDM is embedded within a social innovation framework. For example, the range of possible questions includes: What types of knowledge do practitioners need and use in the practice of WDM? Where do they get their information? To whom do they talk with about WDM, and why? Do they have professional relationships that provide information and knowledge resources for their efforts? What makes these people willing to push the WDM agenda in societies that have been long dominated by the supply-management approach and where social norms are deeply entrenched in the consumer mentality? Why do they bother to practice WDM when the odds of success are so frequently stacked against them? In essence, what makes these people willing to adopt, apply, and sustain a WDM strategy? And what makes them willing to convince others in their social network—composed of colleagues, friends, and challengers—to do so?

As these questions are investigated, a complicated story unfolds about what happens when a WDM strategy is first implemented, how it is maintained, and why it may be dismantled.

Investigating WDM Information and Knowledge

Practitioners hold, and draw upon, different types of knowledge; this variability influences their WDM decisions. Tacit knowledge consists of deep beliefs and values about the way the world works and about what aspects of the world are important (Polanyi 1966; Ambrosini and Bowman 2001; Gertler 2003). Usually grounded in practical experience, tacit knowledge is informal (i.e., not written down), unspoken, and sometimes almost impossible to consciously articulate. People are often not even aware of their tacit knowledge; rather, their deepest beliefs and values operate as a kind of implicit and unquestioned background understanding that shapes the way they see the world and act within it. Tacit knowledge shapes the reasons for concern about water efficiency, the ways in which that concern is acted upon, the ways in which that concern prompts adaptations in day-to-day practice, and the things said about this concern in discussions with colleagues. Their tacit knowledge (Polanyi 1966; Gertler 2003), for example, is not recognized or easily articulated. The effects of tacit knowledge are so subtle that WDM practitioners are often not be conscious of them. But tacit knowledge shapes practitioners' decisions, actions, values, and expectations, and it is important to identify its expression and effects.

Articulating practitioners' tacit WDM knowledge clarifies the environment in which practitioners define, use, and transmit their data, information, and knowledge. Indicators derived from Gertler's (2003) concept of "institutional proximity" have been used to identify and describe the tacit WDM knowledge found among WDM advocates and practitioners (Wolfe 2006). Gertler (2003, 90–93) defines "institutional proximity" as the milieu in which water decision-makers operate; it consists of their "shared norms, conventions, values, expectations, and routines arising from commonly *experienced frameworks of institutions*" (italics in original), as well as their "choices, practices, attitudes, values." Underlying the decisions made by an individual is the tacit knowledge about what constitutes a problem, and perspectives on the nature and value of water (Nancarrow et al. 1996, 1997; Freeman 2000; Hamlin 2000; Adler and Kwon 2002). Stewart (1986, p. 223) observed that

> The ways in which people and institutions regard water resources— . . . the values assigned to water, the uses of water, their recognition of and attitudes toward solutions offered— . . . will be the final factors determining the manner in which water resources are conserved and developed.

These elements are shaped by the acquisition and use of knowledge, as well as interactions and norms within the individual's social networks.

An understanding of the values, attitudes, and beliefs of WDM practitioners (the people who design and implement policies) may help to explain implementation gaps and to make water resource policies more effective. Research has shown that tacit knowledge is critical because it facilitates the collaboration and information transfer that are necessary to overcome resistance to new ideas or policies (Gertler 2003). Without tacit knowledge, the cross-sectoral or interdisciplinary collaboration required to generate explicit knowledge is less likely to occur. Using tacit knowledge

will also help WDM policies succeed. Rather than merely disseminating explicit data and information, particularly in environments that are not experiencing a scarcity crisis, WDM advocates could exploit and support the tacit knowledge that already exists—the community's social capital (Adler and Kwon 2002) among WDM practitioners.

WDM and Organizational Culture

Social networks are a fundamental part of an organization's culture. They help to reinforce tacit knowledge through ongoing, personal interactions and relationships and facilitate the exchange of explicit knowledge (Polanyi 1966; Gertler 2003).

The network component of the social innovation framework has a methodological precedent in the research on global network for professionals working on endangered species (Westley 1997). Westley's (1997) findings implied that professionals exhibited substantial commitment to the Sisyphean task of stopping or slowing the extinction of species. Her findings suggested that network structures and relationships, among other factors, were critical in sustaining professional and personal commitment to the solution of an environmental crisis. Westley's (1997) research sets two precedents for the framework described here: first, in its use of qualitative methodology focused on resource managers' communities; and second, in its perspective on the significance of collaboration and commitment in cases where resource management problems are intractable and dire or where innovative policies encounter entrenched obstacles.

Several characteristics of WDM social networks have been identified, for example, in their structure and function (Wolfe 2006), and these have significant implications for the exchange of knowledge. But for the purposes of this article, it is worth noting that these networks are populated by practitioners who show some, or all, of the following characteristics:

- Self-identified as "environmentalists" (or people with an acknowledged love of the natural environment).
- Interdependent, who gain satisfaction from working with others in the social network.
- Passionate about WDM tasks.
- Influenced by inspirational leadership or mentorship.
- Exhibit a sense of responsibility and obligation.

Wolfe's (2006) research suggested that providing support to these social networks could help overcome the obstacles to the success of WDM.

Conclusions

The research and practice related to WDM strategies has been mainly limited to investigations of efficiency tools, regulations, and public responses. Such a restricted approach provides only a partial understanding of the factors that contribute to the development of a social innovation.

A reconceptualization is both an alternative to, and an extension of, the conventional understanding of WDM. It represents an alternative because it challenges the dominance of the technical conceptualization and it extends our understanding

by exposing it to new literatures and insights. This process reveals new areas of investigation. The framework outlined in this article emerged from the recognition that the conventional understanding of WDM limited the opportunities to investigate issues associated with WDM practitioners. The framework provides the intellectual space to investigate networks and knowledge that would not have been investigated in the context of conventional WDM research

The social innovation framework can be used to more fully explain why many WDM policies fail, even when practitioners have extensive WDM knowledge and are working in physical environments where WDM would be beneficial. This framework can contribute to the success of WDM policies by:

- Extending the range and types of questions available by researchers examining WDM strategies.
- Restructuring our understanding of the relationship between decision makers and the success of WDM policies.
- Highlighting the importance of individual capabilities.
- Expanding the range of policy options and management opportunities.
- Supporting and sustaining the implementation of WDM strategies.
- Making responses to policy obstacles more effective.

Reconceptualizing WDM represents a fundamental shift that can only take place in the context of a broad movement involving political advocates, researchers, practitioners, and the range of tools upon which they draw. Such a movement would change the ways in which WDM is presented and used within households, organizations, and our society.

Notes

1. See Adler and Kwon (2002) and Rydin and Holman (2004) for reviews of the extensive social capital literature.
2. Explicit knowledge dominates in a mechanistic society devoted to dividing problems into their component parts (Norgaard 1994). It is based on evidence, readily conveyed to those who have similar frames of reference (such as language, education or experience), and communicated with a global, written language, such as that found in engineering or mathematics.

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