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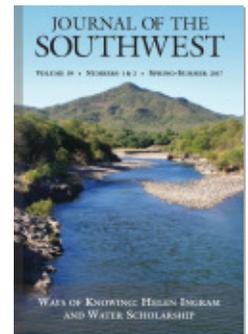
Contributions of Helen Ingram to Critical Concepts around  
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Peter H. Gleick

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## *Contributions of Helen Ingram to Critical Concepts around U.S. Water Governance*

PETER H. GLEICK

Helen Ingram's contributions both to the integrated fields of water resources and to the careers of individual scientists working in these fields are hard to overstate. I am a scientist by training, with backgrounds in engineering, hydrology, and climatology. As my education and career advanced, I received real world lessons, over and over, that reinforced the idea that while freshwater challenges have deep scientific roots, they will never be solved solely with scientific and technological answers. And every time I received these lessons, worked to expand my knowledge and background on the social, political, and cultural factors at the core of the freshwater challenge, and sought out experts in these fields, I ran into Helen Ingram, who was there first. Helen's contributions to the field, at its heart, were to bring a moral and ethical voice into the discussions around water while incorporating first-class scholarship around the concepts of social justice, equity, and culture. As such, she has long been an inspiration to me.

My own graduate training in the late 1970s and early 1980s came from the Energy and Resources Group at the University of California, Berkeley, which was uniquely designed to explicitly acknowledge and integrate multidisciplinary education in the context of global resource sustainability issues. This was a fertile time for scholars seeking new insights into environmental and resource challenges. The nation had recently experienced the energy crises of the 1970s, new discussions on limits to growth, public awareness of environmental problems and growing political support for solutions, and a rethinking of educational strategies and priorities away from narrow disciplinary approaches toward more integrated thinking.

The prevailing paradigm in water governance was one of a "hard path" approach. The "hard path/soft path" distinction was first clearly enunciated by Lovins in the context of energy resources (Lovins 1977).

PETER H. GLEICK *is co-founder and president emeritus of the Pacific Institute.*

Broadly, this concept sought to expand energy policy from large-scale, centralized infrastructure and management systems to smaller-scale, renewable, integrated thinking around technology, economics, and management. Parallel research in the water area has suggested that similar fundamental changes make sense for freshwater as well, and the “soft path for water” was developed (Gleick 2002, 2003; Brooks et al. 2009).

A particularly challenging aspect of this new integrated thinking, however, is around the social science components of water. This is partly the result of the long dominance of male, engineering-trained experts, who were hugely successful in putting in place much of our modern water collection, treatment, and delivery infrastructure. Hard, physical infrastructure in the form of dams, reservoirs, aqueducts, and centralized treatment and distribution systems brought enormous benefits to modern societies, delivering high-quality, low-cost water to most people in developed countries, taking away wastewater, and reducing social vulnerability to extreme events such as floods and droughts. It also permitted massive expansion of irrigated agriculture in the arid and semi-arid western United States and the unconstrained growth of western urban population centers. Accompanying this physical infrastructure were centralized management systems in the form of large water utilities and state agencies founded around political boundaries rather than hydrologic ones.

As populations continued to grow, however, the limitations and flaws of the 20th century “hard path” approach began to manifest themselves. Disputes over water policies and strategies began to surface in the United States in the 1960s and early 1970s as dying lakes, drying rivers, contaminated watersheds, and declining fisheries became visible and politically salient. Inequitable access to water, together with disparities in economic costs and political power, spurred the formation of community groups seeking new policies and a bigger voice in key water decisions.

Ingram saw these problems early, wrote about them, and even more importantly, pushed hard to open the door to closed academic and policy forums where social science was traditionally discounted, ignored, or misunderstood.

Ingram’s experience with water resources is long and deep. While Ingram occasionally published on other natural resource issues (including air quality, climate change, and ocean management), her focus has always been freshwater resources, and especially the freshwater resources of the American Southwest. She had an early introduction to the political process around water policy development: Ingram was one of the few

staff with political science training (and one of only a couple of women) working for the National Water Commission between 1969 and 1972 (National Water Commission 1973). And in her classic fashion, after the publication of the commission's final report, Ingram wrote a detailed critique of the report and the process (Ingram et al. 1975), highlighting its limitation for changing water policy and especially the lack of a theory of change—an observation that has proven to be consistently true in water policy forums at all levels.

It is very unlikely that the report itself will or could ever be used as a platform for reorganization of water policy. It is too discursive over too many separate unrelated topics...the report essentially has no comprehensive framework to indicate what is important and what relates to what. The usefulness of the commission report as a blueprint for change is also severely limited by *the lack of any theory that explains how we got where we are in water policy and how to go about changing. The commission needed to identify the incentives and disincentives that operate upon current participants in making water policy and the means by which and extent to which they might be changed.* (emphasis added)

Ingram's concept of a "theory of change" in water resources policy developed early. In 1971, she wrote an article in the *Natural Resources Journal*, "Patterns of Politics in Water Resources Development," that called for a model and approach that could acknowledge and account for the role of political actors around freshwater issues (Ingram 1971). This was followed by a more detailed assessment of specific decision "rules" that she felt dominated water politics: local support, agreement, mutual accommodation, mutual noninterference, fairness, and equity (Ingram 1972). These rules and principles have continued to form the basis for much of her writings.

My personal interactions with her began in the mid-1980s in the context of a major national effort to explore the risks of climate change for U.S. water resources. This effort was put together by the American Association for the Advancement of Science (AAAS) starting in 1986 under the management of Roger Revelle and Paul Waggoner. As a newly minted PhD with a focus on water resources and climate change, I was invited to participate in a committee dominated by male scientists, engineers, and water managers, with a smattering of resource economists and one serious social/political scientist: Helen Ingram.

The AAAS project was the first comprehensive attempt to look at the issues facing water resources of the United States in the context of a changing climate, from sciences to management and from the global level to the local. The committee met several times over the next couple of years, developed an outline for a comprehensive set of research papers, and conducted a series of interviews with water managers in key regions around the country.

Ingram's unstinting efforts on this committee to expand the scope of the project (and the minds of the other committee members) to encompass the political and social aspects of the work were emblematic of her efforts to do this more broadly in national discussions, in academic meetings, and in practical efforts to bring water managers into the 21st century.

That project culminated in a book (Waggoner et al. 1990) and presentations to the scientific community and to water managers around the United States. In a perhaps symbolic example of the way science-oriented academic experts think—including relatively thoughtful and progressive ones—the chapter by Helen Ingram and her co-authors was the last one in the book, almost an add-on or afterthought. Yet, in my opinion, it is the most prescient and relevant to the still-controversial topic of climate and water.

In the opening section of that chapter (Ingram et al. 1990, p. 421), Ingram et al. wrote:

We examine how the characteristics and biases of the political system operate to preselect from among all possible problems and solutions those that become political and thus receive serious consideration by policy makers.

The political agenda around water is made up of problems and solutions deemed both amenable to public action and worthy of the concerted attention of policy makers. Although nowhere compiled in concrete form, the political agenda is nonetheless a fairly stable list of topics to which additions and deletions are made rather infrequently and only through complex screening. Selection is strongly biased by the needs and views of the institutions that comprise the attentive publics, that is, those who have a stake *backed up by appropriate resources to pursue their interests*. Such participants may include agencies, interest groups, the media, policy analysts, elected officials, and the scientific community itself....

*What gets on the agenda is not an abstract of impartial determination, especially where science cannot yield precise answers to questions, but can only establish ranges of seriousness, certainty, and timing. Thus whether climate change reaches and stays on the political agenda is a political matter. (emphasis added)*

These highlighted insights remain true today: Despite remarkable advances in climate science, which only make tackling climate threats more urgent than ever, whether climate change reaches and stays on the political agenda is still ultimately a political matter and a matter of economic and social power, as witnessed by the continued ideological opposition at the national level to any legislative action.

Ingram has also long been a passionate defender of inclusivity in public debate and decision making, with a specific focus on the need of the academic community to move beyond technocratic language and learn to speak to a broader audience in broader terms.

For an issue to expand its appeal beyond the realm of experts, it must be embraced by institutions whose purpose is making things popular: the media, interest groups, and elected officials. We must therefore understand how these entities will likely treat climate change. (Ingram et al. 1990, p. 431)

This recommendation is also one I've taken to heart, in my efforts to speak with a far wider audience than just academics. Yet it remains a controversial one, as scientists are rarely rewarded for talking to the media, policy makers, or the public.

One final observation of a professional and personal nature: The role of individuals in leadership positions is often crucial for driving system changes and transitions. Like any factor, the effect of such individuals can be difficult to disentangle from other variables, but some researchers, including Ingram, have noted important influences in key water resources controversies and challenges, such as the restoration of the Florida Everglades and the fight to protect the Grand Canyon from new dams (Ingram and Lejano 2009). Helen Ingram herself is one of these individuals, responsible for driving fundamental changes in the way we think about water, generously nurturing young women and men trying to get into the field, and consistently producing insightful and influential work. As the world continues to move toward a more sustainable water future, Ingram's influence will be persistent and foundational. ❖

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