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Water Policy and Cultural Exchange: Transferring Lessons from Around the World to the Western United States

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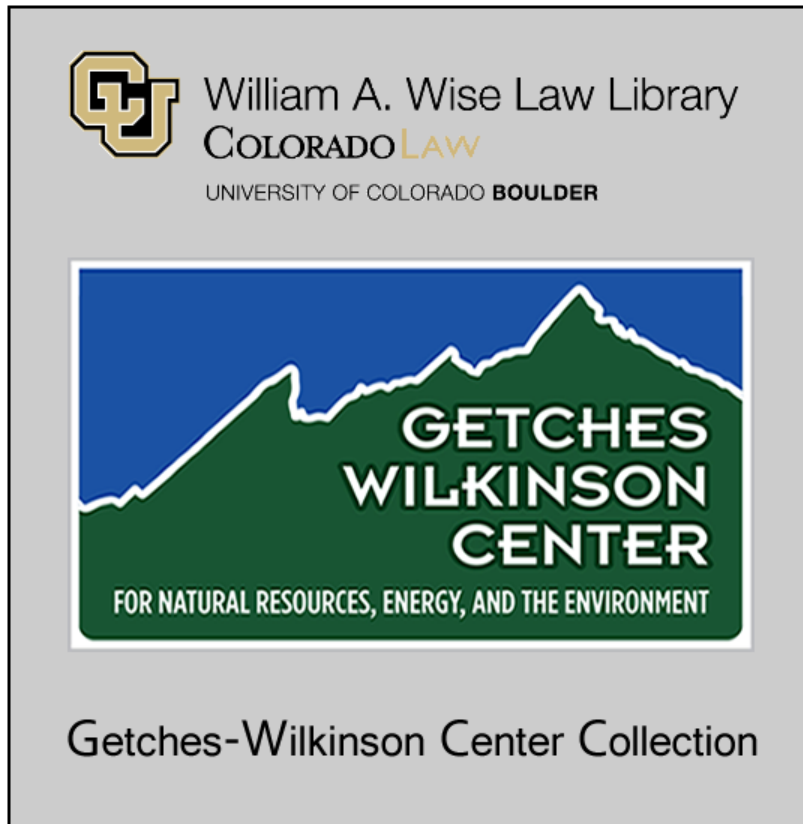


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Citation Information

Wescoat, James L., "Water Policy and Cultural Exchange: Transferring Lessons from Around the World to the Western United States" (2002). *Allocating and Managing Water for a Sustainable Future: Lessons from Around the World (Summer Conference, June 11-14)*. <https://scholar.law.colorado.edu/allocating-and-managing-water-for-sustainable-future/58>

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James L. Wescoat, *Water Policy and Cultural Exchange: Transferring Lessons from Around the World to the Western United States*, in *ALLOCATING AND MANAGING WATER FOR A SUSTAINABLE FUTURE: LESSONS FROM AROUND THE WORLD* (Natural Res. Law Ctr., Univ. of Colo. Sch. of Law 2002).

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**Water Policy and Cultural Exchange:
Transferring Lessons from Around the World to the Western United States**

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Notes for a presentation
at the conference on

“Allocating and Managing Water for a Sustainable Future:
Lessons from Around the World”

Natural Resources Law Center
University of Colorado School of Law

June 11 – 14, 2002

Editor's Note: The following document is a draft. Upon completion of the conference, this material will be revised and integrated with material from other presenters. Ultimately, it will comprise a chapter in a book based on the conference. Given that this is a working document, the author should not be directly quoted without permission, and the draft nature of the document should be noted in any use of, and references to, this work.

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My interest in international water policy and cultural exchange stems from work as a landscape architect on design projects in Glenwood Canyon, Colorado, and Kuwait, implicitly using knowledge gained in one place when addressing problems in another. Subsequently as a graduate student at the University of Chicago, I took courses on ancient irrigation systems in Mesopotamia, Egypt, and Mesoamerica, but they offered none on the western U.S., which was alternately regarded as *exotic* and *mundane*. From these early experiences to the present, geographic comparison of water policies has seemed useful as well as intellectually stimulating, and I am delighted to have this opportunity to develop that theme.

1. Problem Statement

The water management field has expanded geographically over the past century, especially in recent years with the expansion of Internet resources, international projects, travel, trade, and water resources education. The central question of this paper is, “how can water management lessons be drawn for the Western U.S. from distant places?” My thesis is that while important lessons can be transferred to the West, they entail difficult theoretical, methodological, and cultural challenges. Indeed, there are at least six arguments *against* water management transfers:

- 1) *Irrelevance* – the most extreme argument asserts that each watercourse, water user, or water organization differs from all others, and thus only local solutions have long-term salience and sustainability.¹
- 2) *Incompatibility* – this argument asserts that while water users address comparable problems on comparable watercourses, their solutions cannot be transferred because solutions developed in one context are incompatible or unsustainable in other contexts.
- 3) *Incomprehensibility* – this argument suggests that even when potentially compatible solutions are developed in different areas, people rarely know *how* to transfer them from one place to another.
- 4) *Proximity* – this less extreme view suggests that even if distant solutions are relevant, compatible, and comprehensible, solutions closer in space and time are likely have more relevance, etc., and are also likely to be sufficient to address local problems. As a region develops its own capabilities and assets, it views the search for distant solutions as decreasingly worthwhile. Conversely, as experiments in distant places diffuse, they can and will be absorbed without special effort.

¹ While White (1957) emphasized that every river is different, he also drew valuable generalizations about international river basin development.

- 5) *Coercion* – this argument takes a radically different tack, arguing that some historical “transfers” have been imposed by one place on another in ways that are harmful, e.g., when water treaties are negotiated in the wake of conquest, water policies are extended uncritically across ecosystem boundaries, or when risky water management experiments are launched in colonized territories. As one Uzbek water manager put it when refusing foreign water management assistance shortly after independence, “We have our own mustaches!” Anti-globalization movements against privatization of water supplies are another example of resistance to what are regarded as coercive processes.
- 6) *Difference* – all of these arguments share a view that many of the lessons of water policy transfers have been negative. While negative lessons can be as valuable as positive ones, they must not be replicated. Conversely, the politics of difference should be jointly concerned with equitable processes of transfer, economic well-being, and sustainable water resources outcomes (Young, 1990).

Each of these arguments *against* drawing lessons from one place to another invites elaboration and rebuttal, which could comprise an entire paper. For present purposes, however, they serve as guideposts or pitfalls to be avoided when developing arguments about how lessons *can* be transferred in sustainable and equitable ways. My approach is to:

1. Start with four trends in 20th century water policy that have worked for or against the transfer of lessons to the Western U.S.
2. Within this historical context, to survey four conceptual approaches that can help facilitate transfer of promising lessons to the West:
 - a. Comparison and Differentiation
 - b. Diffusion of Innovations
 - c. Social Learning and Social Movements
 - d. Legal Transplants
3. Conclude with an integrative perspective on how these trends and approaches can be put to work in other substantive sessions of the conference.

2. Water and International Cultural Exchange in The 20th Century: Four Trends

The 20th century was an extraordinary period of water resources development, degradation, protection, and management -- at all scales and in all subsectors. Of the many changes that occurred, this paper highlights four trends that involve the western U.S.:

- Rapid Changes in Water Resources Knowledge and Environmental Management.
- Declining Attention in Western Water Policy to International Experience.
- Increasing Involvement of Western Water Experts in International Projects.
- Decreasing Clarity about the Next Phase of Cultural Exchange.

These four trends are briefly outlined and illustrated in the sections that follow.

A. Rapid Changes in Water Resources Knowledge and Environmental Management.

Between 1900 and 2000, the fields of engineering hydrology, hydraulics, aquatic ecology, limnology, hydrography, water law, and other fields of western water policy have made extraordinary advances (Wescoat, 2000). The growth of Internet water resources information alone -- ranging from documents to data, models, and decision support systems -- defy comprehensive description (see White, Wescoat, and Ferrara, 2002, app. A, for an attempt). At the same time, information on water management problems and approaches in other parts of the world have become increasingly, though not uniformly, accessible (Wescoat and Halvorson, 2000). For many if not most water managers in the western U.S., international studies of water management and environmental policy are increasingly available. In light of this rapid expansion of and access to scientific and policy information, how can it make sense to neglect international water management experience?

B. Declining Attention in the Western U.S. to International Experience

Surprisingly, western water policy does appear to neglect international experience. The record of western interest in foreign water management is complex, and can be only briefly outlined here. The story begins in the mid-19th century with a remarkably cosmopolitan attitude among early western water managers. For example:

1. During the 1860s to 1910s, there are many examples of active searching for international lessons, including:

- (1) Consular letters to diplomats in Asia, Europe, and the Middle East in the 1860s (Wescoat, 2001); cf. also George Perkins Marsh (1864, 1874), a former diplomat, on environmental lessons from Europe and the Mediterranean.
 - (2) Engineering delegations to Australia, China, Egypt, Europe, and India in the late 19th century (e.g., Brown, 1904; Davidson, 1875; Hall, 1886; Wilson, 1890-91, 1894).
 - (3) Foreign publications in the newly created libraries of land-grant university extension programs, e.g., as evidenced in the Colorado State University extension agent reports of the early 1880s.
 - (4) Migration of foreign water specialists from Asia and Europe to the western U.S., ranging from civil engineers to stonemasons and irrigators.
 - (5) Surveys of foreign water laws in treatises and casebooks on water and irrigation law (Kinney, 1912; Ware, 1905; Weil 1911).
 - (6) Redevelopment of Native American canals and water works (e.g., in the Phoenix, Arizona, area).
2. During the 1910s to 1940s, these international processes slowed down, partly due to financial crises, wars, and increasing regional capabilities of western water organizations.
 3. But a major shift occurred in the post-war years, from the 1950s to 1980s when western water documents cease to refer to international experience, beginning instead with the constitutional foundations of water management (i.e., federal and state responsibilities and relations) (e.g., President's Water Resources Policy Commission, 1950). Ironically, this inward-looking perspective in western water policy coincided with increasing U.S. involvement in water development in other regions.
 4. The extent of this continuing eclipse of international consciousness in western water policy is evident in recent reports (NRC, 1999; WWPRAC, 1998; cf. the international perspective of the World Commission on Dams, 2001).²

Parochialism in western water law and policy increased during the late 20th century.

² There are important academic exceptions in western water research, e.g., Ingram et al., 1995; Gleick and Morrison, Moench, 1991, 1999; NRC, 2002; and Worster, 1985 to name a few.

There have been important exceptions in *historical* research on the role of Native American, Chinese, Hispanic, Italian, Japanese, Punjabi, and Scottish irrigators in the west, but the relevance of these academic works for contemporary water policy is unclear. Western water policy documents seem decreasingly informed about comparable efforts in Africa, Asia, Europe, South America – as well as their actual and potential relevance for the U.S. This trend has occurred as those regions have developed new approaches, experiments, capabilities, and knowledge, in part through increased involvement of western water experts.³

C. Increasing Involvement of Western Water Experts in International Projects

During the 19th century, U.S. water experts were welcome visitors to water projects in Asia and elsewhere, but they had little detailed experience with those systems. Colonial exclusion of foreign researchers persisted, with some exceptions, through the mid-20th century. Among the more important exceptions were U.S. and European flood disaster assistance to China during the 1920s, in part under the auspices of the League of Nations (Wescoat, 1995b). U.S. missionaries also had continuing involvement with small water and public health programs in European colonies. On a larger scale, the Tennessee Valley Authority began to receive international recognition in the 1940s, prior to decolonization (e.g., in the Damodar Valley Authority in India and Gal Oya Authority in Ceylon). Similarly, federal water agencies, such as the U.S. Geological Survey, Soil Conservation Service, U.S. Army Corps of Engineers, and U.S. Bureau of Reclamation had some involvement in other nations in the early 20th century, which escalated rapidly after World War II.

Beginning with the first U.N. conference on Natural Resources (1948) at Lake Success, New York, U.S. approaches to integrated river basin development were increasingly emulated abroad, with U.S. assistance, though *not* at home. President Truman's Point Four program established foreign aid for developing countries that, along with pervasive U.S. influence in the United Nations and World Bank, escalated the export of U.S. water expertise and policy approaches.

One of these export processes included visits and training of foreign water specialists *in* the U.S., notably at the Bureau of Reclamation headquarters in Denver and at western land-grant universities, notably in Arizona, California, Colorado, Texas, Utah and elsewhere, which received millions of dollars for applied research, education, and training contracts, e.g., in the field of irrigation systems management (Ives and Bochar, 2002; Freeman, et al., 1989; Wescoat, Smith, and Schaad, 1992).⁴ It is not clear what

³ Interestingly, other branches of American law cite increasing foreign influence (Clark, 1994).

⁴ Harvard and Cornell were also extensively involved, e.g., in Pakistan and Sri Lanka, and their programs may have had less direct influences on western water policy (e.g., through analytic methods at Harvard and irrigation systems and bureaucratic research at Cornell)(e.g., Uphoff, 1992). For example, the Ford

influence foreign visitors may have had on water managers in the western U.S. or what foreign lessons western water specialists brought back to the U.S.⁵ Nor is it clear what western water managers might draw from emerging international and global water forums. Some U.S. scholars are involved in the GWP, IWRA, WWC, and so on, but U.S. agencies and managers less so. If continued, this would mark a departure from increasing U.S. participation in international water management in the 20th century, which would limit the prospects for learning from experience in other parts of the world.

D. Decreasing Clarity about the Nature, Role, and Future of Water Policy Exchange

Having shifted from a region that imported water management lessons in the early 20th century to one that exported lessons in the late 20th century, the western U.S. now finds itself in a new situation, in which an abundance of new knowledge about water management is emerging from different parts of the world but the interest and capacity to use that knowledge in the western U.S. remains unclear. In light of this changing situation, it comes as little surprise that there is skepticism about the relevance, compatibility, comprehensibility, and transferability of international water experience for addressing contemporary water problems in the western U.S.

While preparing for this conference, we had widespread enthusiasm but also wide-ranging views about what *could* be learned from distant places and times.⁶ A first step was to increase our awareness, for example, of social scientific research on irrigation management in Sri Lanka and elsewhere (IWMI); participatory watershed management in India (Farrington, Turton and James, 1999); comparative water law in academic institutions (Seidman and Seidman, 1996; Tarlock, 1997; Wouters, 1997) and UN agencies (Teclaff, 1972), such as the FAO legislative series pioneered by Caponera (1973) and continued by Burchi (1991, 1994); and newly developed resources such as Oregon State University's Transboundary Freshwater Disputes Database (Wolf, 2002).

A second problem was to grapple with the comparability of experiments in different environments, spatial scales, and cultural and legal contexts. Our initial inclination was to think, as Montesquieu did in the 18th century, that arid and semi-arid regions would provide the closest analogues to the American West (e.g., Grossfeld, 1983; Maass, 1990; Maass and Anderson, 1978; Montesquieu, 1949 reprint; Semple, 1918; Wilhite et al, 1985). But that sort of reasoning can lead to the pitfall of environmental determinism of the sort exemplified in Karl Wittfogel's *Oriental Despotism* (1983/1957)(cf. Wescoat, 2001). Wittfogel erred in many of his comparisons, but he

Foundation's Rural Poverty program was for many years headed by a scholar who conducted research on irrigation organizations in Asia and later supported research on water and poverty in the southwestern U.S.

⁵ There is a need for extensive empirical research on these topics while international program leaders from the 1970s, their papers, and USAID archives are available.

⁶ Lowenthal (1985) argues that early historical periods are analogous to distant places.

correctly recognized both their importance and some of the problems associated with them, such as coercion (Carney, 2001).

The historical and geographical evidence for these cultural processes is enormous. U.S. legal precedents have been adopted from England, France, Spain and ancient Rome (Ware, 1905; Weil, 1919). Other precedents have yet to be carefully assessed for their potential relevance (e.g., innovations in watershed management networks in Asia (WATMANET), irrigation organizations in the Andes, water codes in Africa and the European Union, to name a few).

But even as our conference planning group became aware of sophisticated work in comparable regions, the question of *how* these intriguing yet “foreign” examples might be transferred to the Western U.S., loomed large, and it is to this challenge that we now turn.

3. Transferring International Water Management Lessons To The American West: Four Theoretical Approaches

There are many promising approaches for seeking international lessons for the western U.S., beginning with practical case studies of concrete examples of actual historical transfers that have already occurred at different scales, from the irrigated plot or emitter to the complex river basin and global change debate. However, the charge of this paper is to focus on theoretical and methodological approaches that cut across these diverse scales and the substantive examples that will be explored in other sessions.

This section of the paper will thus begin with a discussion of the logic of water resources comparisons that occur in everyday practice and in common sense, which deserves close attention. Common sense comparisons cannot by themselves rebut the six counter-arguments raised at the beginning of this paper. Thus, this section of the paper also examines three formal models of cross-cultural comparison and exchange, which are: diffusion of innovation theory, social learning and social movement theories, and legal transplant theory.

A. Comparative Theory and Practice

Simple comparison of water management similarities and differences is common practice and common sense. Irrigators and lawn waterers observe their neighbors, as do water consultants, water utilities, water agencies, water activists and, increasingly, international water organizations. Professional organizations like the International Water Resources Association, the International Water Law Association, the Global Water Partnership, and World Water Council facilitate comparison at the international level.

Every table, matrix, graph, and map of water data is comparative, as are textual compilations and classifications of water laws (e.g., Easterly, 1977; FAO, 2002; Gleick, 2000; IWMI, 2002; Radosevich, 1976; and Wolf, 2002). However, the logic, uses, and utility of comparisons are less clear. Because informal comparisons are commonplace, it seems worthwhile to reflect upon their variety and logic (cf. Chodosh, 1999; Kahn-Freund, 1966, 1974; and Stein, 1997 for similar reflections on comparative law). The philosopher William James (1890) distinguished basic psychological processes of discrimination and association:

Discrimination/Difference:⁷

1. Existential discrimination (presence/absence)
2. Differential discrimination (determined through processes of analysis)
 - a. Differences in degree (greater/less)
 - a. Differences in kind
 - i. Difference of a significant constituent
 - ii. Difference across most or all constituents
4. Practical limits on discrimination
5. Refinement of discrimination through practice

Association/Similarity:

1. Association of the things thought-of
 - a. Identity of things (a=b)
 - b. Simile
 - c. Similarity of things (in degree, constituents, or type)
 - d. “Contiguity” contributes to association⁸
2. Association of thoughts or ideas
 - a. Identity of ideas
 - b. Similarity of ideas
 - c. Metaphorical association of ideas
 - d. “Train of thought” contribute to association

James’s typology is one of many that survey the wide variety of comparisons that we make in everyday practice. Such typologies help us decide which analytic methods (quantitative, qualitative, or hybrid) are appropriate to the type of comparison that is being made (e.g., Ragin, 1987). On the one hand, we have myriad comparisons in water data tables, graphs, and maps, but on the other hand, we have insufficient analysis of them to warrant sound judgments of similarity or difference. To indicate what is involved in such judgments, Nelson Goodman (1972) has identified “seven strictures on

⁷ Note that some of these processes lie at the heart of arguments against transferring water lessons based on the politics of difference, while others provide practical considerations but not fundamental objections to transfers.

⁸ Note similarity with the counter-argument based on “proximity” at the start of this paper. As contiguity literally means touching, rather than closeness or distance implied by proximity, it is not used here.

similarity” that elaborate the complex, unreliable nature of judgments of similarity. Our colleagues in the social sciences further inform us that the categories of comparison rarely remain stable, as social ideas about water management change and as social groups struggle over concepts, procedures, and scales of water management to achieve their political-economic and cultural, rather than logically consistent, ends (Michel, 2000).

Beyond relatively simple judgments of similarity and difference, comparative research extends into more complex reasoning by analogy (Glantz, 1988; Meyer, 1998; Wescoat and Glantz, 1998). Analogy has special relevance for transferring legal concepts and precedents, as will be discussed later in the paper. How often do we hear metaphorical references to water as “lifeblood,” “priceless”, or “sacred”? In recent years, frequent analogies, positive or negative, are drawn between privatization of water supplies in the U.S. with examples in Bolivia, Chile, England, France, as well as with earlier eras of public and private water utilities in 19th-century New York, Boston, and Philadelphia (Mentor, 2001). Our legal colleagues have much to contribute to our understanding of the logic, use, and misuse of analogies and precedents, especially our colleagues in Muslim legal contexts where analogy (*kiyas*) is a formal branch of Islamic law (Caponera, 1973; Getches, 1992; Hasan, 1986; Wescoat, 1995).

Regrettably, international water management comparisons rarely use these sophisticated approaches. They often entail simple juxtapositions of examples, selected unsystematically, from which readers may draw whatever they will, and rarely do so in a way that affects water management practice (Geertz, 1972). Thus, we need to proceed to more formal models for transferring potentially useful lessons from other parts of the world to the western U.S.

B. Diffusion of Innovations

Early interest in how innovations spread was pioneered by Gabriel de Tarde in his *Laws of Imitation* (1903). Quantitative diffusion models received a major impetus from agricultural modernization programs in the mid-20th century and most notably from the Green Revolution in Asia and the U.S., which involved adoption of hybrid seeds and associated irrigation, agrochemical, and labor inputs. Close to home, a geography dissertation modeled the diffusion of decisions to use center-pivot irrigation technology on the High Plains of eastern Colorado (Bowden, 1965). Internationally, the cases are too numerous to list here, but we can outline the key concepts and variables.

According to sociologist Everett Rogers (1995) a leader in this field for three decades, the following social actors and processes are involved:⁹

⁹ Cf. the useful website outline of Rogers’ work at <http://www.soc.iastate.edu/sapp/soc415.rogers.html>

Categories of Adopters:¹⁰

- Innovators
- Early adopters
- Early majority
- Late majority
- Laggards

Other Actors:¹¹

- Change agents
- Opinion leaders
- Opinion aides

Decision-Making Processes:¹²

- Awareness
- Persuasion
- Decision to adopt
- Implementation
- Confirmation (sustained adoption)

Social Criteria and Processes:¹³

- Relative advantage
- Compatibility
- Complexity
- Trialability
- Observability
- Re-Invention (Modifiability)

Diffusion of innovation research emphasizes communication processes, paths, and media to model patterns of contact and spread. It analyzes the difference that access to information makes, as well as frequency of contact with different communication media, networks, channels, structures, persons, and messages. Geographers, led by Torsten Hagerstrand's (1967) research group at Lund, Sweden, focused on spatial diffusion modeling and what was later called "space-time geography" (Brown, 1981; Morrill, Gaile and Thrall, 1988).

¹⁰ The bias of these categories toward innovators, and against traditionalists, is often noted.

¹¹ With the exception of anti-fluoridation studies, there has been less research, in this field, on the types of resistance leaders and movements that have played a growing role in anti-dam, anti-irrigation, and anti-privatization movements.

¹² Interesting phenomena include the respective roles of mass media and interpersonal communication, the needs paradox, in which those who need the benefits of adoption most adopt latest, and the so-called assimilation gap between adoption and actual use of an innovation (e.g., Fichman and Kemerer, 1995).

¹³ These are the most common criteria; others have added communicability, reversibility, uncertainty, commitments required, social and environmental impacts, etc.

While one set of criticisms focus on the bias of diffusion theories toward “adoption” and, by extension, modernization, and globalization (Blaut, 1993), even its advocates regard diffusion research as more descriptive than explanatory – somewhat akin to the type of legal research that one can do with automated Shepardizing to describe the paths of legal citation while doing little to explain them.¹⁴

C. Social Learning and Social Movements in Water Management

Where diffusion research describes how water management practices move through space and time, it offers limited insight into the psychological and social processes of development and change that facilitate transfers. Research on “social learning” and “social movements” focus, to a greater extent, on causal mechanisms and processes. Although they are rarely discussed together, they parallel one another in interesting ways, so their water resources implications are briefly together here.

Parson and Clark (1995) provide a useful survey of social learning theories applicable to adaptive ecosystem assessment and management (AEAM). As one of the key principles of adaptive management is that society can “learn by doing” ecosystem experiments (Daneke, 1983; Iles, 1996; Lee and Lawrence, 1986; Walters and Holling, 1990). Such experiments are underway in the California Bay-Delta (CALFED), Glen Canyon Dam (GCMRC), the Columbia River Basin, the Everglades, and the Upper Mississippi River Basin, to name some of the larger water-related programs in the U.S. (Jacobs and Wescoat, 2002).¹⁵

Parson and Clark (1995) discuss five major categories and contexts of social learning theory relevant to environmental management:

1. Individual learning in social settings and conditioned by social forces
 - E.g., rational actor v. behaviorist theories
 - Role of social environment in enabling or constraining individual learning

2. Learning by social groups and organizations
 - E.g. group learning as the sum of individual learning v. group learning as analogous to individual learning; single and double-loop learning
 - Problems of “audience learning” and “superstitious learning”

¹⁵ Duda (pers. comm., 2000) mentioned at a Stockholm water seminar that adaptive management is also underway in international projects of the Global Environmental Facility (GEF), such as its Danube and Black Sea programs.

3. Learning in and through science
 - Science as systematic objective v. messy heuristic process
4. Learning in policy-making
 - Short and long time scales
5. Evolutionary theories relevant to learning (e.g., on the limits and adaptive consequences of learning)

According to Parson and Clark, the key research questions on social learning include: Who learns? What do they learn? (e.g., behaviors, facts, concepts, works, skills, opinions, attitudes, and/or values). How did they learn? What counts as learning? And why ask? Although this last question may seem rhetorical, it is warranted because little social scientific research is currently underway on multi-million dollar adaptive management programs in the U.S. While millions are spent on ecosystem research and on coordinating stakeholder processes, little research focuses on how stakeholders actually use and act upon ecosystem monitoring data and research results (Jacobs and Wescoat, 2002; though for other fields, including business administration, see March, 1999).¹⁶

An important international initiative on social learning about global environmental issues is underway in the U.S. and Europe (Social Learning Group, 2001). This initiative examines how organizations and networks form to learn about ill-defined problems like global climate variability, stratospheric ozone depletion, biodiversity conservation, and acid rain – and to draw lessons for regional, national, and local policy – all of which has potential relevance for water management in the Western U.S.

Social movement theories parallel and complement those on social learning. They seek to explain how social groups organize to preserve or change human-environment relationships. Social movement theories range from individualistic psychological approaches, in which a disturbance generates anxiety, which leads to “resource mobilization” and collective action (e.g., Smelser, 1962; Tilly, 1978); to more contextual analyses of “political opportunity structures” that guide a movement’s strategy (Tarrow, 1994); to theories of about the dynamics of social ideology, hegemony and revolution (Gramsci, 1971); to the so-called “new social movements” that are transnational and transcultural in scope (Meleuchi, 1980).

Each of these theoretical perspectives sheds light on potential water management lessons in ways that may seem surprising. For example, psychological anxiety about the water resources implications of global climate change is evident in environmental journalism. Environmental activists actively strategize about political opportunity structures that enable or constrain mobilization of their resources and constituencies.

¹⁶ Though see the informal exchange of experience underway in a recently formed Adaptive Management Practitioners’ Network – <http://www.iatp.org/AEAM>

New social movements have arisen in opposition to large dams and privatization of water supplies and have used a wide array of social, geographical, and cyberspaces to organize. Revolutionary social change in countries like South Africa has facilitated water law reform.¹⁷ Although water movements can be exciting or aggravating, depending on where you stand, social movement theorists argue that such processes should neither be dismissed as special interests nor mythologized as utopian visions (see Rangan, 2000, on the Chipko movement).

By focusing on international events that can bring about individual and collective change, as compared with adoption or rejection of a foreign innovation by an otherwise unchanging social group, social learning and social movement research thus complements research on the diffusion of innovations (Miller, 2001). In addition, social learning and movements research sheds light on changes in water organizations, while diffusion research concentrates on water management technologies and legal precedents. To round out this theoretical survey, we need to take a closer look at theoretical perspectives on legal change.

D. Legal Mirrors and Legal Transplants

For non-water lawyers like me, water law is a fascinating and illuminating mirror of our culture and its relationships with nature. *Coffin v. Left Hand Ditch*, *Kansas v. Colorado*, *Audobon Society v. the Superior Court of Alpine County* – these cases, along with hundreds of others and associated water statutes, regulations, and law review articles fascinate me and my students. They help us understand how water users in different parts of the Western U.S. have adapted to their varied environments, transformed them, weighed alternatives, struggled for advantage, and adjusted to changing conditions. They are a great cultural archive. Even after years of study, however, we non-lawyers can at most contribute indirectly to legal change through various lines of scientific, historical, geographic, and policy research, which may or may not be used to reframe legal arguments, texts, and decisions.

Water laws do mirror environment-society relationships. For environmental determinists, like Semple (1919) and others, water laws reflect the influence of nature on culture. For social constructivists, from utilitarians to pragmatists and postmodernists, water laws adjust conservatively to changing social wants and values (Brint and Weaver, 1991; Bentham, 1962; Maine, 1888). For law and economics theorists, legal change is driven by economic forces while for social movement theorists the primary forces are political.

¹⁷ It should be noted that while these examples are important for the water resources field, they remain relatively small and peripheral relative to broader human rights, feminist, anti-poverty, and environmental movements)

These competing arguments about what shapes water laws, and thus what those laws reflect, share a common belief that laws primarily mirror something beyond themselves (Ewald, 1995). At the other end of the spectrum lie the so-called theories of “black-letter law” where legal texts are interpreted more literally and self-referentially. For Watson, a Roman law specialist and comparativist, the most theoretically compelling approaches lie between these two poles, in what he called theories of legal transplants (Watson, 1976, 1993).

Briefly, a legal transplant is a law drawn from one place and time and applied in another, often with modification. Close to home, a decision in the Division 1 Water Court in Greeley in 2001 might influence a decision in the Division 5 Water Court in Glenwood Springs in 2002. Further afield, attorneys might invoke a Roman *praetor*’s interdict to argue a case on the Mississippi River, the Arkansas River, Lake Michigan, Texas, or Mono Lake (Baade, 1990, 1992; Sax, 1971; Wescoat, 1997). Proposed transfers may be rejected, as when provisions of the 1873 Canal and Drainage Act in India were explicitly deemed incompatible with legal and social conditions in the San Joaquin Valley of California, also in 1873 (Wescoat, 2001).¹⁸ Contemporary research on legal transplants relevant for the U.S. draw upon developments in international environmental law more than municipal law, which involves transfers across jurisdictional scale as well as space (Tarlock, 1997; The Social Learning Group, 2001; Wiener, 2001; and Wouters, 1997).

In summary, legal transplant theorists argue, first, that transfers are common; second, they involve legal change, as such, as well as whatever other social and environmental phenomena they might mirror; third, that transplants are directed by legal elites; and fourth, that the reception of legal transplants depends upon several practical factors.¹⁹ Legal transplants are not entirely dependent upon or independent of other social and environmental processes. Instead, legal elites and elite legal institutions decide what legal transplants will and will not occur (Watson, 1995).²⁰ Other comparativists do not deny that laws travel, but they do debate the degree of external influence on legal change and alternative arguments about the purpose, efficiency, and social reception of legal transplants (Heim, 1996; Kahn-Freund, 1974; Markesinis, 1990; Mattei, 1994; Reimann and Levasseur, 1998; Stein, 1997; Watson, 1996).

Legal transplant theories seem to have at least four lines of relevance for this conference: first, contrary to Watson’s argument about the frequency of legal transfers,

¹⁸The term “legal transplants” does not appear once in case law of the federal government or any of the western states. LEXIS/NEXIS Legal Universe, all courts and dates; consulted 12 May 2002. Cf. Butterworth, 1980, on transplants in oil and gas conveyancing.

¹⁹ These vary by author, some stressing simplicity and fairness (Morriss, 2001). Watson (1996) mentions four factors: extreme practical utility, chance, difficulty of clear sight, and need for authority.

²⁰ Elite concerns for status and authority may help explain the more common recourse to Roman and modern European law than to less familiar but also less regarded Islamic, African, and Asian laws.

we have observed declining international influence during the 20th century, notwithstanding increasing international sophistication; second, if useful legal precedents are “out there,” then theoretical and methodological perspectives from research on the diffusion of innovations, social learning and social movements may help explain where and how they might be transferred; third, following Watson and Ewald, if legal transplants have their own logic in elite legal institutions, far greater attention to comparative water law will be needed to identify and effect promising legal transplants in the western U.S.; and finally, if legal transplants do depend upon elites, uneven power relations and coercion among those elites must be followed with special concern for equity and sustainability.

4. Conclusions and Implications

The four trends and theoretical perspectives reviewed here indicate that there are historical precedents and sound theoretical approaches for transferring water management lessons from distant places and times to the western U.S. There are many substantive international innovations worthy of consideration. This conference focuses on several promising topics, including: transbasin management; market mechanisms; modeling; management strategies: from local institutions to national plans; balancing water for people and the environment; global water issues; sustainability; and transboundary conflict and cooperation. To these we might add rapid international advances in irrigation management, watershed management, and water law reform.

While we have observed declining attention to international experience in many spheres of western water management in the 20th century, which indicates limited awareness, we have also witnessed increasing international involvement in ways that facilitate comparison and plant the seeds for drawing lessons other places (Bradlow, 2000; Freeman, 1989). With advances in water management around the world, the time seems right for more balanced and informed attention to cultural exchange of water management solutions.

The theoretical section of this paper argued that academic curiosity and simple comparison and contrast help identify promising transfers but do little to implement them. Research on the diffusion of innovations helps forecast where and how such transfers can most likely occur. Diffusion by itself is insufficient to transfer sustainable water management practices, which requires social learning and movements to understand how and why change occurs. Sustainable transfers also depend upon a deeper understanding of the logic and pitfalls of legal transplants. Sustainable legal transplants, in turn, require more serious academic engagement with comparative water law and policy -- which brings us back full circle to the important initial role of basic compilations and comparisons -- in this brief theoretical survey. Collectively, these theoretical and methodological approaches seem capable of fruitfully analyzing the rich body of historical-geographic evidence on international water policy transfers, identifying

promising new transfers, and of responding creatively to the counter-arguments listed at the beginning of this paper.

It seems important to recognize as well that western water managers are pragmatists. They (we) prefer concrete, useful, and familiar solutions to academic research, let alone foreign ideas and approaches. We focus in everyday practice more on the means than the ends of solving water management problems. This paper has likewise striven for a pragmatic philosophical approach to the transfer of lessons from distant places and times, with the hope that some of the above is useful in assessing substantive examples in the sessions that follow.

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