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*Guest Editorial*, part of a Special Feature on [Realizing Water Transitions: The Role of Policy Entrepreneurs in Water Policy Change](#)

## **Realizing water transitions: the role of policy entrepreneurs in water policy change**

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**ABSTRACT.** This special feature aims to further our understanding of the way in which transitions occur in water management. We contend that if we want to understand such transitions, we need to understand policy change and its opposite, policy stability. These issues have attracted considerable academic attention. Our interest is, however, very specific and thereby unique: we review the role that (groups of) individuals play in the process of preparing, instigating, and implementing policy change. In this article, a review of the literature on policy change provides the basis from which we extract a set of strategies which are available to policy entrepreneurs. The questions for the rest of this special feature are first, can we detect the influence of policy entrepreneurs in actual cases of major policy change, and second, which strategies have they actually used to affect policy change?

**Key Words:** *case studies; policy change; policy entrepreneurs; transition management; water management*

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### **INTRODUCTION**

Water managers have a complicated task. They are faced with relatively high levels of uncertainty surrounding the consequences of their actions because they are dealing with social-ecological systems that exhibit complexity, non-reducibility, spontaneity, variability, and a collective quality (Dryzek 1987, Folke et al. 2005, Huitema et al. 2009). Water managers do not and will not completely know the social-ecological systems they are intervening in but must address current issues such as climate change, which will potentially lead to more extreme weather events and rising sea levels (see for example Easterling et al. 2000, Cabanes et al. 2001, Gleick et al. 2001, Alley et al. 2005).

The concepts of adaptation and adaptability are of relevance here. Young et al. (2006) define adaptation as the process of change in response to structural circumstances. Effective adaptation results in adaptedness, meaning that a certain dynamic structure is effective in dealing with its current external environment. Young et al. (2006) suggest that adaptability is more of a meta-

characteristic of the social-ecological system. It is about the capacity to adapt to future changes in the environment of that particular system.

Analyzed in these terms, water managers across the globe have often achieved high levels of adaptedness and thereby served their societies well. However, they have tended to do so mainly through application of the traditional engineering approach to water management. Over the past decades, the deficiencies of this approach have become increasingly clear – as witnessed for instance by the debate on the social and ecological damage caused by dams, and the complications related to large-scale human settlements in arid and semi-arid regions (see for example World Commission on Dams 2000, Gleick 2003, Stone 2008). In many cases, one can therefore speak of “maladaptation”, an unsustainable form of adaptedness. This situation is aggravated by the fact that in many cases the establishment of large-scale infrastructure has led to “lock-ins”. Much societal investment is based on the existence of this infrastructure, creating large dependencies on it. In addition, the institutional and knowledge systems surrounding water management

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are geared towards maintaining this infrastructure, making it even harder to reverse some of the interventions in the past. The adaptability of existing approaches to water management can thus be questioned. The fact that we do nevertheless witness transitions in the field of water management does not contradict this basic observation. Many changes tend to occur only after the existing paradigm on water management has been put to the test by disastrous events and resulting serious damage of some sort, for instance through floods.

This means that “transitions” and “transition management”, that is, ways of inducing radical changes which hinge less on external shock events are warranted. With this special issue, we wish to connect to the literature on transitions and explore them in the domain of water management (for further elaboration upon these concepts, see Schot et al. 1994, Kemp et al. 2001, Rotmans et al. 2001, Geels 2002, Smith et al. 2005, Kemp et al. 2007; for treatment of transitions in this journal, see Olsson et al. 2006, van der Brugge and van Raak 2007).

Our take on transitions is special in the following respects. First, we equate transitions with radical or fundamental change in government policy or public policy. We do this while acknowledging that policy change is but one element of a transition. Yet we contend it is an important one, even at a time when it has become popular to speak of “governance” instead of “government” (Jordan et al. 2010). Governance refers to the empirical reality in which governing has become more of a multi-level and multi-actor game that is being played by both governmental and non-governmental actors; the articles in this special feature highlight this phenomenon. However, leading authors on the “shift from government to governance” such as Pierre and Peters (2000), support us in our focus on governmental policies as they go to great lengths to emphasize that governments will continue to play an important role in public decision processes. That is why their strategies and actions warrant a good deal of attention.

Second, our focus is on policy change at the level of the nation state. This goes somewhat against the current fashion in academic literature, which tends to emphasize the shifts in governance from the national state to the international level, lower levels of government, specialized bodies, civil society, or the market (e.g., Rhodes 1994, Skelcher 2000). However, national governments still hold a lot of

sway, if not by controlling “lower” levels of government, such as municipalities and provinces, or by sanctioning the outcomes of private governance, then by influencing – with other governments – the actions of international organizations (Pierre and Peters 2000). Rather than focusing on a particular geographical scale, such as a river basin or catchment area, this special issue focuses on one specific jurisdictional level: the nation state. We are aware that nation states do have largely different geographical sizes, and that this may have consequences for the ways in which policies can be changed and for policy implementation. As we will argue in the next sections, however, our research design is aimed at finding similarities among processes of national policy change rather than at finding differences.

Third, we specifically wish to investigate the role of individuals or groups of individuals in instigating transitions, thus asking questions about leadership (see Olsson et al. 2006). While this may at first appear an elitist orientation, for us the real issue at stake is the one of agency, on the part of elites or actually any group of actors. We find this relevant because it is becoming increasingly clear that disasters or other “shock events” may provide the most important impetus for policy change, but also that actual responses to shock events in no way bear a one-on-one, logical, relationship to these triggers (see for instance Birkland 1997, 1998). In fact, policy change in many cases has to be prepared in advance, and this is done by individuals who work hard to develop and sell alternative approaches. This is why, in this special issue, we explore the role of “policy entrepreneurs” in instigating, implementing, and sometimes blocking policy change. Insight into their role in stimulating policy change is crucial if we want to develop a more systematic approach to adaptability that is less dependent on shock events to trigger transitions.

Having outlined the specific way in which we engage with the debate on transitions, we can state our central set of research questions: which strategies have policy entrepreneurs used to realize water transitions, and to what extent have those strategies been successful? Which strategies are used to block transitions and to what extent have they been successful?

In order to provide a better grounding for the following papers, the second section of this article outlines the theoretical points of departure for our

research. We will show that the policy sciences literature, although very cautious about the possibilities to direct change, does offer fertile ground for developing ideas on the strategies that policy entrepreneurs may use. The third section presents a set of strategies for affecting transitions, which we have derived from a critical review of the policy science literature. The fourth section summarizes our methodology. The term “most different systems approach” is introduced. This approach is based on the notion that finding a relation between two variables under a range of very different circumstances is an indication of the validity of the finding. Here, we are interested in the presence of policy entrepreneurs and their strategies on the one hand, and policy change on the other. To see whether this is a robust relation, we studied a number of transitions in countries that are different in many ways (for instance, in their perception of environmental problems, in their legal systems, in their cultural outlooks, in the influence of civil society on policy-making, in geographical scale, etc.). We made no attempt to make a systematic inventory of these differences; instead, we posit that if we find a connection between policy entrepreneurs and policy change in all of these systems, this corroborates our hypothesis that policy entrepreneurs really do make a difference in bringing about transitions in water management.

## **THEORETICAL POINTS OF DEPARTURE**

The policy sciences provide the theoretical framework for the analyses presented in this special feature. This is perhaps not the most obvious choice when discussing transitions because analyses from this field will provide only a partial analysis of the puzzle. However, we concur with Dewulf et al. (2008), who surveyed the literature on transitions and contested the need for an integrated theory of transition management, which would necessarily be eclectic and thus somewhat fragmented in nature. Instead, they suggest that multiple theories continue to be needed because they provide a set of conceptual tools to analyze situations and design interventions. They advocate that the distinctness of theories from various disciplines is relevant for understanding transitions, and they plead for “theoretical pluralism”, which could be made fertile by the exploration of areas where theories overlap and could subsequently inform each other. With this special feature, we are acting in this vein. The feature is intended as a contribution to the transition

management literature from one discipline, the policy sciences. Within this discipline we look at various theories of policy change and assess the extent to which they specify a role for policy entrepreneurs in achieving such change.

The policy science literature itself comprises a large variety of approaches and theories, which are based on different ontological, epistemological, and theoretical stands. Sets of theories that have informed policy sciences include: institutional approaches, group and network approaches, socio-economic approaches, rational choice theory, and ideas-based approaches (John 1998). Given our research interest in radical policy change and the strategies of policy entrepreneurs, a wide range of theories on policy continuity and change is of relevance to our work, including the punctuated equilibrium framework (e.g., Baumgartner and Jones 1991), the multiple streams framework (Kingdon 1984), the advocacy coalition framework (Sabatier 1993), discourse theory (Hajer 1995), and policy network theory (e.g., Kickert et al. 1997). Since our focus is on major policy change, we have not included the highly influential Institutional analysis and development framework, which treats institutional change incrementally (Schlager 1999).

We have examined the relevant policy science theories for what they have to say on the roles and strategies of policy entrepreneurs. It is important to acknowledge that most theories from the policy sciences suggest that radical policy change is rare and next to impossible to be managed by an individual or a group of individuals. In this sense, our reading of this literature is very much a reinterpretation, inspired by the hopeful working hypothesis that individuals can make a difference. Why do the established theories on policy change cast so much doubt as to whether policy change can be deliberately affected? There are several lines of reasoning. A strong current of thought contends that policy change is a random process, one that is subject to little direction and planning (Kingdon 1984). Another stream of studies suggests that policy subsystems are resistant to change and that radical policy change happens only when the existing paradigm succumbs under external pressure and is “punctuated” (see Baumgartner and Jones (1991) for the foundation study of this stream). Yet another group of authors (inspired by Sabatier and Jenkins-Smith 1993) posits that policy change is nearly impossible in the absence of external shock events.

Given the need for adaptability and change across many policy domains, the emphasis in these studies on resistance to change and the impossibility of deliberately instigating it is somewhat worrying. The stakes are potentially high, particularly when the problem concerns ecological systems that involve “tipping points” beyond which their state alters fundamentally, resulting in severe, irreversible consequences (see for example Lenton et al. 2008). Rapid and radical policy change may be the key to the survival of societies as we know them today (see Duit and Galaz 2008). In this respect, this special issue puts forward a more optimistic hypothesis than the one supported by much of the policy sciences literature. Fortunately, more recent scholarship, such as work by Birkland (1997, 1998) and Olsson et al. (2006), indicates that policy change can perhaps not be managed in the sense of being preplanned and centrally controlled, but that it can at least be prepared for and “navigated” from point to point. This gave us reason to revisit the various theoretical models mentioned above, and to examine what they have to say about agency in policy change. Somewhat surprisingly, each of the models we examined suggests that certain individuals and organizations can affect policy change, and indicates how they may succeed in doing so. The type of individual we are interested in is recognized in the policy sciences and other literatures as a change agent, which is sometimes described as a “boundary spanner”, a “policy advocate”, or a “visionary leader”. The differences between these terms are not the subject of discussion here, and mentioning them only serves to indicate the type of players that we have in mind. All change agents will be referred to throughout this special issue as “policy entrepreneurs”. This term has been defined as “people willing to invest their resources in return for future policies they favor. They are motivated by combinations of several things: their straightforward concern about certain problems, their pursuit of such self-serving benefits as protecting or expanding their bureaucracy’s budget or claiming credit for accomplishment, their promotion of their policy values, and their simple pleasure in participating” (Kingdon 1984: 214).

## **STRATEGIES FOR AFFECTING TRANSITIONS**

Who are policy entrepreneurs and how do they affect change? As Bachrach and Baratz (1970) show, change can be instigated both from within

and from outside of government. Within government, the individuals seeking change may be politicians or bureaucrats. Outside of government, they can be representatives of non-governmental organizations (NGOs), academics, or individual citizens. Working to achieve policy change obviously involves different challenges for different types of policy entrepreneurs. For instance, the political leader may have a political party and a bureaucracy to back him or her, which the employee of a small NGO probably does not. The more or less generic strategies listed below may or may not be at the disposal of any particular player. Whether or not various types of individuals seeking change have access to and are able to use a certain strategy is an empirical question which is answered in the cases analyzed in this special feature. Although we do not suggest that the strategies below are necessarily used in chronological order, for ease of presentation, they are listed as if for application in sequence. In reality, we expect the strategies to be applied in very different ways and combinations to suit varying circumstances and types of policy entrepreneurs. Which strategies are used and combined, in which order, by whom, and to what effect is an empirical question that will be explored in more detail in the empirical articles that are part of this special feature.

### **(1) The development of new ideas**

Infrastructure and regulation in water management can be seen as an expression of the very ideas that guide their development. These ideas, sometimes referred to as “policy paradigms”, are sometimes also called “hegemonic policy discourse” or “institutionalized policy monopoly”. Aiming for policy change then requires the development of an alternative idea or approach for managing water, described in the literature as a new policy frame (Schön and Rein 1994), a new policy image (Baumgartner and Jones 2002), alternative system configurations (Olsson et al. 2006), an alternative policy path (Pierson 2000, 2004), new long-term visions and transition agendas (van der Brugge et al. 2005), or a new story line (Hajer 1995).

There is a long-standing debate in the policy sciences on the relative importance of ideas as opposed to interests (for example, Majone 1992). We do not take a position in this debate here. We are sympathetic to the notion that ideas shape interests but are also aware that (perceived) interests can be a motivating factor behind the development

of ideas. The link between interests and ideas may vary according to the forum as, for example, the discourse of scientists occurs in an environment that is less accepting of interest-based arguments than the forum of markets or the realm of politics, which allow for a much more open expression of interests. We contend, however, that policy change requires at least the germ of an idea to provide the general direction in which the situation might change. The policy sciences suggest that more extreme visions of alternative futures develop among actors who are outside of government. Since they are freer from formal constraints, they are more likely to push for major rather than incremental change (see for instance Roberts and King 1996, Sabatier and Weible 2007).

### (2) Build coalitions and sell ideas

There are few actors who can manage policy change on their own. The degree to which collaboration is needed depends on various factors, including the extent of change sought and the institutional arrangements surrounding the decision-making process. At the very basis, however, collaboration appears to be necessary in any situation, and by implication, drives the building of coalitions. Such coalitions are referred to as “discourse coalitions”, “advocacy coalitions”, and “shadow networks”. Coalition building is often a delicate task because it entails sensitive issues such as differences of opinion and power asymmetries among actors. Various theories from the policy sciences propose different mechanisms through which coalitions are formed, again raising questions for the following articles. Discourse analysts such as Hajer (1995) suggest that story lines or narratives, preferably with a certain ambiguity or openness to multiple interpretations, are crucial in attracting new actors to novel ways of understanding. This attraction is referred to by Hajer as “affinity”, a concept that stresses the importance of jointly developing a fresh vision in coalition building. Benford and Snow (2000) think along similar “ideational” lines as they emphasize “frame alignment” as the key factor in coalition building. Sabatier (1993) sees coalition building as a way to pool resources, observing that coalition-building efforts emphasize shared beliefs and explicit agreements on how to use the resources of the actors involved to achieve common goals.

### (3) Recognize and exploit windows of opportunity

The relevance of John Kingdon’s concept of a “window of opportunity” for understanding policy

change (Kingdon 1984) is widely acknowledged. Windows are particular moments in time (for instance an election or disaster) that offer opportunities for policy entrepreneurs to launch and gain support for new policy proposals. Such windows, however, need to be recognized and exploited, a key challenge for policy entrepreneurs. These are typically the actors who recognize problem or political windows and work to open and expand them. They do so by linking solutions to problems and by working to get the resulting policy packages accepted by decision makers, thus bringing about a convergence of the problem, policy, and political streams. According to Kingdon, policy entrepreneurs can be found anywhere but they share some important characteristics: they often have a good reputation and good networking skills and are willing to invest resources, most notably time, in a change process. To be successful, policy entrepreneurs need to be both good advocates of new policy ideas and good policy brokers.

### (4) Recognize, exploit, create, and/or manipulate the multiple venues in modern societies

The existence of multiple venues offers an opportunity to policy entrepreneurs, but unlike a policy window, does not always refer to a particular moment in time. The opportunity is created by characteristics of the institutional context policy entrepreneurs are operating in. Irrespective of the opening of a policy window, there are always multiple venues (such as political and administrative venues on different levels of government, scientific venues, or the media). There are three types of strategies related to venues. First, “venue shopping” describes the strategic behavior associated with the choice between the various possible venues where an individual or group can try to effect change. When engaged in venue shopping, policy actors “try to alter the roster of participants who are involved in the issue by seeking out the most favorable venue for the consideration of their issues” (Baumgartner and Jones 1991: 1045; compare Richardson 2000, Pralle 2003). In this process, both the institutional structures within which policies are made and the individual strategies of policy entrepreneurs play important roles (Baumgartner and Jones 1991: 1045). Within government, actors may decide to bypass a decision process that offers unfavorable terms for presenting their arguments, waiting instead for the next opportunity. Alternatively, actors can seek to exploit venues for putting forward arguments that were not originally intended for that

particular forum, thereby attempting to change the nature of the venue. Secondly, policy entrepreneurs may try to manipulate the composition of venues so as to have their own coalition members represented, and to bypass those who resist change. Finally, they may deliberately try to create new opportunities for launching their policy ideas by creating new venues.

#### (5) Orchestrate and manage networks

Coalitions are characterized by an (implicit) agreement on particular policy ideas or objectives, either because coalition members share similar beliefs or because they are mutually dependent. We define networks as a much broader range of actors that is relevant to solving a particular water issue, either because these actors perceive a water-related problem or because they possess indispensable means for solving a water issue. Unlike members of a coalition, those actors might not share any policy idea or objective. They may even be a member of opposing (advocacy) coalitions. Some see networks as spontaneous, self-organizing entities. From a state-centrist view, this is correct because networks will exist without state intervention, although the state can actively alter the existence and operation of networks. However, a less state-centered view sees networks as far from self-organizing and spontaneous. In fact, considerable effort often goes into creating and maintaining a network. Policy networks range in nature; they can be relatively closely knit and well aligned in terms of collective views and actions (policy communities), but they can also be rather ad hoc and short lived (issue networks) (Rhodes and Marsh 1990). Fundamental policy change is likely to require the alteration, manipulation, breaking open, or breaking up of policy communities that have crystallized around a specific policy domain. Policy scientists have focused much attention on developing network typologies and strategies for network orchestration, and have identified two such strategies (Kickert et al. 1997, Meier and O'Toole 2001): management of the interactions within the current network settings, or creation or change of the current network setting.

## METHODOLOGY

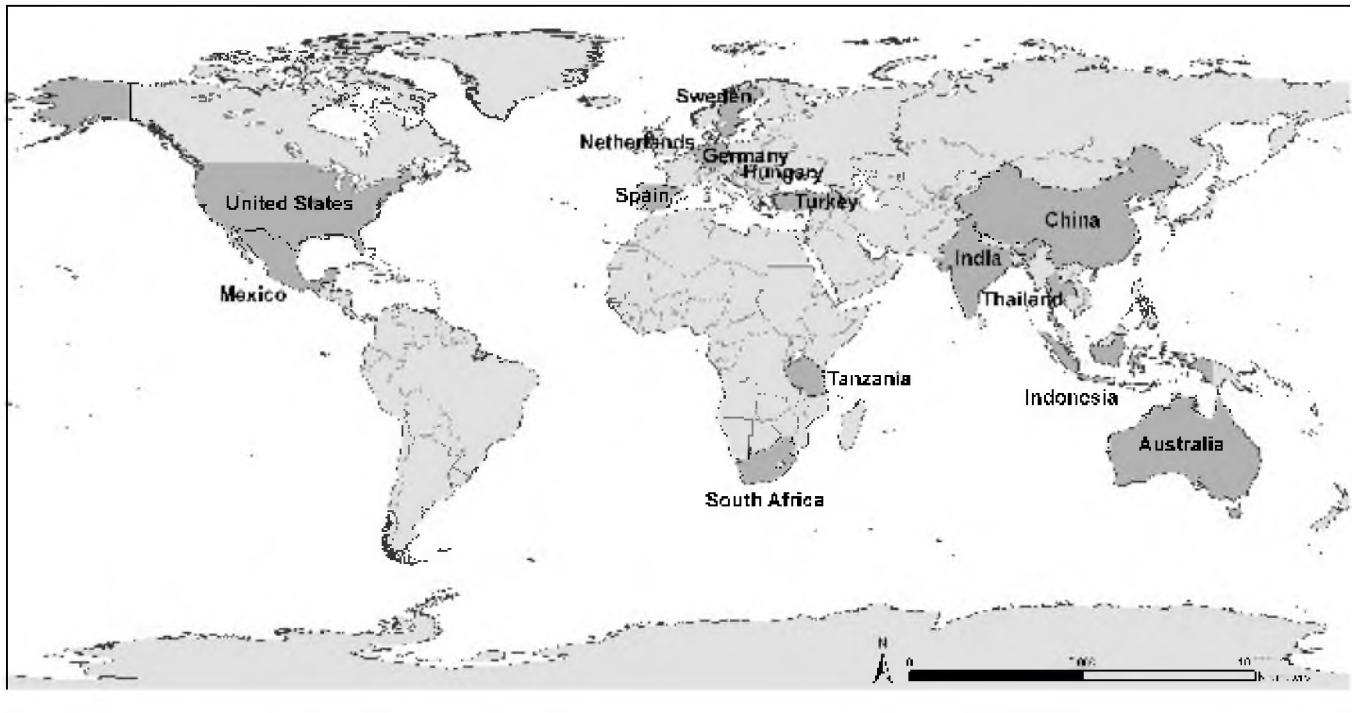
This special feature contains narratives on water transitions in Spain (Font and Subirats 2010), Mexico (Wilder 2010), China (te Boekhorst et al. 2010), and Hungary (Werners et al. 2010). The

stories presented are only a subset of the 15 countries and the two international analyses included in a book by Huitema and Meijerink (2009). Figure 1 shows which countries were included in the book; they form the basis for the overall analysis reported in the final article of this special feature.

What guided the selection process of the case countries? No plan existed beforehand to include specific countries, and their selection was not theory-led. This does not invalidate the comparison of the cases presented in the last article of this special feature, however. We have applied a "most different systems approach" (Hopkin 2002), which sometimes is also called a "most different systems design" (Anckar 2008). This approach consists of comparing a series of very different cases which, however, have in common the same dependent variable: in our case, a major change in national policies. It works on the understanding that "[I]f a hypothesized relationship between two or more variables is replicated across a wide variety of different settings, then there are strong grounds for arguing that there is a causal link between the variables" (Hopkin 2002: 255). We have approached an international comparison in this spirit. The set of countries that we have analyzed, both in the book and this special feature, is highly varied. We wanted to include case studies from all continents, from low-income, middle-income, and high-income countries, from large and small countries, from countries with different political regimes, different cultural outlooks, different national environmental situations, and so on. Within this condition of maximizing contextual variety, we have taken a pragmatic approach in that we wanted to work with scholars who are familiar with or have affinity with the policy science perspective outlined above. That is why both the reactions to a specific call for papers and our personal networks have played a crucial role in the case selection process (for a more elaborate explanation, see Huitema and Meijerink 2009).

If our hypothesized relationship between policy entrepreneurs and policy change mediated through policy entrepreneurs' strategies can be found across a diversity of settings, this will support our claim that policy entrepreneurs are important to policy change. Because of this methodological approach, the contributors to this special feature have kept the discussion of contextual variables, such as the political regime, and of the national environmental situation, to a minimum. We were, however,

**Fig. 1.** Case studies of water policy change.



interested in the degree to which the variable of institutions (decision-making rules) constrained or enabled policy entrepreneurs to bring about change. This singles out only one aspect of the many ways in which the countries are different but holds relevance because it accounts for the possibility, for instance, that a policy entrepreneur operating in the autocratic policy system of China could be more constrained than a policy entrepreneur in the relatively open Spanish system.

Naturally, as the emphasis is on explaining change, the authors have analyzed instances where transitions have been made more or less successfully. This approach largely precludes the analysis of failed transitions, which could be equally interesting from an analytical perspective. We found this a price worth paying because part of our research agenda is to develop lessons on how to direct change; thus, examples of the most successful changes can be very instructive.

Typically, the authors have used secondary analysis of the existing literature, documentation analysis,

and a set of interviews to describe and examine the dynamics in a particular country. In many cases, the authors have years of experience in analyzing water management in the country concerned. Several measures have been taken to enhance comparability of the case studies. All authors were asked to read the chapter on theory as a basis for their analysis. This effectively meant that authors would identify policy entrepreneurs and their strategies and assess the effectiveness of these strategies in terms of policy change. A meeting with all authors in July 2008 clarified and improved the theoretical framework, and brought about an internal review process, which increased the coherence of the work presented here. We hope the results help the further the development of a grounded theory on policy entrepreneurship and transitions.

*Responses to this article can be read online at:*  
<http://www.ecologvandsocietv.org/vol15/iss2/art26/responses/>



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## LITERATURE CITED

- Alley, R. B., P. U. Clark, P. Huybrechts, and I. Joughin. 2005. Ice-sheet and sea-level changes. *Science* 310(5747):456–460.
- Ankar, C. 2008. On the applicability of the most similar systems design and the most different systems design in comparative research. *International Journal of Social Research Methodology* 11 (5):389–401.
- Bachrach, P., and M. S. Baratz. 1970. *Power and poverty; theory and practice*. Oxford University Press, Oxford, UK.
- Baumgartner, F. R., and B. D. Jones. 1991. Agenda dynamics and policy subsystems. *Journal of Politics* 53(4):1044–1074.
- Baumgartner, F. R., and B. D. Jones, editors. 2002. *Policy dynamics*. University of Chicago Press, Chicago, Illinois, USA.
- Benford, R. D., and D. A. Snow. 2000. Framing processes and social movements: an overview and assessment. *Annual Review of Sociology* 26:611–639.
- Birkland, T. A. 1997. *After disaster: agenda setting, public policy, and focusing events*. Georgetown University Press, Washington, D.C., USA.
- Birkland, T. A. 1998. Focusing events, mobilization, and agenda setting. *Journal of Public Policy* 18(1):53–74.
- Biswas, A. K. 2004. Integrated water resources management: a reassessment. *Water International* 29:398–405.
- Cabanes, C., A. Cazenave, and C. le Provost. 2001. Sea level rise during past 40 years determined from satellite and in situ observations. *Science* 294 (5543):840–842.
- Dewulf, A., K. Termeer, R. Werkman, and G. Breeman. 2008. Steering system innovations – a theoretical exploration of transition management. *15<sup>th</sup> Annual Conference on Multi-Organizational Partnerships, Alliances and Networks (MOPAN)*, Boston, Massachusetts, USA, 25–27 June 2008.
- Dryzek, J. 1987. *Rational ecology: environment and political economy*. Basil Blackwell, New York, USA.
- Duit, A., and V. Galaz. 2008. Governance and complexity – emerging issues for governance theory. *Governance* 21(3):311–335.
- Easterling, D. R., G. A. Meehl, C. Parmesan, S. A. Changnon, T. R. Karl, and L. O. Mearns. 2000. Climate extremes: observations, modelling, and impacts. *Science* 289(5487):2068–2074.
- Folke, C., T. Hahn, P. Olsson, and J. Norberg. 2005. Adaptive governance of social-ecological systems. *Annual Review of Environmental Resources* 30:441–473.

- Font, N., and J. Subirats.** 2010. Water management in Spain: the role of policy entrepreneurs in shaping change. *Ecology and Society* 15(2): 25. [online] URL: <http://www.ecologyandsociety.org/vol15/iss2/art25/>.
- Geels, F. W.** 2002. Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Research Policy* 31(8/9):1257–1274.
- Gleick, P.** 2003. Global freshwater resources: soft-path solutions for the 21st century. *Science* 302(5650):1524–1528.
- Gleick, P., A. Sing, and H. Shi.** 2001. *Threats to the world's freshwater resources*. Pacific Institute, Oakland, California, USA.
- Hajer, M. A.** 1995. *The politics of environmental discourse: ecological modernization and the policy process*. Oxford University Press, Oxford, UK.
- Hopkin, J.** 2002. Comparative methods. Pages 249–270 in D. Marsh and G. Stoker, editors. *Theory and methods in political science*. Second edition. Palgrave MacMillan Ltd., Houndsmills, UK.
- Huitema, D., and S. Meijerink,** editors. 2009. *Water policy entrepreneurs: a research companion to water transitions around the globe*. Edward Elgar Publishing, Cheltenham, UK.
- Huitema, D., E. Mostert, W. Egas, S. Moellenkamp, C. Pahl-Wostl, and R. Yalcin.** 2009. Adaptive water governance: assessing the institutional prescriptions of adaptive (co-) management from a governance perspective and defining a research agenda. *Ecology and Society* 14(1): 26 [online] URL: <http://www.ecologyandsociety.org/vol14/iss1/art26/>.
- John, P.** 1998. *Analysing public policy*. Cassell, London, UK.
- Jordan, A., D. Huitema, H. van Asselt, T. Rayner, and F. Berkhout,** editors. 2009. *Climate change policy in the European Union: confronting the dilemmas of mitigation and adaptation?* Cambridge University Press, Cambridge, UK.
- Kemp, R., D. Loorbach, and J. Rotmans.** 2007. Transition management as a model for managing processes of co-evolution. *The International Journal of Sustainable Development and World Ecology* 14:78–91.
- Kemp, R., A. Rip, and J. Schot.** 2001. Constructing transition paths through the management of niches. Pages 269–299 in R. Garud and P. Karnøe, editors. *Path dependence and creation*. Lawrence Erlbaum, London, UK.
- Kickert, W. J. M., E. H. Klijn, and J. F. M. Koppenjan.** 1997. *Managing complex networks. Strategies for the public sector*. Sage, London, UK.
- Kingdon, J. W.** 1984. *Agendas, alternatives and public policies*. Harper Collins, New York, New York, USA.
- Lenton, T. M., H. Held, E. Kriegler, J. W. Hall, W. Lucht, S. Rahmstorf, and H. J. Schellnhuber.** 2008. Tipping elements in the Earth's climate system. *Proceedings of the National Academy of Sciences*. Online Early Edition, February 4, 2008.
- Majone, G.** 1992. *Evidence, argument and persuasion in the policy process*. Yale University Press, New Haven, Connecticut, USA.
- Meier, K. J., and L. J. O'Toole, Jr.** 2001. Managerial strategies and behavior in networks: a model with evidence from U.S. public education. *Journal of Public Administration Research and Theory* 11(3):271–294.
- Olsson, P., L. H. Gunderson, S. R. Carpenter, P. Ryan, L. Lebel, C. Folke, and C. S. Holling.** 2006. Shooting the rapids. Navigating transitions to adaptive governance of social-ecological systems. *Ecology and Society* 11(1): 18. [online] URL <http://www.ecologyandsociety.org/vol11/iss1/art18/>.
- Pierre, J., and B. G. Peters.** 2000. *Governance, politics and the state*. Palgrave Macmillan, New York, New York, USA.
- Pralle, S. B.** 2003. Venue shopping, political strategy, and policy change. The internationalization of Canadian forest advocacy. *Journal of Public Policy* 23(3):233–260.
- Rhodes, R. A. W.** 1994. The hollowing out of the state: the changing nature of the public service in Britain. *The Political Quarterly* 65(2):138–151.
- Rhodes, R. A. W., and D. Marsh.** 1990. Policy

networks: a British perspective. *Journal of Theoretical Politics* 2(3):293–317.

**Richardson, J. J.** 2000. Government, interest groups and policy change. *Political Studies* 48 (5):1006–1025.

**Roberts, N. C., and P. J. King.** 1996. *Transforming public policy*. Jossey-Bass, San Francisco, California, USA.

**Rotmans, J., R. Kemp, and M. van Asselt.** 2001. More evolution than revolution: transition management in public policy. *Foresight* 3(1):15–31.

**Sabatier, P. A.** 1993. Policy change over a decade or more. Pages 13–39 in P. A. Sabatier and H. C. Jenkins-Smith, editors. *Policy change and learning: an advocacy coalition approach*. Westview Press, Boulder, Colorado, USA.

**Sabatier, P. A., and H. C. Jenkins-Smith,** editors. 1993. *Policy change and learning: an advocacy coalition approach*. Westview Press, Boulder, Colorado, USA.

**Sabatier, P. A., and C. M. Weible.** 2007. The advocacy coalition framework: innovations and clarifications. Pages 189–220 in P. A. Sabatier, editor. *Theories of the policy process*. Westview Press, Boulder, Colorado, USA.

**Schlager, E.** 1999. A comparison of frameworks, theories, and models of policy processes. Pages 233–260 in P. A. Sabatier, editor. *Theories of the policy process*. Westview Press, Boulder, Colorado, USA.

**Schön, D., and M. Rein.** 1994. *Frame reflection*. Basic Books, New York, New York, USA.

**Schot, J. W., R. J. F. Hoogma, and B. Elzen.** 1994. Strategies for shifting technological systems: the case of the automobile system. *Futures* 26 (10):1060–1076.

**Skelcher, C.** 2000. Changing images of the State: overloaded, hollowed-out, congested. *Public Policy and Administration* 15(3):3–19.

**Smith, A., A. Stirling, and F. Berkhout.** 2005. The governance of sustainable socio-technical transitions. *Research Policy* 34(10):1491–1510.

**Stone, R.** 2008. China's environmental challenges. Three Gorges dam: into the unknown. *Science* 321 (5889):628–632.

**te Boekhorst, D. G. J., T. J. M. Smits, X. Yu, L. Li, G. Lei, and C. Zhang.** 2010. Implementing integrated river basin management in China. *Ecology and Society* 15(2): 23. [online] URL: <http://www.ecologyandsociety.org/vol15/iss2/art23/>.

**van der Brugge, R., J. Rotmans, and D. Loorbach.** 2005. The transition in Dutch water management. *Regional Environmental Change* 5 (4):164–176.

**van der Brugge, R., and R. van Raak.** 2007. Facing the adaptive management challenge: insights from transition management. *Ecology and Society* 12(2): 33. [online] URL: <http://www.ecologyandsociety.org/vol12/iss2/art33/>.

**Werners, S. E., P. Matczak, and Z. Flachner.** 2010. Individuals matter: exploring strategies of individuals to change the water policy for the Tisza River in Hungary. *Ecology and Society* 15(2): 24. [online] URL: <http://www.ecologyandsociety.org/vol15/iss2/art24/>.

**Wilder, M.** 2010. Political and economic apertures and the shifting state-citizen relationship: reforming Mexico's national water policy. *Ecology and Society* 15(2): 22. [online] URL: <http://www.ecologyandsociety.org/vol15/iss2/art22/>.

**World Commission on Dams.** 2000. *Dams and development*. Earthscan, London, UK.

**Young, O. R., F. Berkhout, G. C. Gallopin, M. A. Janssen, E. Ostrom, and S. van der Leeuw.** 2006. The globalization of socio-ecological systems: an agenda for scientific research. *Global Environmental Change* 16(3):304–316.