

Networks and Water Policy: Conclusions and Implications for Research

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In this concluding essay, the overall findings of this comparative project are analysed. The article turns to the general questions providing the focus for each of the cases. Some of the variations across the cases are explored. However, particular attention is paid to similar patterns in most or all of the investigations, since the set of cases is consistent with a diverse case design. The similarities include similar arrays of 'layered' water policy networks in several countries. The pure types of issue network or policy community, prominent in the network literature, are not found in the actual water policy patterns. Similar water policy network developments across most of the cases include trends toward more network openness, more emulation of business behaviour, and less domination by traditional professional groups such as engineering. Network dynamics can be explained in part by the welfare state crisis and the environmental challenge. The impact of network arrangements on policy formation and implementation is more difficult to document, but some evidence suggests linkages worthy of further exploration. The overall assessment is that network approaches can be helpful in policy research, but that understanding some of the limitations of the perspective and the requirements for better empirical theory are requisites for fulfilling this potential.

The six cases reported in the preceding pages present findings on the composition, development, and operations of water policy networks in several settings. The studies include reports on water policy and the complex structures through which it is formulated and executed, thus clarifying matters of policy substance and process for an important environmental issue.

Several of the articles also raise explicitly some conceptual and theoretical issues related to the application of network ideas to policy action. For instance, the article on the Dutch case offers a tentative theoretical proposal, with some evidence from the national setting, regarding how characteristics of policy networks may be related to policy instruments used in water and other policy sectors. The contribution on England and Wales offers several

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insights for scholars of policy – for instance, by pointing out that at crucial junctures key actors misperceived the composition of the network structure in which they were located, thus showing that even policy elites can make strategic errors in highly-networked contexts. And, to mention a further example, the article on the US pattern suggests that much of the extant scholarship on policy networks conflates several analytical dimensions in potentially confusing ways.

In this concluding article, we turn to the task of analysing the overall findings *across* the cases. This essay returns, therefore, to the initial questions posed in the opening selection and considers what has been learned about the broad issues raised there from the full set of empirical investigations.

The design of this comparative project should permit the development of some useful observations. The design might be termed a 'diverse case' approach. The instances under examination are not 'most different', in that all the nations included are at approximately the same level of development, and they face similar water problems: how to supply and dispose of an adequate amount of water at an acceptable standard (and an increasingly 'standardised' standard, particularly within the European Union, or EU) and for an acceptable price. But, as the initial contribution and the individual studies document, the cases are quite different on numerous other dimensions, including scale, specific water challenges, political alignments, and institutional-legal history. This variety permits certain inferences, as suggested below.

The set of studies is diverse not only in the sense that six different water policy settings are examined, but also in that the full assortment of studies reflects a considerable diversity of interests and approaches. Different contributors have brought a range of theoretical and substantive perspectives to bear.

This variety constitutes a strength of this combined effort, for at least two reasons. First, the diversity offers the possibility to build upon multiple strengths while also ensuring some degree of common purpose in the collective endeavour. Thus, the design of this project provides sufficient flexibility to allow identification of and reporting on interesting phenomena in each country (and at the level of the EU) that might otherwise be excluded in an application of a uniform case study protocol, while also assuring a certain common ground. And second, at this stage in the development of scholarship on the subject of policy networks, testable theories on the relations between network characteristics and their causes and effects are not yet clearly in place. Therefore, such a collaborative effort can generate promising ideas and insights for more systematic subsequent investigation.

To explore the conclusions and implications of this research effort, we proceed by organising points around the major questions identified in the opening essay. How can water policy networks in these settings be characterised?

How have they developed and what factors explain these dynamics? And how do the networks influence policy results? The following three sections of this contribution are devoted, respectively, to these issues. The fifth section of the study then provides an overall assessment of the utility and limitations of network perspectives as a way of understanding reality. The final part then points toward the kinds of additional investigations that would seem productive, given the results reported here.

Characterising Water Policy Networks

One important issue is how the networks examined in the six cases compare. The diverse case design means that, inevitably, many kinds of differences will be observable across the various cases. Some of these distinctions *are* important to discuss, particularly those related to the policy community-issue network dimension that was covered in the initial article. First, however, we turn to an examination of a different subject: not the obvious differences across the diverse cases but, instead, their similarities.

One strength of the diverse case design is that any correspondence observable across a collection of apparently-different instances points to a matter of likely interest. Here we focus on network characteristics. One correspondence across cases deserves special attention and is treated in the first subsection below. Some additional points are discussed in the second part of this section. Then distinctions that can be made across the countries, especially in terms of the issue network-policy community dimension, are examined. The section concludes with lessons for network characterisation and classification.

'Layered' Water Policy Networks

The most striking similarity across the national cases reported here, especially among the four nations not now in the midst of regime transformation, is that the water sectors are comprised of networked arrays that exhibit a degree of 'layering', an arrangement akin to concentric circles. In these several cases, researchers report relatively tightly-coupled clusters or 'cores', which operate interdependently with broader and more loosely-coupled structures. This parallel finding is evident, despite differences in the analytical language used in each article.

In some cases, the broader array has the appearance of a 'constellation': the actors are clearly interdependent but are dimly aware of the full picture and rarely deal directly with certain parts of the pattern. The US example clearly fits here, so much so that Heilman and colleagues make two points: there is *no* sectoral-wide network in United States water policy; and even sub-sectorally, the patterns consist of large numbers of loosely and sporadically linked participants: 'latent policy networks'. The arrangements in

England and Wales are different, according to Maloney and Richardson, but include 'sporadic interventionists' as well as the more regular and easily recognisable participants. The different layers, and more distanced but observable network patterns at some remove from the core, are also part of the depictions by researchers in Germany and the Netherlands.

The broader reaches of network arrays are documented, even if with some imprecision, in the foregoing essays. The more tightly-bound cores emerge more clearly from the analyses. The central portions of the national water networks are obviously influential in policy-making and execution. In addition, as the cases explain, the more peripheral network members also exert influence.

In the broadest sense, the cases document the point, raised in the contribution by Maloney and Richardson, that *contextual* and sometimes anticipatory effects of the broader network structure can be seen in the strategies and actions of those in the core (cf. Friedrich [1940] and Truman [1971]).

The sometimes-observable mutual and collective awareness on the part of the most central participants of the peripheral network elements is a feature of each case covered in this collection. This point does not mean that complex policy networks in the water sectors of these nations are easily adaptable and completely open. But it does suggest at least two forms of influence from the periphery, aside from sporadic direct involvement. First, the consciousness on the part of those in the core of the broader constellation can modify actions among the smaller set. And second, the broader network population – the pool of actors comprising the latent networks referred to in the depiction of the US case – not only arise on a temporary basis to alter the outcome on particular issues but also hold the potential to disturb the structure on a permanent or at least longer-term basis. The instances of the altered core composition in the Netherlands (to include the permanent involvement of important environmental actors) and the US (to introduce new professions like finance in water infrastructure development) illustrate this potential in action.

The water networks examined in this collection thus suggest a degree of stability and also – partially through the dynamics of peripheral involvement – the potential for adaptation.

Some further points of structural characterisation are of related interest. For instance, in several of the cases (clearly in the Dutch and German instances, apparently also in England and Wales) various segments of the water cycle are associated with identifiable sub-networks. (The US case also suggests a refinement, but of a somewhat different sort: in the American context, many water actors participate cross-sectorally in other patterns of networked interdependence.) And more generally, most cases contain various sub-sectoral networks even within a single phase of the water cycle. The

more detailed features of these sub-arrays vary considerably across national settings.

All in all, then, the water policy networks in these cases exhibit complexity and variety, but also a set of structural similarities that are of potential importance to those concerned with understanding the role of the networks in policy making and implementation.

Additional Network Similarities

A few additional similarities across the cases can be mentioned briefly. In each examination of the water policy networks, the researchers note the importance of professionals in network activity. In all cases, distinctive professional groups have been part of the core for some period. Furthermore, the dominant profession in each case, particularly in the past, has been engineers and related groups such as hydrologists.

It should not be surprising that this policy field, which until fairly recently was treated as a focus of public works and resource extraction, has been dominated by such actors. What may be more striking is a set of developments clearly observable in recent years in all the countries investigated here towards, first, the representation of a more diverse array of professional specialities in the national networks, particularly with regard to business and finance professions, and/or broadened orientations among extant network participants and, secondly, a more general opening up of network membership toward a greater range of actors.

With regard to the former trend, the incorporation – indeed, in selected instances the domination – by finance professionals has accompanied increased budgetary stringency and a shift in policy instruments towards more businesslike mechanisms for addressing water-related needs. This point can in turn be linked to the theme of welfare-state crisis raised in the introductory essay. The point is addressed more carefully below.

The trend towards increased openness, extending beyond a simple proliferation of professions in the water sector, has been particularly conspicuous with regard to the role of those representing environmental interests. It would be an exaggeration to suggest that a universal trend has placed environmentalists at the core of water policy in these countries. And more generally, many of the networks continue to exhibit barriers to participation. But the direction of change is clear. Emphasising the shifts raises the question of network dynamics, which is examined in a later section of this study.

The opening of the sector has extended beyond these groups and perspectives as well, as the European Union and to some extent the US cases make clear. In the emergent EU constellations toxicologists and eco-toxicologists play important roles in debates about parameters and possibly in the agenda-

setting process as well. In the US public health experts have appeared in some important water quality decision processes.

Beyond these points about network structure and membership, additional similarities can be identified among some of the cases. For instance, network features seem to be related to metapolicy characteristics, as mentioned at least in the US and England/Wales cases. Again, however, this issue of the relationship between network arrangement and causal forces is more appropriately discussed in the section on network development below.

Some Cross-Case Network Variations

The preceding subsections show that on some important structural issues, the cases exhibit similarities regarding network structure and membership. The cases do, however, differ. One of the most interesting dimensions of variation is the continuum between issue networks and policy community.

Despite similarities regarding layering, the network structures can be distinguished, with the interactor arrangements for groundwater at the level of the EU apparently at a pre-network stage. Similarly, in Hungary – examined as a representative case from central Europe – changed network structures as a result of the restructuring of society are only beginning to emerge.

Within the other national cases, considerable variation is apparent. The United States occupies perhaps the extreme point on the continuum. In the US, there is no sector-wide network – nor even an issue network – since portions of the sector do not relate even sporadically with each other. Rather, the US instance might be summarised as a set of arrays, most even more pliant than issue networks, with cores of varying composition significant but by no means dominant. In Germany too, the absence of sector-wide networks is notable, although the degree of structural integration appears somewhat greater than in the US case.

In England and Wales, shifts have restructured the interactor arrays. The former arrangements, consistent in most respects with the policy community concept referenced in the literature, have become less integrated, with the cosy pattern of earlier years having been displaced. Indeed, some of the most important actors in the network array are only now becoming aware of the shifts in their own structure of interdependence.

The Dutch case also documents transition, in particular shifts in network composition. And the depiction of sub-sectoral networks should serve as a caution that even in this instance, structural complexity is apparent. Nevertheless, the Dutch water policy networks exhibit more ties than do those in the other national settings. This point does not imply widespread agreement among the actors. Indeed, this case is one of several in which homogeneity has clearly declined in recent years.

With the 'seismic' shocks in the water sector in recent decades, and with

the significant openings visible in most of the cases, the classic picture of pure policy communities – sometimes almost a caricature in the literature – does not hold for any of these cases. Rather, some formerly-tight clusters of interdependence have largely given way to looser, somewhat more ephemeral arrays. Meanwhile, newer sectoral settings (the European level, the regimes undergoing transformation in Central Europe) confront the need to begin *developing* ties among actors who must take account of each other's interests and influence. And analyses of network dynamics (see below) suggest processes of both differentiation and integration underway in the different cases.

The networks studied for this project differ, as well, on a number of other structural dimensions. It is clear that both within national water sectors and also across the cases, the arrangements vary on such features as density, openness, dominance, and other characteristics considered in several of the contributions. Any generalisation about 'networks' for policy is likely to be questionable – even, as we have seen, the generalisation that there *are* always networks in operation.

Toward Theoretically-Explicit Treatments of Policy Networks

The foregoing suggests a few points of importance, then, regarding the most fruitful lines of conceptual development concerning the network concept. It seems apparent that policy networks are important structures in much of today's water policy decision-making. It seems likely, as well, that they are consequential in other sectors. Further, the most often-used dimension of network characterisation, the policy community-issue network range, can be used to array different cases. However, the pure types often referred in the literature do not correspond to today's policy settings, at least in the cases documented here. Certainly, simple dichotomies are not particularly useful in empirical terms.

The range and complexity of network arrays documented in these instances, particularly when coupled with the recognition of the many dimensions of network characteristics offered in the case studies, suggest that efforts to classify networks into simple compartments are not particularly helpful. Underlying dimensions suggesting a range of structural possibilities should be the focus of empirical scholarship.

Which dimensions? We have explored one with some care in this volume, primarily because of its ubiquity in the literature. Additional dimensions have been referenced as well. The most useful course of action for those interested in further exploration of the network idea is to recognise that there is no inherently good or bad classification of networks. Rather, the dimensions at the focus of analyses should be selected on the basis of broader theoretical considerations.

In particular, the network concept needs to be linked clearly to factors explaining the development of networks (that is, networks as dependent variable) and to theoretical ideas regarding the effects of networks, for instance on policy (networks as independent or intervening variable). The network project, in sum, needs to be part of a theoretical agenda. And the dimensions of interest regarding network characterisations need to be related explicitly to this theoretical ambition.

Accordingly, we turn now to some observations regarding the development and effects of water policy networks, respectively, as evidenced in this collection.

Network Developments

The water policy networks described above show both remarkable similarities and intriguing differences. In this section we attempt to analyse how this came about. What trends can be observed in the countries under study and what dynamics of change were associated with them? An overall conclusion is that fairly similar trends evolved in the four countries with established water policy networks (that is, leaving aside Hungary), patterns basically emanating from more or less the same challenges, but modified by diverse initial situations and a number of rather stable factors that influence both these circumstances and the ways in which new challenges have been incorporated into network operations.

Developments

As can be concluded from the contributions in this collection and the coverage in the section above, in the four countries studied water policy networks generally have become, first, more open; secondly, more businesslike – in the sense that certain organisations such as water authorities try to behave more like businesses; and thirdly, less dominated by an engineering orientation. These trends seem to be related to each other.

The British case study showed, for instance, that the institutionalisation of the more businesslike identity of the water sector, culminating in large-scale privatisation, brought the sector into the midst of the public debate, increased the range of organisations involved, and made the sector more vulnerable to external influences than at any time in its previous history. The environmentalists, especially, gained influence, simply by being out there. Dealing with these and other interests forces the network actors to give more attention to social interactions and processes in their strategic considerations, and less to their older, predominantly-engineering orientation.

The growing openness of the sector is apparent even in the US case, which was already permeable to begin with. New professions have been included.

Even on the sub-national level the relationships among the actors involved are sufficiently loose so that even the concept of issue networks suggests more coherence than can be observed. In this case, as well, the entrance of new professions into the patterns is related to more business-like water management. The shift is reflected, in other ways, by the emergence of privatised services. These new professions also bring new orientations, for instance an emphasis on economic efficiency.

In the Dutch case both the water supply companies and the water boards, central actors in two rather separate sub-networks, have declined sharply in number. This shift has been induced by the pressure for viable and efficient entities which could be managed as modern businesses. While water boards have always been more or less autonomous, indeed even guaranteed independence by the national constitution, the water supply companies have become significantly more autonomous. Nevertheless both water supply companies and water boards face an increasing need to respond to various kinds of external demands. This trend forces them to be more communicative, thus acting more on the basis of a social interaction orientation and less from an engineering perspective. To achieve their new goals they have to negotiate with actors from outside 'the water world', actors that to some degree become thereby part of it. Thus far, this form of openness has not really endangered the coherence of the network core. In the case of the Dutch water supply network signs are actually evident that the companies have come to accept more coordination through their association, as they face another well-organised community: agriculture.

In Germany the water networks, separate for various parts of the water cycle and in various Länder, have remained relatively stable. Although here too environmentalists have participated in discussions on a regular basis, it remains to be seen to what extent environmental interests manage to establish themselves as members of water policy networks. Furthermore, all over Germany new public, and sometimes private, organisations with large discretion and independent management are apportioned a share of water management tasks. Water supply utilities are dependent on the success of groundwater and surface water protection. The tension between groundwater protection interests and agriculture has not had as many consequences for the decline in dominance of engineering as in the Netherlands because in Germany water management already had often been included in environmental management agencies.

The European Union case also exhibits the phenomenon of expansion in types of participants involved in water policy, even though these constellations are still in the process of formation. The developing links with potentially large numbers of diverse actors are exemplified in the broad list of the DG XI General Consultative Forum.

Change Agents

Apart from their mutual interaction, the developments described above can be related to a number of factors. Among these are the historic and geographical settings in which network developments have occurred, the impact of federalism in the US and Germany, German and European unification, and the notable lack of political salience of this sector in earlier years. Many of these, however, are more or less stable features of national context and cannot be invoked to explain network changes (though they may affect the fashion in which these changes occur). Their influence is felt more on the *ex ante* situation and as intervening variables between the real causal forces or 'change agents', and network developments.

What then are these change agents? Two complex factors seem to lie at the heart of many of the observable lines of influence over network evolution. The first is the welfare state crisis, especially in its public finance pressures, and the second is the environmental challenge. Both have empirical and ideological dimensions, which vary across the countries in specific detail and intensity but have presented substantial meta-challenges in North America and Northwestern Europe during the 1980s and 1990s. Together they have had an unmistakable impact on the water sector: the time for 'pumping and billing' is over.

The welfare state crisis became manifest after the first and especially the second oil crisis, contributing to stagflation. The neo-conservative response of the Thatcher and Reagan administrations set the tone for the direction of policy response: more market, less government. In other countries such as the Netherlands and Germany, the ideological aspect of these policies was weaker. But less explicit, common-sense notions stemming from renewed confidence in the capabilities of private business spread in these countries as well. This shift resulted in the reorganisation of water tasks, and in some cases a reduction in financial support and an increase in expectations for more business-like management of public tasks – even to the extent of privatising the tasks in certain instances.

The environmental crisis emerged in two waves of public attention, one in the late 1960s and early 1970s, the other in the late 1980s and early 1990s. Though both these waves were triggered by 'epistemic communities' warning on the basis of scientific studies of imminent environmental decline, each also carried an ideological dimension. After each upsurge, public attention declined but stabilised at a higher level than before, in the process creating both new governmental and private organisations and bases of power for them. General environmental awareness rose, of course. And, in addition, some specific signs of environmental threats in the water sector increased the salience of the issues and added pressure for policy response. For instance,

surface water pollution in such places as the Rhine had killed water life and had often prevented the use of these waters for water supply purposes. Groundwater sources, as well, had showed increasing amounts of pollution which threatened to make them useless for drinking water production. The water sector inevitably had to deal with these problems, and the sectoral responses themselves caused new pressures. More generally, the tendency has been for other actors in other sectors, such as agriculture, to be drawn into water policy issues and thus render the networked context even more diffuse.

Central propositions in this section, then, are that the public finance challenge prompted, in particular, institutional and cultural developments promoting more business-like management; that the environmental and scientific challenges encouraged a social interaction-orientation; and that both factors directly and indirectly forced more openness in the water sectors of the several countries.

Variety

Similar developments stimulated by similar factors may present a misleading picture of uniformity, one that is valid on only a very general level. Closer inspection reveals considerable variety. The fashion in which the two fundamental factors just discussed have influenced developments in the four countries excluding Hungary is influenced by features characteristic of each country. For example: in the Netherlands and Germany many of the benefits possible from privatisation were attained instead by greater autonomy and shifts in management culture among organisations in the water sector. The same process was happening in the United Kingdom, but other factors pushed the institutionalisation of autonomy further – to full privatisation – without there being a deliberate government policy toward this end. The British government became trapped in its own ideology. Though a four-case-study design is unlikely to demonstrate definitively the impact of these kinds of influences in a comparative fashion, some expected influences can be plausibly related to the observed differences in developments across the cases.

The highly legalistic culture of German policy-making, for instance, seems to have affected the nature of the actors involved (note the inclusion of law experts) and the kind of relationships among actors within the network (relatively inflexible). In fact, the changes in openness and orientation within the German water sector seem somewhat less significant than in the other countries covered in this collection.

So it is important to consider the significant differences in the *ex ante* situations across these four countries. In the preceding contributions, these initial conditions are related to similar kinds of variables, factors that both

help to determine the *ex ante* circumstances and also modify more directly the relationship between the main agents of change reviewed earlier and the network developments of interest. Factors such as natural or geophysical differences, plus scale and degree of federalism, shape antecedent circumstances and newer developments alike.

Not all such factors with a general impact create variety. Two that do not can be mentioned for purposes of the discussion below. The first of these is water itself, which actually flows through its own natural cycle, thereby suggesting and stimulating an 'undercurrent' of interest in more coordination in the sector. Left to their own devices, the technical specialists of the sector in each of these countries would integrate their efforts through the cycle's phases. Thus factors promoting fragmentation never have an easy or permanent victory. Second, to a significant extent the water sector operates specific technologies of its own. These encourage the sense that water engineers as a professional group are both distinct from other professional groups and able to harmonise water management throughout the developed world. The existence of such a tightly-knit and technically-specialised professional community has made it possible for the sector to be regarded as an apolitical, management-focused cluster, during certain periods at least – although the evidence from the EU is that newly-forming arrays in the current period are likely to display more diverse characteristics even in the early stages.

One of the factors that does cause variation across the settings is the degree of natural diversity present, especially in combination with each country's history. The United States is home to almost every imaginable water circumstance. National uniformity cannot be a practicable aim under such conditions. Moreover, water policies present virtually no 'core politics' for the federal level. Against this background, water policy issues have often been used in package deals to accommodate regional interests, often interests focused primarily on other issues. These separate bargains tended to stimulate fragmentation even further. As an additional background feature, the country's political culture views any division of authority as such in favourable terms. The theme is even anchored in the constitution. So the tension between repeated efforts to increase coordination (the undercurrent of water policy), on the one hand, and the factors reinforcing fragmentation, on the other, are as present in the US case as in the others. The balance between the two, however, falls more on the side of diversity in this instance than in the other countries. The debate on subsidiarity within the EU echoes this theme, of course, with talk of repatriation of some water laws and of greater flexibility for the member states.

There is a further factor which creates some variation between the United States and the three Western European countries: the evolving European Union. To some extent it might be considered a change agent itself, because

the impact, even interference, of European regulation with water policies of the member states is on the rise. The EU influence on the development of the water networks in these countries, however, seems more indirect and variegated. In Germany the reactions of the Länder to European regulation differ from that of the federal government. This range of response has the effect of rendering the European dimension visible in German water politics. In the United Kingdom institutional developments have made the European regulatory issue much more visible. Here, as well, the European dimension became highly visible as a consequence. In the Netherlands, on the contrary, European regulation is completely included without much debate into national policies and standards. Its visibility as an exogenous factor is therefore low during everyday elaboration into regional policies and implementation, and its influence on the structure of the network is not distinguishable from that of internal policy developments. Finally, and outside the current EU membership, nations such as Hungary are being influenced by European regulation as water networks develop and policies take hold; and such countries will, somehow, have to accommodate their policies and policy processes to the developing patterns as described in the European Union review.

The initial situations in the various countries also seem to have had some influence on the ways in which the prime change agents have influenced network developments. Network stability depends not only on the degree to which the structures adapt to new challenges, but also on the extent to which these emergent issues become integrated into the professional expertise and attitudes of those in the network. In all countries examined here, as well as in the EU, environmental considerations have become more prominent than ever. The manner in which this has occurred, however, has varied. In some nations' networks, environmental values were incorporated into the existing organisations; in others new organisations, with environmental issues as their prime focus, were added to the network. Access for new environmental organisations was not easy in any of the instances. In England and Wales their influence seems to stem primarily from others' taking them into account as a relevant outside force. In the Netherlands and Germany, the two most intact policy communities of the sample, environmental values seem to have been internalised to a larger extent by existing network organisations which have identified themselves with these new tasks. In the US both patterns are visible across the differentiated network 'waterscape', although the principal method has been the inclusion of new actors representing heretofore excluded or under-represented interests. The suggestion here is that the initial degree of network coherence reproduced itself in the ways in which environmental perspectives have been incorporated.

Even in the Dutch case more openness can be observed, but this shift has

an impact mostly as a means to include new fields of expertise. The most typical pattern is one in which others are invited to participate in forums of the more established network participants. With considerably less frequency do the newer participants come alongside the older network, thus challenging it from the outside. This pattern is plausibly related to the fact that the Dutch networks to begin with are far less fragmented than the US ones.

Networks at Work

The cases presented in this collection offer considerable information regarding the characterisation of water policy networks in the several settings, and they also provide rich and somewhat complementary explanations for the development and evolution of these networks over time, as the preceding two sections of this essay explain. The cases, however, contain considerably less information on the third research question at the focus of this comparative investigation: how have the networks had impacts on the formation or implementation of policy, or both? On this theme, networks as independent or intervening variables in policy and implementation processes, the researchers report some, but limited, evidence.

Particular points on this score, developed as parts of the individual investigations reported in this collection, are mentioned below. Yet the fact that the discussion of the issue is relatively limited in this set of studies – and also in the broader literature on policy networks – raises questions of importance. Does this point suggest that the usefulness of the network concept, at least as a potential explanatory tool, is itself limited?

Three possibilities can be mentioned. It may be, first, that the notion requires careful incorporation into a theory and set of testable hypotheses before clear evidence can be gathered and assessed. An instance of how this task might be undertaken is presented in the Dutch case in this collection. A related point, secondly, is that it seems likely that measurement problems impose limitations on what can be documented and tested regarding networks as causal entities. This is a theme developed in particular in the US paper. Third, of course, it may be that, despite their near-ubiquity and the level of interest they have generated among scholars of policy, networks actually turn out to have relatively little impact on policy. This last possibility seems least likely.

Furthermore, it seems particularly appropriate that scholars of policy are devoting attention now to increasing the clarity of the network notion, since in western Europe as well network discussions are likely to increase in frequency as the European Union continues to seek influence over national actors in the water sector, as elsewhere. As Richardson documents, there currently are no clearly-discernible network-like arrays involving the EU in

regular patterns of interaction with national decision-makers. However, the goal of the EU is policy (and implementation) change. As these efforts develop and intensify, should they be conceptualised as shifts engendered by exogenous forces, or as a set of altered network constellations resulting in (endogenous) policy consequences? Clearly, in at least some of the relevant countries, national actors and their heretofore-autonomous water sectors are coming under the influence of a different (and very messy) policy-making arena in Brussels. A question for policy researchers is whether to see these impacts as the products of network dynamics, or to conclude that the network notion itself is limited in such cases by failing to account for exogenous but significant impacts.

The studies in this collection do offer some evidence on the importance of networks for policy results. The cases imply, furthermore, additional questions and hypotheses on the subject. These deserve additional, more sustained follow-up in later research. Three articles here citing evidence of networks as causal forces are worth brief mention in this regard: the Dutch case arguing that network features may be related to certain policy characteristics; the US findings on the impact of network composition on the State Revolving Loan programme and implications regarding network effects; and the indication in the England/Wales case of contextual impacts on the actions of core policy-makers.

The Dutch case certainly does not constitute ironclad proof that networks determine policy instruments in patterned and predictable ways. Nevertheless, the evidence is suggestive and largely consistent with the theoretical propositions developed in more detail in Bressers [1993b]. It may be possible, then, to substantiate systematic relationships between broad network features and some kinds of policy results, even if difficult measurement problems are entailed in documenting the intervening behavioural or cognitive dynamics. In a related vein, the findings here suggest broad support for the themes of Sabatier and Jenkins-Smith in their model of policy change based on belief systems: the clusters of activists (Sabatier and Jenkins-Smith deal with advocacy coalitions and policy learning in several sectors) may have both short-term and long-term impacts on policy, including the instruments adopted by those involved [*Sabatier and Jenkins-Smith, 1993*].

The US case points to some limitations involved in demonstrating clear and measurable network impacts, but it also offers evidence regarding the relationship between a shift in network composition (towards involvement of private for-profit actors in wastewater infrastructure financing and development) and policy choices made (funding less environmentally pressing but also less financially risky projects).

Beyond this specific relationship, the US study suggests a broader – and thus far unanswered – question about the link between networks and policy

change. The US water policy example represents, as the authors suggest, an extreme pluralistic case, at least among the countries in this collection. In documenting the lack of coordination characteristic of the US case, the analysis is reminiscent of arguments developed in other studies of pluralism: that high fragmentation facilitates only incremental changes. The coverage of the US water policy setting makes it clear that important policy changes have taken place over relatively brief periods, thus suggesting that the *degree* of change and the likelihood of *coordinated* change are different dimensions. This point implies, as well, the need for clarity and differentiation in the specification of dependent variables in network investigations.

What is more, the US case serves as a reminder that conventional ideas of pluralistic policy-making, which emphasise the difficulties of large-scale change, clash with some of the scholarship on policy networks, which proposes that more integrated structures of interdependence are likely to be more resistant to change (see, for instance, Rhodes and March [1992: 197-98]). Both views challenge the null hypothesis that there is no relationship between network features, on the one hand, and policy results, on the other; but they do so in different ways. It may be possible to render the two theoretical arguments consistent, provided that they be made more specific and perhaps narrower in focus.

The Dutch case also suggests the importance of specifying and distinguishing among the possible dependent variables influenced by network arrangements, in noting for wastewater pollution policy that the relationship between network complexity and implementation success is not necessarily negative (cf. Goggin *et al.* [1990]).

The findings for the case of England and Wales are suggestive in another fashion on the question of networks as causal forces. For the impact of increasing openness in policy settings, at least as documented in this instance, appears not only as reflected in the participation of more actors but also in the degree of influence that *ad hoc* participants can achieve, especially in the agenda-setting phase. As indicated above, the evidence suggests that the more sporadic participants can have important contextual effects on policy processes and contents even when there is no direct and observable interaction.

One additional theme may be mentioned usefully in this review of networks at work: networks in the implementation process. As the introduction to this collection indicated, structures of interdependence have clearly been recognised as a topic of potential importance by scholars studying implementation in numerous policy sectors. The point is emphasised in these studies of water policy networks as well. The Dutch findings on this subject have already been discussed. Similarly, but necessarily in a more speculative fashion, Hanf and Roijen point to the likely importance of network develop-

ment in Central and Eastern Europe if the daunting water problems of that region are to be managed effectively.

A further, more general, theoretical issue is suggested by these analyses. It is worth considering, on the basis of the findings in these cases, how much openness can be expected in networks for implementation when compared with those for policy formation. The layered network concept, above, implies that when network cores for policy formation have characteristics similar to those associated with policy communities, the implementation network is likely to be more open and complex as core clusters of actors find they must deal with other interests during execution. The Dutch case illustrates this possibility. An opposing line of reasoning, however, would suggest that during the implementation phase the turbulence of policy-making is replaced by the more stable and technical activities of execution, with the full-timers and technocrats in control. In general, then, implementation networks in many cases could be expected to be somewhat narrower and closed, in practice, than the patterns of interdependence associated with the more visible phases of public decision (see O'Toole, Hanf and Hupe [*forthcoming*] for a general argument). In the water policy cases, this pattern might be visible in some of the European cases, at least until some actors complain to the EU and thus enlarge the pattern for strategic reasons. Note, in this regard, the possibility raised in the article by Maloney and Richardson that with some of the European developments currently underway, the distinction between formation and implementation networks might virtually disappear.

In short, when one examines how and whether networks for formation and implementation might differ according to the challenges with which they are faced, some intriguing possibilities emerge. This collection is more helpful in identifying these than in documenting clear patterns across the cases.

Overall, then, this set of studies documents limitations regarding what can be concluded clearly about networks as influences on policy. But evidence of impact is indeed available, and – perhaps more interestingly – the analyses serve as fruitful sources of ideas and preliminary hypotheses. A number of these ideas can be pursued in future investigations, although the limitations on conceptualisation and measurement noted above must also be borne in mind.

Networks as a Way of Understanding Reality

The preceding analysis has documented several fashions in which a network approach can be useful for the comparative examination of water policy. In most of these respects, a network perspective can also be expected to offer considerable potential in other sectors of policy, provided that it is used carefully and in accord with the lessons and limitations suggested from this set of

studies. The general approach clearly offers promise. It is useful here, accordingly, to develop further some of the more cautionary notes that should be kept in mind by empirical researchers and theorists who seek to build on the possibilities sketched above, as the network notion has been applied to the water policy sector.

Network thinking tends to stress the issues at stake as the product of a negotiated reality. In such a view there is little room for external, direct central governmental intervention. Nevertheless, some such instances are visible in the cases examined here. In Germany the Emscher Co-operative Association and the Ruhr Association were formed by statute, thereby forcing all relevant actors to be members of a new organisation and thus compelling them to manage their own affairs without any direct state involvement in the operation. Although this action was taken at the beginning of this century, it is a form of network management that could be regarded as modern if applied today. It shows, however, not only the importance of networks, but also, in a sense, the opposite: that networks in some cases are themselves primarily a tool of government.

This example from an earlier period might not be very convincing evidence that such a possibility could be anticipated under present circumstances. But other, more recent instances can be found among the cases. For example, some crucial stages of the recent privatisation process in the United Kingdom were described by Maloney and Richardson as representing an opportunity to resort to an impositional policy style in which the policy community and the policy network as a whole were excluded by government. (Consider, as well, the instance of DG XI and its efforts to 'structure relationships' among non-governmental actors to 'make the process of consultation more effective *and manageable*' (emphasis added), as discussed in the contribution on the EU.) What is relevant here is that a network concept of reality seems to be not invariably helpful. Indeed, to some extent it can also disguise the fact that in at least some instances networking is not an inevitable course of action for modern government, but a choice. Descriptions of reality as being overwhelmingly networked might even become to some extent self-fulfilling in such cases. Therefore, again, careful attention to both the merits and the limits of network analysis seems appropriate.

Network analysis also faces some limitations in that it enlightens much but not all of the policy action that is of interest to scholars. Furthermore, alternative explanations can often be described in network terms or used independently. The impact of the Dutch effluent charge system – as the main financial institution of Dutch surface water quality management – on the processes of building treatment plants and negotiating cleaner industrial waste water can be described in network terms, but the relationships could be explained with alternative conceptual and theoretical approaches. The con-

tinuing subsidisation of water treatment in the US and Germany has a substantial impact on policy implementation. But is network analysis really needed to understand it?

More generally, network analysis as well as other approaches used in policy studies are characterised to some extent by an accent on both a real-world object of investigation (a 'locus') and also a certain perspective, in principle, on policy (a 'focus'; cf. Bressers [1993a: 203]). Thus, for instance, a policy-instruments approach would stress instruments and their characteristics as both objects of inquiry and also as a certain orientation to the policy process and its determinants. Conceived as perspectives, various approaches such as institutional analysis, network analysis, process analysis, resource analysis, and others, can produce complementary insights that may be usefully integrated. This synthesis is an essential step so that familiar insights are not simply rediscovered in other terms in a nearly endless fashion. The key question, then, is what have we learned by the end of the day? Only old wine in new bottles?

When the approach as partial object and the approach as perspective are mixed together, the integration runs the risk of using simultaneously concepts drawn from different approaches which relate in an unclear fashion. Therefore it is very important that the links between these concepts are further clarified so that analysts can be better able to assess the added value of network concepts for understanding public policy. There has been a tendency in scholarly explanations to use the network concept to refer not only to actors (that is, networks as a reworking of actors) but also with respect to institutions (constellations of rules) and processes, occasionally even with respect to characteristics of policy. A solid integration and clarification must inevitably restrict and tighten the use of the network concept in analytical terms.

Another difficulty can arise in efforts to use the network concept systematically in comparative investigations. There might be some disjunction between the scale of the subject (such as time-span, process, region, country) and the degree of coherence of the network related to that subject. Perhaps networks can be used as a meso-level concept. Although there is some evidence to the contrary, one could imagine that the lesser degree of integration of the water policy networks in the US compared with, for instance, the Netherlands could be a function of the size of the subject (in this case, countries) rather than a product of the difference in the way water matters are dealt with in the two countries. Trying to find 'the' water policy network of the European Union might pose similar, or even worse, problems. This problem of scale increases the importance of a very clear definition of the variables that are under study. Without such clarity, the temptation is to put different phenomena into similarly labelled boxes, because of similar

functions being performed in the larger and smaller countries. Conclusions drawn from such comparisons might then easily be misleading. All in all, the usual methodological requisites of well-defined variables, explicit expectations, and precise measurements are certainly no less important in an application of a network approach. Again, then, a lesson to be stressed from the present set of investigations is the importance of designing empirical studies not around a general idea of networks, but by incorporating some underlying dimensions or variables of network types which are both measurable and plausibly related to causes or effects. The formulation and use of theories that are both empirically and logically based and cast light on the relationships between these variables and their causes and effects are of the utmost importance. Otherwise, network researchers risk getting stuck with vague insights that prove useful only as a preliminary eye-opener rather than as a crucial stage in the development of empirical network theory.

Concluding Perspective

The contributions to this collection have a broad common theme, beyond the substantive focus on water policy; it is that the concept of networks for the study of environmental politics is indeed promising (cf. Glasbergen [1989]), but that it also remains at this point a rather vague notion with many underlying dimensions. Separate case studies run the risk of using network analysis only as a language. Comparative analysis reveals that that is not enough to understand the causes and effects of network dynamics. It is not the adoption of the concept of networks *per se*, but more specifically the use of the various characteristics that networks can have that enables researchers to increase understanding of the relationships between these causes and effects. Though hardly surprising as such, this conclusion has not often informed the efforts of those who undertake comparative empirical studies. This symposium can be seen as a modest effort to do just that. Much careful comparative empirical analysis still has to be done, and should be guided by increasingly tight theoretical frameworks. The products of such analyses can be expected to enrich the theories in return.

The choice of the subject of water policies for this comparative effort has also been of considerable importance, from the perspective of the contributors to this symposium. In the past for the developed world, and also nowadays in developing countries, improving the availability and quality of water has probably been the single most important factor for increasing human life expectancy (see World Bank, [1992: 99]). Nevertheless, in today's Europe, and in North America as well, significant threats to an uninterrupted supply of high quality water have been identified [Commission EC, 1992: 19-24]. Water policy issues have gradually become recognised as an important com-

ponent of the effort for sustainable development. On the other hand water policy *in toto* might be too broad a subject for an in-depth analysis of the relationships between network developments and policy processes. Therefore, as a next step in the develop of network analysis toward the end of understanding such policy developments, the research group represented in this volume has begun to pursue a new project on cross-sectoral connections: a systematic comparative analysis of water-agriculture linkages in several countries and the EU.

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