Networks as Models of Analysis: Water Policy in Comparative Perspective

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Network models for analysing public policy have become widely used in recent years. This symposium assesses the network idea by applying a common perspective on network analysis to the constellations involved in water policy formation and implementation in several countries and the European Union. Water policy is an important and increasingly salient subject, and the networks involved in the sector have altered recently in important fashions. Thus the topic is suitable for investigations of network dynamics and their impacts. In this article, some of the most significant lines of contribution to network research are reviewed, and the network concept is clarified. Preliminary assessments of the utility and limitations of network analysis are presented. In particular, it is argued that the network emphasis offers some analytical advantages in understanding policy processes. Network characteristics and some dimensions of network variability are sketched. Particular attention is paid to the dimension for which policy communities and issue networks constitute polar cases. A rationale for the comparative analysis of water policy networks across different settings is presented.

Introduction

Over a 20 year period and on both sides of the Atlantic, political scientists, policy specialists, and sociologists have been developing and refining network-based models of policy making and policy implementation. Literatures have emerged on issue networks, triple alliances and pluralistic structures, public-private cooperative arrangements, policy communities, and other similarly-labelled entities.

Indeed, the profusion of terminology has sometimes confused more than it has clarified. There have been many reformulations and redefinitions.

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Numerous case studies have used variations of the network concept in a heuristic, sometimes even vaguely metaphorical way. (These cases have usually been sectoral – that is, within one substantively-specific field of policy – and mostly at the national rather than the comparative cross-national level.) At a minimum, however, network analysis has enabled scholars to order a mass of empirical material in a useful way and in a fashion which is often readily recognised by the actors under study. And it has prompted theoretical speculation regarding intriguing social-scientific questions.

This symposium is intended to contribute to the assessment of the network concept after two decades of usage. Has the application and development of network analysis gone beyond its intellectual shelf life? Or can an appropriately-formulated network perspective advance further our understanding of important policy issues? To answer these questions it is essential to identify the most important features in the literature on network analysis, especially as developed in political science and public administration. Just what, if anything, is being claimed when it is argued that policy networks exist and play an influential role in the policy process? What *can* be claimed?

This collection is also designed to contribute to an understanding of the policy dynamics in a particular field – water – that is now closely linked to, though certainly not synonymous with, the environmental policy sector. To what extent can water policy be explained by the use of network analysis?

Furthermore, through this compilation and most explicitly in the concluding article, we strive to facilitate the *comparative* analysis of water policy. While some other studies have pointed to questions of network variation (see, for instance, Marsh and Rhodes [1992]), the present set develops and documents the range and types of variation as part of a carefully-coordinated joint effort.¹ All settings analysed herein face generally the same basic water policy goals – primarily, to dispose of waste safely into the hydrological system and to provide pure water in sufficient quantities for both domestic and industrial uses. Clearly, the hydrological and demand conditions vary considerably both within and between nations, and this variety could be expected to produce quite different policy outcomes. What is less clear is whether policy outcomes are also affected, and if so, to what degree, by the range and nature of participation in the policy process and by different configurations of actor relationships.

In this regard, water policy constitutes a particularly interesting subject for investigation. For the starting point of our analysis is an assumption that water policy (or at least some aspects thereof) has, for several reasons, been subject to significant pressures in recent years by forces both technical and political. The results in some settings have been, first, a proliferation of actors in a field known hitherto for its rather low salience and technical character and secondly, shifts in the structures of their interdependence. Water policy

appears to be an intriguing example of the difficulties of managing a multi-actor policy environment in which new players have introduced both new values and behavioural norms, and in which altering network patterns may have shifted the *loci* of influence and the ability of *any* actors to effect the outcomes they desire. How such altered circumstances might themselves influence policy results is a consequential albeit intricate question.

In this introductory contribution, we set the stage for the succeeding network investigations and their comparative analysis by addressing several issues. In the following section the discussion offers a review of some of the more important tributaries to the stream of literature on networks and policy and elaborate on the network concept. The summary shows that the network notion has been increasingly prominent in scholarship on both policy-making and policy execution. It also suggests that the theme refers to a cluster of somewhat different ideas. Therefore we stipulate how the network concept is used in the set of studies comprising this symposium, especially with regard to the question of which kind of actors makes up networks: persons or organisations.

Then we offer some preliminary assessments of the utility and limitations of network analysis. In this section we present two lines of argument. The first is that the world itself is increasingly networked. The second is that the network emphasis offers some analytical advantages when one is trying to understand policy processes.

Networks can vary greatly in a number of respects and those variations can be expected to matter for policy results. So researchers need to get beyond the general network metaphor and tackle the more complex issues of network characteristics – along with their causes and consequences. This is done in the fourth section of this article. The conceptual differences and some of their theoretical implications are illustrated more specifically through treatment of one important dimension of reported network differences: that of intra-network exchange- and norm-based integration. This is the dimension alluded to in the literature on policy communities and issue networks for policy formulation. The coverage here also provides an appropriate backdrop for investigating the theme of policy development and change. Aside from this dimension some other network characteristics are mentioned.

In the fifth section we suggest a rationale for the comparative analysis of water policy networks across different settings, and in so doing provide context for the six cases being treated in this collection. We also offer some brief comments on the selection of the cases and the comparative methodology. The concluding section of the collection offers a short preview of the rest of the symposium.

The Network Concept

Governments have long had to deal with numerous actors in the course of seeking to develop and implement public policy. Effective public problem solving in late welfare states, it is clear, requires the cooperative efforts of numerous individuals and institutions: public, private, and third sector (not-for-profit). Often, no organisation of government possesses sufficient authority, resources, and knowledge to effect the enactment and achievement of policy intentions. Instead, policies require the concerted efforts of multiple actors, all possessing significant capabilities but each dependent on multiple others to solidify policy intention and convert it into action. Indeed, it is often difficult for any one actor, or group of actors, to manage, or manipulate, the flow of problems and solutions onto the political agenda in the first place. Thus, there are complex multi-actor processes for both the identification, definition and resolution of policy problems, and for the implementation of policy.

Social theorists have come to place great emphasis on the cross-institutional, networked features of large-scale social action. We recognise three fields of social science that share this emphasis and have in turn contributed to what could be labelled a network concept: first, interorganisational theory; secondly, classic and more recent descriptions of 'iron triangles' as 'real life' phenomena; and thirdly intergovernmental relations. In the paragraphs below we touch lightly on these fields.

First, the field of interorganisational theory or interorganisational relations has burgeoned during the last generation (see for instance the multiple reviews in Nystrom and Starbuck [1981, *esp. pp.* 383–530]). Even formal social theorists, using such diverse modelling strategies as mathematically-based social exchange theory [Coleman, 1986] and game theory [Weissing and Ostrom, 1993], have sought to ground the investigation of complex, networked interdependence in robust and rigorous approaches. Beyond the distinction between formal and more inductive perspectives, important theoretical differences continue to separate the approaches taken, most especially between power dependence and exchange theories; and sociologists still struggle with basic issues of conceptualisation and measurement (see Cook *et al.* [1983]). But interorganisational studies have become a fertile subject of scholarship.

Secondly, in the study of government more directly, real-life network arrangements have been objects of systematic scholarly attention for some time, albeit under varying terminology and conceptualisation. The classic American notion of the triple alliance or iron triangle – the symbiotic relationship among administrative unit, legislative oversight committee, and supportive interest group – had been developed extensively in the 1960s and

even before [Freeman, 1965]. Later critiques of this portrait of networked policy-making and execution – like Heclo's very different conceptualisation [1978], see the discussion later in this article as well as in others in this collection) – stimulated important revisions in the theoretical discussion. However, respected analysts, including those based in the United States, continue to give the tight and mutually supportive pattern of interaction its place in empirical accounts [Lowi, 1979; Wilson, 1989].

Thirdly, especially in the complex relations among governments within the same national system, the field of intergovernmental relations has seen considerable attention in recent years. While the complexities of interdependence in federal systems have received special attention (for instance Beam, Conlan, and Walker [1983], in the United States; Scharpf, Reissert, and Schnabel [1976], for Germany), unitary states have not been exempt from this scholarly trend (see Friend, Power, and Yewlett [1974] for an early British instance; and Toonen [1987, 1990] and several selections in Hufen and Ringeling [1990] for coverage of the Netherlands). Indeed, recent government cutbacks in subsidies and intergovernmental transfers have only increased the investigations of mandating, privatisation, and networked indirect influence (see Kettl [1993]). The emergence of the European Union (EU) has provided further impetus (see for instance Scharpf [1988; 1994]).

Recent studies of these phenomena echo, in turn, scholarly investigations – dating at least since the 1970s – of the welfare states' crisis, the challenges of implementation, and the problems of governmental steering in complicated systems of interdependence. The theme of welfare state crisis – a portfolio of challenges to *all* policy sectors, one tied to serious expenditure constraints and apparent limits on state capacity to set policy goals and achieve them, so as to satisfy the demands and expectations of the populace – has been a central motif both of the scholarly left since the 1970s (see Offe [1984] for instance) and also of neoconservative social thought. In some of its most influential versions, the argument is tied directly to the issues of social interdependence and the complications of government – or any institution – seeking to control or direct concerted action when such action is crucially reliant on the concerted efforts of many. These theoretical efforts serve as background for the empiric-theoretical effort in this collection.²

For present purposes, we employ the term *policy network* to denote the large class of multi-actor arrangements of interdependence in these varied phases of the policy process. Following the notions employed by Jordan [1990] and others, we use the concept of policy network in a generic sense to encompass the variety of structures of interdependence identified, sometimes only vaguely, in the burgeoning scholarship. In the fourth section we introduce further differentiation among network types.

Treating the network concept as a generic referent for multi-actor struc-

tures of interdependence raises the further question: who are the actors in policy networks? In particular, are networks comprised of individual persons or organisations? This issue touches upon longstanding debates in social science. The next two paragraphs clarify how the composition of policy networks is considered for purposes of this symposium.

As proposed by the criteria of methodological individualism, we treat persons rather than organisations as basic actors. In their actions, persons represent their organisation(s) and also themselves (or their perspectives and interests). These influences may point in different directions, of course. Still, when one examines a policy network, one observes behavioural patterns among the individuals; and the organisations are only visible via the form in which they are represented by and through the individual actors.

Nevertheless, most network participants are present because of their organisations' interests in the issues at stake, and the behaviour of the individuals within networks is likely to be shaped heavily by the institutional arrangements that drive the perspective of the actors and the composition of the network. 'Miles's Law', as it is sometimes called, is operative: where one stands depends on where one sits. Thus it is inappropriate to exclude organisations and organisational identities from the picture; indeed, they help to drive policy processes and results. Accordingly, for shorthand and emphasis we typically follow the convention of referring to network actors in terms of (or as representatives of) their organisations. These refinements clarify but do not negate the basic perspective of persons as the actors in network processes. Indeed, in some cases in the water policy sector, individual persons, like academics, become involved primarily because of the knowledge they possess rather than the organisations with which they are affiliated.

The Utility and Limitations of Network Analysis

Why and how do networks matter? In this section we present two lines of argument. The first is that the world itself is increasingly networked. The second is that the network emphasis offers some analytical advantages when trying to understand policy processes.

For the reasons sketched earlier in this article, network structures are increasingly important in substantive terms, and an adequate understanding of policy action (and inaction) in many nations requires a recognition of the causal impact of these multiunit structures. Differentiation, states this argument, has dispersed problem-solving capacity (involving knowledge, power, and financial resources) across sets of actors whose cooperative efforts are nonetheless needed for policy success – that is, problem solving on issues of mutual interest (see, for instance, Hanf and Scharpf [1978]; Hanf and O'Toole [1992]). The social and political as well as technological features of

policy context thus create, even guarantee, the development of conditions for highly complex and interdependent decision-making; the result is the challenge of joint action and its implications. In some parts of the policy process, for instance formulation efforts, the emergence of networks has been stimulated primarily by the *political* functions served through interdependent action. For policy implementation, the explanation can be extended to include technical requisites: functional differentiation vitiates straightforward coordination and integration and creates challenges to collective action; thus, it follows, the enhanced importance of network arrangements as integrative structures for practical policy action [Hanf, 1978; Mandell, 1992; O'Toole, 1988]. This functional differentiation includes not only various governmental and semi-governmental agencies but also active participation by members of target groups and their representatives in implementation structures [Bressers and Klok, 1988]. Some researchers and theorists point to both developments (for example, Scharpf, 1978).

In the investigation of environmental politics and policy a consideration of the network theme is particularly relevant. In many developed nations, the unanticipated consequences of complex patterns of interdependence have resulted – through the emergence of environmental movements, policies, and institutions – in efforts to reorient and restructure extant patterns of action on behalf of previously-neglected values. Furthermore, the flaws evident in many early approaches to environmental issues – for instance, the lack of due consideration given to cross-media transfers of pollutants (still typical in the US structure for environmental issues at national and subnational levels) – have added a further impetus to networking and coordination across institutional niches: interorganisationally within governments, intergovernmentally within and across nations (note the emergence of important environmental regulation at the level of the EU and even now in a very limited way via the North American Free Trade Agreement), and between public and private spheres. In some nations, notably the Netherlands, policy now stipulates that the comprehensive and systemic character of the environmental issues requires in turn comprehensive approaches and institutional arrangements for policy and its execution: a networked environment, in short, necessitates a networked approach. The developing cross-sectoral links thus pose challenges to the stability of sectoral and sub-sectoral structures and may, indeed, signal eventual shifts in the scale of networked arrays: towards many more actors tied across broader policy spaces.

The foregoing discussion documents that there are plausible if not compelling reasons to expect networked patterns of interaction to matter in contemporary policy activities. The question can now be asked: do network-based examinations of policy activities produce any added value, beyond what scholars are likely to garner through other, and perhaps more traditional,

approaches to social theorising and empirical observation? For even if networks exist, it is nevertheless not obvious that approaching the analysis of policy settings via a network *perspective* – with the concept of networks a prominent one in characterisation and explanation – provides better or more thoroughgoing explanations and predictions.

The demonstration of the proposition is dependent on testing through systematic research. This symposium marks one effort to see if the network idea offers a contribution – and perhaps more interestingly, what the limitations of such a contribution are likely to be. In this initial discussion, some preliminary thoughts can be offered regarding both the utility and limitations of network analyses.

In a sense, the utility of network approaches has been suggested in the foregoing coverage, at least by implication. For the apparent ubiquity of network-based discussion and theorising has not been driven primarily by some mindless fashion among social scientists, but rather from the inadequacies of alternative perspectives. As Hjern and Porter observed with regard to the investigation of policy implementation, the ‘lonely organisation syndrome’ – the set of approaches neglectful of the networked features of the implementation context – had restricted insight, limited predictive power, and even generated weak and counterproductive practical recommendations [Hjern and Porter, 1982]. In the study of both policy implementation (see Sabatier [1986]) and also policy formation [Kingdon, 1984], the increase in attention to networks has itself derived from the need to incorporate the network insight systematically into analysis.

A few additional and somewhat more specific points can be made about the advantages (and also limitations) of focusing on networks in policy. A network perspective in policy research is further justified by reviewing several observations about settings for policy research. Most modern approaches conceptualise policy formulation and implementation as multi-actor interaction processes, the course and results of which can only be understood from characteristics like the goals, information and power of the set of actors involved. A network perspective is also consistent with this conceptualisation, but these features alone do not mark this perspective as distinctive. Rather, a set of additional observations comes into focus once one adopts a network approach.

A first observation from a network perspective is that the actors involved in the policy subject interact not only during the research period, but also before and after. The interactions under observation in any policy research, therefore, are influenced by the history and predicted future of these intersections.

A second and related observation is that the actors often interact not only in the processes under study but also in other fields as well. Acknowledging

that the process under investigation is not the only venue for interaction among those under study, even during the period under investigation, means that the analyst is better able to understand some of the activities and interactions in the process under study that, almost inevitably, are inducted by experiences in our expectations of other processes of interdependence (for an elaboration of these two observations in an implementation setting, see Arentsen and Bressers [1991]).

A third observation from a network perspective is that the actors involved in the process under study not only act on their own or in reaction to each other, they are also influenced by background actors who play no direct role in the observable interaction but are connected through a network. One can expect to find that some organisations in a policy network nearly always remain in a background position, but these can be important when they are a source of indirect influence upon others (for an interesting example in transport policy – the role of consumers – see Dudley [1994]). One obvious role could be as trusted or authoritative advisers. Another, more subtle channel of influence by background actors occurs when those in the core of overt decision-making respond in advance to the expected positions and pressures of certain others in the broader array, as suggested in a different context by Friedrich's 'law of anticipated reaction' [1940].

Finally, and again relatedly, this point about indirect influence can be broadened. An advantage of a network perspective is that it can be used to direct attention to the larger structure of interdependence. Instead of assuming that influence takes place only through direct and observable interactions, whether as personal relationships or among representatives of institutional interests, a network approach – applied at portions of a policy process as varied as formulation and implementation – can investigate how the larger structure can have systematic effects on the behaviour of individual actors as well as on the content of decisions, policy responses, and implementation efforts. A network approach thus offers the chance to combine both interpersonal and structural explanations for policy-relevant events.

In total, these observations explain why the course and product of a policy process can seem to have a rationale different from what might be expected from the immediately-observable interactions of a set of separate actors. Accordingly, then, one could expect a network perspective to provide insights helpful in the analysis of policy.

Of course, one must be cautious. To confirm the existence of networks of some kind may say no more than that there *are* networks! The network perspective can lead to an overemphasis on the who compared with the what. The activities and interactions within the network then tend to be viewed as one giant garbage can, largely immune to careful analysis. In the extreme form, all processes under scrutiny merge into one, which seems to process

and produce nothing, but only reproduces itself. The analyst might then conclude, incorrectly, that this perspective constitutes the state of the world, while in fact it may be an artifact of one's failure to make clear distinctions among the various processes being examined. Furthermore, the degree of involvement, and the goals, information and power of the network actors often vary considerably from one process to another. Whenever this circumstance obtains, it is useful to analyse these processes separately, albeit not in isolation from the others in which the network actors are also engaged. We are conscious, therefore, that network analysis has both advantages and limitations.

Network Characteristics

A very general formulation of the policy networks notion is helpful as a starting point but means little in terms of explanation and prediction. For such purposes, a characterisation of the systemic, patterned network arrangement – and its causes and hypothesised consequences – is necessary. Among policy researchers focusing on processes of policy formulation, in particular, some efforts have been made to develop characterisations in terms of the degree of exchange-based and normative integration observable within the network.

For instance, Richardson and Jordan, writing of British policy making in the late 1970s and attempting to de-emphasise the traditional political science accent on formal institutions, made use of the term *policy community* [1979]. It was meant to convey a very close and stable relationship between policy actors, akin to the dictionary definition of community – ‘joint ownership of goods, identity of character, fellowship (. . . of interest)’ [*Oxford Dictionary*]. This formulation was in turn prompted by Heclo and Wildavsky's study of the spending community in Whitehall, which they likened to village life [1974; 1981].

Use of the community notion carries with it, therefore, some reasonably explicit notions of appropriate *levels of analysis*: if policy actors are brought together in a long-term and stable relationship which presents the prospect of both significant normative agreement (perhaps manifested through the folkways of the community-like pattern) and relatively smooth exchange ties, then this type of pattern is likely only at the sub-sectoral or even micro level.

Jordan emphasises both the *stability* of policy communities and the existence of *shared views*. Such an arrangement, he argues, ‘has advantages in encouraging bargaining in policy resolution’ [Jordan, 1990: 327]. The explicit hypothesis (or sometimes assumption) of stability of relations and of actor participation (almost exclusiveness) is also evident in more recent work incorporating the concept of policy community. Thus, as Judge points out, Rhodes repeatedly states that ‘policy communities are networks characterised

by 'stability of relationships, continuity of a highly restrictive membership, vertical interdependence based upon shared delivery responsibilities and insulation from other networks and invariably from the general public (including Parliament)' (quoted by Judge [1993: 122]; see, for instance, Rhodes [1985: 15]; Rhodes and Marsh [1992: 182]).

This usage is more restrictive than earlier formulations in that it seems to emphasise insularity almost as an overriding feature and thus appears to reject the notion that new members might be admitted and absorbed relatively easily. Also, it implies great, nearly exclusive, emphasis on a shared *community of views*, suggesting that policy communities do not exhibit much conflict. The formulation neglects exchange as a potential binding force and thus may underestimate the potential for policy communities to remain vital and coherent despite quite serious disputes and despite having to admit new members. Further, these definitions also significantly underestimate the linkages between different policy communities, now a very common feature of the policy process in some national settings (see, for instance, Jordan and Richardson, [1982: 89–90] for evidence on the British case).

This particular shift in emphasis in Britain – from a world of policy-making rather dominated by policy community politics to a more loosely organised and therefore less predictable policy process – was also reflected, somewhat earlier, in the US (see Campbell [1989]). Indeed the seminal work (on either side of the Atlantic) is still Heclo's US-focused analysis which began to re-direct attention towards policy *dynamics* – the impact of network arrangements on shifts in policy processes and results. Just as many writers were identifying stable policy communities, Heclo had observed a trend: policy decisions often escape the confined and exclusive 'worlds' of professionals and are resolved in a much looser configuration (if indeed such a structured term can be used) of participants in the policy process. 'Professionals' here refers to those with advanced training, preference and capacity for self-governance (thus limited access by outsiders), and specialised knowledge within the sphere in question. Heclo argued that the nature of power in Washington had begun to change – politics was less 'clubbable' because more and more groups had entered the policy process [Heclo 1978: 94]. Thus 'as proliferating groups have claimed a stake and clamoured for a place in the policy process, they have helped diffuse the focus of political and administrative leadership' [Heclo 1978: 94–5]. Existing conceptions were not well suited to the loose-jointed play of influence that was emerging.

In a now classic formulation, he argued that

Obviously questions of power are still important. But for a host of policy initiatives undertaken in the last twenty years it is all but

impossible to identify clearly who the dominant actors are. Who is controlling those actions that go to make up our national policy on abortions, or on income redistribution, or consumer protection, or energy? Looking for the few who are powerful, we tend to overlook the many whose webs of influence provoke and guide the exercise of power. These webs, or what I will call 'issue networks', are particularly relevant to the highly intricate and confusing welfare policies that have been undertaken in recent years [1978: 102].

Even Heclo, however, was reluctant to accept a thesis of total disorder. He added significant qualifications to the model of diffuse power and lack of accountability. He pointed out a paradox (which will be considered again in the concluding article in this collection) of disorder *and* order when he argued that a second tendency could also be distinguished in issue network settings, one cutting in the opposite direction to widening group participation. In the midst of the emergence of the loose issue networks he could also identify what he called 'policy as intramural activity'. He points to 'the development of specialised subcultures composed of highly knowledgeable policy-watchers' with a 'detailed understanding of specialised issues that comes from sustained attention to a given policy debate' [1978: 49].

He deftly linked the two apparently contradictory trends by noting that

Whatever the participants' motivation, it is the issue network that ties together what would otherwise be the contradictory tendencies of, on the one hand, more widespread organisational participation in public policy and, on the other, more narrow technocratic specialisation in complex modern policies [1978: 103–104].

Can sense be made of these contrasting images of networked arrangements and their impacts in the policy process? The suggestion by Rhodes and Marsh that policy communities and issue networks are part of a continuum, indeed anchor its poles – and that policy networks should be used as the generic term — is a useful reminder that more than one kind of multiactor arrangement may be present and thus more than one model of policy making may be applicable in networked settings.¹

This continuum, one based on tightness of coupling (through both exchange relations and normative ties) and perhaps also on a shared familiarity with the subject matter, is of considerable interest. The preceding paragraphs make clear that the theme has been exceedingly prominent in scholarship on networks for policy-making, that it bears on theories of policy development and change, and that it cannot be simplified merely into distinctions among networks based on national systems of policy (for instance, British networks as communities and the American variant as issue

networks). Although considerably more research is required on the topic of this dimension of network characteristics, therefore, the questions raised by it are of sufficient interest and importance that they receive attention in the current collection. Each of the studies that follow offers some observations regarding how the water policy networks in the context in question can be placed on this dimension. (Several of the cases also characterise the networks on additional dimensions.)

Each deals with the link between this dimension of network structure and policy dynamics as well. Placing networks on this continuum enables us to focus on the possibility of observing *changes* over time in the relevant network characteristics – the nature and range of participation as well as the structure of participants' interdependence – and determining whether these are related to patterns of alteration in the associated water policy processes (and perhaps outputs and outcomes). Further, it may be that at any given time *several* types of networks are in operation. If so, the interrelationships (if any) between these require examination.

The continuum is also helpful in analysing different *stages* of the policy process, particularly formulation and implementation. On the relationship with the policy formulation stage it can be hypothesised that the initial characteristics of the network will tend to reproduce themselves by means of the choice of goals and policy instruments [Bressers, 1993]. In tightly-coupled networks, policy instruments will tend to be selected so as to strengthen the networks' coherence. This hypothesis is explored further in the Dutch contribution to this volume.

As suggested earlier, policy ultimately requires delivery or implementation. The requisite actors have to be mobilised and co-ordinated. Research on the implementation task has often emphasised the network features of the implementation context (see, for instance, O'Toole and Montjoy [1984]; O'Toole [1986]; Hanf and O'Toole [1992]). However, relatively little attention has been devoted to how more successful mobilisation and more concerted co-ordination may be achieved (for early efforts, see O'Toole [1988]; Mandell [1992]; O'Toole, Hupe and Hanf [1994]). And virtually no examination has been attempted of the relationship between the challenge of successfully managing the implementation process in networked contexts, on the one hand, and the placement of network type on the dimension under discussion in this section, on the other.

It might seem that, *ceteris paribus*, more successful implementation management in networks is related to tighter, more community-like network characteristics among those required to cooperate in the execution effort. However, a more complex hypothesis might be offered by distinguishing among dependent variables. Community-like implementation networks may be expected to be associated with smoother execution processes during the

implementation phase. However, they may not necessarily be related to more successful outcomes. Building and maintaining communities for implementation may require some restriction of access, which in turn can hinder overall achievement by excluding some necessary participants from the coordinated effort. (For coverage of some of the complexities of plausible implementation hypotheses in multi-actor (network) contexts see O'Toole [1989]; Goggin, Bowman, Lester and O'Toole [1990].)

Nevertheless, despite the obvious importance of the community-issue network dimension for implementation processes (and results), thus far these two bodies of scholarship – that on the network dimension under discussion here and that on the requisites for implementation success – have developed in almost complete isolation. While this symposium is not the place for a full synthesis of the two, the contributions do provide some opportunity to consider possible links between these separate network literatures.

A comparative symposium on networks for water policy may be particularly propitious for such an inaugural effort. It can be argued that well-integrated implementation arrangements may be especially crucial in policy areas – like water and associated infrastructure – which involve complex *physical* networks, sometimes operated by multiple professions. Where the physical system is interdependent, we might likewise expect actor interdependencies to be quite marked. This circumstance raises the possibility of a model of policy-making which both emphasises the fluidity of issue networks – perhaps even more fluid than Heclo's original formulation which still envisaged a 'shared knowledge group' [Heclo, 1978: 103] – and also emphasises the importance of rather specialised and technical 'policy communities' in the model suggested in some of the literature reviewed earlier.

In the discussion so far we have focused on a set of characteristics that is helpful in placing various networks on a continuum. But of course these are not the only characteristics that can be expected to matter for policy results. There is no shortage of network dimensions of potential interest to scholars of policy. If researchers were to try to consider them all, empirical designs would face a degrees-of-freedom problem, since the number of dimensions would rival the number of networked settings that could reasonably be subjected to careful examination. Among those that have been suggested as potentially important for systematic investigation are: number and type of network participants; degree of stability or institutionalisation; level of formalisation; degree of complexity; type of interdependence (for example, Thompson's distinction among pooled, sequential, and reciprocal patterns [1967]); degree of overlap; extent of centralisation or concentration; degrees of dominance, accessibility or openness, and coordination; type or scope of issue or coverage; as well as phase of phases of policy for which the network is engaged. Other plausible possibilities could be mentioned. (For treatments

of some putatively important dimensions of policy networks see Jordan and Schubert [1992]; Pappi, Knoke, and Bisson [1993]; Parks [1985]; van Waarden [1992].)

It is clear that previous empirical research has been unable to clarify this bewildering array of network features. As but one collection comparing networks in the single field of water policy, this volume cannot hope to provide a definitive classification of network characteristics. In the concluding essay, however, we seek to make a modest contribution to the characterisation of networks in more analytically-meaningful terms. Accordingly, our approach contains two components.

First, the research reported in the next several articles has been conducted by investigators who have coordinated with each other in several respects, not least in considering collectively which network dimensions seem most significant in each case as well as collectively. Consequently, although none of the investigations offers a complete characterisation of the policy networks studied, each treats relevant dimensions.

Second, to ensure some consistency across the studies and to offer a small step forward in developing meaningful network distinctions, *all* of the investigations report on *one* potentially-important network dimension, that indicating extent of exchange- and norm-based integration within the network in question. This is the network feature implicitly referenced in the literature on policy communities and issue networks discussed in this section.

Comparing Networks for Water Policy

This volume offers a contribution to the study of policy networks by developing comparative characterisations of a set of such arrangements within an important common policy sector – water – across several nations and at the level of the European Union.

Studying the water policy sector is useful for a number of reasons. Handling public functions related to water involves some of the oldest responsibilities of government. Indeed, in some nations, such as the Netherlands, water management tasks have been handled for centuries by water boards (*Waterschappen*) whose existence predated the state. Furthermore, better technical knowledge and the increased salience of environmental issues in recent years mean that water policy has acquired renewed importance. Investigations in this field also provide opportunities to conduct policy research in a context of dramatic policy and institutional change. In this sector and among the settings scrutinised in this set of studies, these dynamics include: experiments in privatisation, the challenges of unification (in Germany) in a field where institutional-technological incompatibilities render coordinated change especially problematic, tightened and

increasingly complex regulatory standards, and the emergence of the EU as a supranational policy actor – or network of actors. Accordingly, the study of networks in the water policy sector deserves special attention.

The varying types of turbulence referred to above mean that network structures and relationships are not necessarily stable over time. They can be subject to both endogenous and exogenous change, reflecting shifting conditions (for water networks, these include hydrogeological, financial and legal circumstances), values, and participation in the various stages of the policy process. These ‘disturbances’ can be expected to be especially noticeable in situations where scientific and technical knowledge emerges in the context of growing political salience. (There is also the possibility that new knowledge will itself *raise* political salience, of course.)

In the case of water policy, a number of factors appear to be at work which have led and may continue to lead to disturbances of established patterns of behaviour in the relevant networks. For example, water supply shortages in certain regions, tightened regulatory standards on waste disposal and clean water systems for both domestic and industrial use, severe resource constraints, and much greater knowledge of the intra- and international effects of pollution – both to wildlife and humans – all have suggested that existing policy arrangements may need to change quite radically. In addition, water policy has become caught up in broader questions of environmentalism, thus raising the political salience of aspects of the policy area enormously. In some of the countries under study here the matter is even more complex because of broader currents of political and ideological change, plus what we might call (following Dror [1968]) ‘metapolicy’: policies and framing assumptions about policies. One such additional influence is the push for privatisation experienced in several nations; this impetus too can present a seismic shock to sectoral politics. Thus, in the British case, as documented in the article by Maloney and Richardson, the policy sector has been subject to major stress for all of these reasons – with yet further complications because of Britain’s membership in the EU. In the German case, as Rüdig and Kraemer show, the impetus to privatise has been weaker, but the policy dynamics are complicated in a different fashion by the severe pressures attendant to political unification. In Hungary, of course, political upheaval has combined with intergovernmental differentiation and large-scale privatisation to create massive changes in the water field, as well as in many others.

In almost all of the countries under study, the researchers whose work is included in this symposium examine what – decades ago – used to be a rather quiet, well managed and consensual policy process but which has become much more salient in political terms; is facing considerable financial pressures; and is experiencing pressure from new actors (for example, environmentalists, consumers) who have begun to demand access and

influence (the US case is somewhat more complicated, as is clear in the detailed study included in this collection).

In some cases the agenda setting process may have 'escaped' the traditional confines of the sector or sub-sector, and observers may be witnessing the defensive response of traditionally-powerful actors to agendas set elsewhere. However, at some point governments – local, regional, national, or even supranational – must seek resolution of conflicting objectives, differing values and diverging demands. At its most basic, wastewater must continue to be disposed of and usable water supplied. Some collective means must be found for devising solutions which are acceptable (in the sense that key actors acquiesce to the policies and relevant implementers cooperate in executing them) and which will actually work. Shifts in network membership and structure, which are consequences of the kinds of disturbances sketched above, are therefore likely as a means of dealing with these functional-technical and political pressures. Changed systems of interdependence with altered memberships are likely to see shifts in shared assumptions; new patterns of alliance and conflict; transformed vocabularies, core values, and perceptions (see Sabatier and Jenkins-Smith, [1993]). All these modifications, it can be hypothesised, can have independent effects on policy and implementation processes and on policy results (compare the treatment of the influence of the policy community-issue network dimension in the discussion above).

In the field of water policy, there can be no doubt that policy and implementation processes have taken on new characteristics in numerous national settings during recent years. And it is even more obvious that during the same period policy results – in terms of both outputs and also outcomes – have changed greatly in most developed settings. As policy researchers know all too well, nevertheless, it is much more difficult to attribute causality in these complex processes. For all their differences, theories of policy processes built on the notion of networks as a central concept either assert or assume that the networks *per se* make a difference in what happens. Whether and how they do in actual empirical instances is a most difficult but extremely important set of questions for scholars of public policy. These are questions that the individual country investigations included in this collection address and try to answer. And the issue is considered again in the concluding article of the symposium.

This collection includes analyses of water policy networks in six settings: Germany, Hungary, the Netherlands, the United Kingdom, the United States, and the European Union. This last instance adds another level of analysis and also helps to place most of the single-country European instances into context and systematic comparison. Comparing policy networks in this way offers particular advantages. Until recently, cross-national comparisons of policy

networks have been rarities. However, such investigations may be necessary to advance the study of such networks (see Schneider [1987]; Hanf and O'Toole [1992]).

The selection of cases comprising this collection has been based on settings which, as a group, encompass sufficient diversity so as to allow an approximation to a most different case comparative design. An investigation of the EU networks themselves was deemed warranted on the basis of the increasing importance of the European level in water policy matters specifically, and environmental policy generally. While all the national settings included in the symposium face roughly similar water challenges, their hydrogeological conditions and institutional arrangements – including the financial and legal factors mentioned earlier – are sufficiently varied so as to allow an investigation of quite diverse contexts. An advantage of such a comparative design is its potential to identify important cross-case similarities. That is, if in very different kinds of cases water policy networks exhibit similar characteristics, or if their features seem to be shaped in similar ways, or if they demonstrate parallel impacts on policy process or results, such findings may be strikingly suggestive. Indeed, such cross-case correspondences can be identified in the cases treated in this collection, and some general patterns are examined in the concluding article in the symposium.

While each researcher or team of investigators was free to employ the methods that seemed most appropriate to the conditions and constraints prevailing in the given setting, all cases reported here derive from extensive examination of the relevant literature produced earlier in each context, plus review of reports developed by governments and other groups, and especially – interviews with many of the participants in the networks under investigation. More precise details of method are provided in each article.

Overall, this contribution to the comparative study of water networks focuses on several research questions, all derived directly from the perspective advanced above. Consequently, the first question is descriptive. The second treats networks as a dependent variable. The third involves networks as an independent variable. The research questions that emerge on this basis are the following:

How can the networks involved in water policy be characterised?

The *foci* of this question are the network properties identified earlier. In each investigation conducted as a part of this coordinated effort, some coverage of both water supply and water quality has been attempted; furthermore, each has treated – at least to some extent – not only policy formulation but also implementation. Each investigation thus reflects an effort to cover the water front, as it were, within the context in question (nation or EU). Individual investigations in several cases emphasise one or more of these topics (for

instance implementation, or policy formulation for water quality); in each case, such skewing of the presentation is based on the scholars' judgment as to the network issues of special importance for the case in question. Each contribution in this symposium identifies the principal actors in the network(s), and the network setting as a whole is characterised. In each case, the network setting is described in terms of the policy community-issue network dimension discussed earlier; additional network features are also included in the characterisations in several of the articles.

What are the dynamics of change in the network or networks?

How have the networks under investigation assumed the character they now have? Are they now in rapid flux, or static? Why? This coverage necessitates some inclusion of historically-relevant information. The scope of longitudinal coverage has been left flexible so that the authors can select the most appropriate range in terms of what best helps to explain the current and recent characteristics of the network(s) and their dynamics of change.

What is the importance of the water policy network(s) to the nature of the policy process, outputs and (if it is possible to say) outcomes in the case in question?

Can features of the policy network(s) being examined help to explain how policy gets made or implemented, or why water policy has the features it has, or why it has changed in particular ways? If possible, the investigators are asked to offer at least tentative answers as to why knowing about the policy network(s) may provide information of some import for policy making and its execution.

Prospect

The network characterisations developed in this volume identify a number of findings of interest and raise issues of theoretical consequence. The research demonstrates, for instance, that a policy community – a particularly well-integrated arrangement – has operated at the core of the British networks for water policy formulation and also implementation. However, this core has been set aside, at times, and now has to operate in the context of a much broader and more open *mélange* of actors. In the United States, by contrast, the network structure had long been more variable and diffuse. Here too, however, signs of further broadening are now evident. In the EU and in Hungary, to take two additional instances, the participants themselves may, at present, find difficulty in predicting the ultimate structures of their interdependence, which they are in the midst of crafting. In each of these cases, and others covered as well, elements of policy network composition and

structure can be related, at least tentatively, to some attributes of policy process. As it turns out, nonetheless, the ability of scholars to develop clear evidence regarding the attributes and importance of this link between network structure and policy results is bounded in some important ways, which are themselves a subject of analysis in the concluding essay of this collection.

Further, the detailed analyses of this collection demonstrate the impact of multiple factors on characteristics of policy networks. Through coordinated network investigations, including an explicitly-comparative concluding chapter, the studies show the range of variation observable across the set of networks.

The overall product, we believe, offers a contribution to both the comparative study of policy networks and also the operations of one important and dynamic field of modern policy with substantial implications for the environment.

NOTES

1. Thanks are due to the Council for European Studies, the Anglo-German Foundation, and two host universities (Twente in Enschede and Erasmus in Rotterdam, The Netherlands) for support enabling the group and editorial meetings resulting in the coordination of these parallel studies. The editors also acknowledge the helpful comments by the other contributors to this symposium to earlier versions of this introductory article. The responsibility for any errors of fact or interpretation in this article, nevertheless, rests with the authors.

The research is the product of an ongoing cross-national comparative water policy-network study among researchers located in the nations under investigation. Following an initial planning meeting, the researchers convened several times during 1992–1993 to coordinate analyses. Earlier research from this project is reported in Bressers and O'Toole (1992).

2. For instance, the work of Scharpf and colleagues has highlighted the networked character of social action deriving from technical-functional and political imperatives in late welfare states [1977; 1978; 1993]; (see the discussion later in this article). And the efforts of Luhmann and other theorists (see Luhmann [1990]; Teubner [1993]), while quite different and arguably more pessimistic, carry intriguing implications for how policy might be made and executed in networked systems characterised by autopoiesis, or self-referentiality. What kinds of guidance can policy makers and implementors provide, what kinds of steering may be possible, if direct chains of control or even influence are inherently unmanageable and unpredictable? Such important questions, while beyond the direct focus of this symposium, provide clear evidence of the broader theoretical and practical issues that frame and fuel the study of networks in political and social action.
3. They draw on Benson's 1982 definition of a network as 'a cluster or complex of organisations connected to each other by resource dependencies and distinguished from other clusters or complexes by breaks in the structure of resource dependencies' [Benson, 1982: 148]. However, they go on to distinguish five types of networks '... ranging along a continuum from highly integrated policy communities to loosely integrated issue networks'. [Marsh and Rhodes, 1992: 13].

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