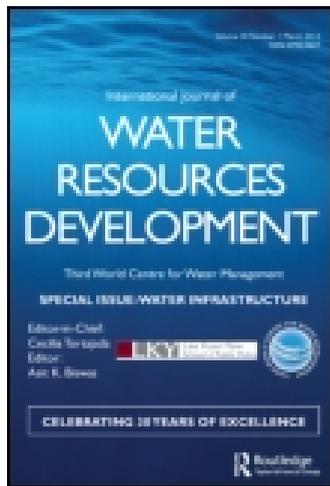


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IWRM in England: bridging the gap between top-down and bottom-up implementation

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Implementation of IWRM has generally been approached mechanistically, with attention focused on identifying necessary conditions and developing useful tools and techniques. In contrast, this article examines alternative approaches to implementation in their totality, using IWRM in England as a case analysis. In England, the EU Water Framework Directive has been implemented through a ‘top-down’ approach but a ‘bottom-up’ approach has been adopted for catchment management. Both the Water Framework Directive and the catchment-based approach are consistent with the goals of IWRM, but their implementation arrangements are disconnected and operate at different scales. This example suggests that cross-scale interplay and bridging institutions are critical to the successful implementation of IWRM in complex governance settings.

Keywords: England; IWRM; EU Water Framework Directive; catchment-based approach; governance; institutional frameworks

Introduction

Integrated water resources management (IWRM) has been in use around the world in various guises for at least 70 years, but came to global attention following the International Conference on Water and the Environment in Dublin and the Earth Summit in Rio de Janeiro in 1992 (Mitchell, 2005). Following these events, IWRM gained credence and in an effort to promote understanding and adoption, the Global Water Partnership (2001, p. 1) proposed the following definition:

IWRM is a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

Since then, IWRM has received widespread support from governments, international donors, development and resource management agencies, environmental NGOs and many other kinds of organizations and groups with interests in water. It is not difficult to appreciate why this has been the case – IWRM has been presented and promoted by some of its advocates as a “nirvana concept” (Molle, 2008) that offers all societies the prospect of a much better future in which water is used and managed efficiently, effectively, equitably and sustainably. Few people, if any, involved in the management of water would choose to argue that this is not an important and worthy aspiration. However, IWRM has been subject to some intense debate and strong criticism (Biswas, 2004, 2008). Attention has been given to the political, institutional and organizational obstacles which can slow or even prevent attempts to integrate the management of water and other resources (Blanco,

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2008; Blomquist & Schlager, 2005; Falkenmark, Gottschalk, Lundqvist, & Wouters, 2004; García, 2008; Jaspers, 2003; Jeffrey & Gearey, 2006; Mitchell, 1990; Watson, Mitchell, & Mulamootil, 1996). According to Butterworth, Warner, Moriarty, Smits, and Bachelor (2010, p. 70):

IWRM reforms and implementation have been costly and time-consuming while the benefits are yet to be seen. This is not what only critical writings of scholars say as some multilateral institutions feel the same way. Maybe we have been expecting too much, too soon.

Overall, one of the greatest challenges is establishing whether sufficient progress is being made along the most appropriate paths, given that the ultimate goals of IWRM are so broad and in many cases are still in the far distance. Thus, many of the major concerns and questions regarding IWRM are related to implementation. For clarity, 'implementation' is interpreted here to mean a process in which decisions are made and actions performed to put commitments or statements of intent into effect. Generally, implementation of IWRM has been viewed from a mechanistic perspective and approached through the development of 'best practices' which are assumed to be universally applicable. This kind of approach is exemplified by the *Handbook for Integrated Water Resources Management in Basins* jointly produced by the Global Water Partnership and International Network of Basin Organisations (2009) and the Global Water Partnership's (2013) IWRM Toolbox. Consequently, fundamental questions regarding how implementation should be approached strategically, given that IWRM is being applied in extremely varied natural, economic, political, institutional and social contexts, have been largely overlooked.

However, there is an extensive literature on the implementation of public policy which is extremely helpful for comprehending, analyzing and responding more effectively to the implementation challenges of IWRM. This article presents a synopsis of the policy implementation literature and considers how such knowledge and insights can be used to improve the effectiveness of IWRM, using England as a case analysis. In doing so, the intention is not to offer a particular remedy for implementation gaps and failures which can affect IWRM, but to encourage scholars, policy makers and practitioners to think more broadly about the design of implementation strategies for different contexts and environments.

Because of moves towards devolved government in the UK during the last decade, this article deals exclusively with the situation in England. Initially, attention is focused on the literature pertaining to policy implementation, to highlight important developments, models and insights which are relevant to IWRM. Next, the article turns to the relationship between the implementation of two key initiatives in England: the EU Water Framework Directive (WFD) (European Commission, 2012) and the catchment-based approach (CaBA) (Department for the Environment, Food and Rural Affairs, 2013). Both of these initiatives promote coordinated management of land and water, protection of ecosystem health and the provision of multiple economic, social and environmental benefits and, as such, include many of the principles and objectives associated with IWRM. Proposals to bridge the gap between the implementation of the WFD and CaBA in England are outlined as part of the analysis. Finally, general conclusions regarding IWRM implementation are presented and the implications for the development of implementation strategies in different institutional settings are discussed. The article is based on the author's own research in addition to experiences and insights gained whilst acting as an advisor to the consultants who evaluated the development of CaBA on behalf of the national government and provided a learning programme for the hosts of some of the catchment management groups.

Policy implementation

Most commentators agree that, since the pioneering work of Pressman and Wildavsky (1973), policy implementation research has evolved in three phases (Goggin, Bowman, Lester, & O'Toole, 1990). In the first phase, attention focused on case studies designed to reveal how single, authoritative, government decisions were carried out. Early research findings indicated that outcomes were influenced by factors such as clarity of goals, available resources, size of the target area or population, allocation of tasks and specification of performance standards, management control and commitment, measurement of implementer performance, and sanctions to promote compliance and accountability (Elmore, 1978; Mazmanian & Sabatier, 1981).

In the second phase, research attention moved towards the development of analytical frameworks to describe, explain and improve policy implementation. Two very different perspectives and associated schools of thought emerged, based on contrasting top-down and bottom-up models, that can be used descriptively, analytically and prescriptively (Sabatier, 1986).

In the top-down model, implementation is described as a policy-centred and rational process that begins with an authoritative decision by senior policy officials. Next, the decision is progressed downwards through relevant organizations and departments in a sequence of increasingly specific steps that define the original policy intent or expectation. Thus, implementation is based on strong bureaucratic management involving clarity, control, coercion and compliance so that actions taken throughout the process correspond with the policy objectives. Analytically, the top-down model can be used to identify and explain similarities or deviations between the idealized and real-world practices of implementation (Van Gossum, Ledene, Arts, De Vreese, & Verheyen, 2008). Viewed from the top-down perspective, implementation failure results from vague and ambiguous goals, which cause confusion, misunderstandings and disputes; plus unclear lines of responsibility and weak accountability, which may allow deviation from the stated objectives; and finally resistance or poor performance from implementers. To avoid such problems, a programmed approach to policy implementation is prescribed whereby policy makers provide clear objectives, control behaviour, monitor compliance, and coerce implementers using incentives and penalties. However, top-level policy makers typically operate at a distance from implementation environments and there is a danger that they will insist that actions be taken which are inappropriate for conditions and problems on the ground.

In the bottom-up model, implementation is described as a process in which policy is created by street-level bureaucrats using their knowledge of problems as they are experienced on the ground, and their interactions with other actors and affected groups (Lipsky, 1980). In this approach, implementers are much more closely involved in defining the issues and problems to be addressed and in formulating policy responses. Thus, policies come to fruition through a joint process of formulation and implementation involving networks and coalitions, individual skills, local and experiential knowledge, and learning through experimentation and creativity. Analytical research based on the bottom-up model focuses on relations among actors and the implementation strategies created by them in response to particular policy choices. From the bottom-up perspective, over-specification or lack of agreement regarding goals; exclusion of affected groups from the policy design process; and too much control and direction over implementers are considered the main causes of implementation failure. The bottom-up school of thought prescribes an adaptive approach to implementation that provides intentionally vague or ambiguous goals, opportunities for active participation, and discretion for implementers to

create or modify policies to fit field-level conditions. However, local implementers may not have the authority, motivation, incentives or sanctions needed to instigate necessary changes in behaviour. Furthermore, bottom-up implementation networks and coalitions may lack democratic credentials and accountability, and discretion may be used to avoid change or protect vested interests. Consequently, this approach to implementation may also create risks of producing ineffective, inefficient or inequitable outcomes.

The top-down and bottom-up approaches are clearly different in almost every respect, but when applied appropriately to different situations, either may lead to successful policy implementation. Berman (1980) suggested that programmed implementation is most appropriate for structured situations, characterized by the need for incremental changes, certainty, low conflict, strong collaborative links, and stability. In contrast, adaptive policy implementation is more likely to succeed in unstructured situations (Table 1).

In a third (and ongoing) research phase, attention has focused on the changing nature of governance itself and the increasing role of intergovernmental relationships and multi-party networks in implementation processes (O'Toole, 2000). As such, alternative accounts and explanations have been put forward which seek to integrate elements of the top-down and bottom-up approaches (Matland, 1995). Viewed from this governance perspective, policy implementation is a more complex political process in which organizations and groups interact and negotiate with each other and with policy makers, and outcomes are contingent upon individual and collective resources and constraints (Goggin et al., 1990). Thus, analyses are concerned with revealing the structure and complexity of networks, partnerships and alliances, understanding who is involved in implementation, and examining their motives, the nature of their influence, and the relative strengths of relationships. Effective multi-party collaboration therefore tends to be prescribed as one of the key requirements for improved implementation. In addition, Elmore (1985) suggested that policy designers should begin with "forward mapping" to identify available policy instruments and resources and then carry out "backward mapping" to assess the incentives for implementers and target groups to accept change. There has been a resurgence of interest in policy implementation research in the last few years, with a particular focus on improving understanding of the ways in which actors operating at different levels influence the implementation process and the realization of, or divergence from, original policy goals (Saetren, 2005). For example, May and Winter (2009) found that the actions of implementers were influenced by their understandings of policy goals, their professional knowledge and their own evaluations of policy. In addition, the degree of attention given to policy reforms by relevant municipal politicians, and the amount of supervision or delegation offered by managers, were found to be significant influences on the policy emphases of street-level implementers. Oosterwaal and Torenvlied (2012) identified political conflict among key legislators as a key influence

Table 1. Alternative policy situations. Adapted from Berman (1980).

Situational characteristics	Situational type	
	<i>Structured</i>	<i>Unstructured</i>
Scope of change	Incremental	Major
Certainty of technology or theory	Certain within risk	Uncertain
Conflict over policy's goals and means	Low conflict	High conflict
Structure of institutional setting	Tightly coupled	Loosely coupled
Stability of environment	Stable	Unstable

Table 2. Development of policy implementation frameworks.

Developmental phase	Descriptive mode	Analytical mode	Prescriptive mode
Phase 1: Implementation as administrative competency	<p>Policy objectives defined by government</p> <p>Set tasks implemented through hierarchical structures</p>	Comparison of implementers' actions with stated policy objectives	<p>Case-specific recommendations</p> <p>Provide adequate resources, information, skills and administrative arrangements</p>
Phase 2: Implementation as top-down and bottom-up decision making	<p>Top-down: policy-centred bureaucratic control</p> <p>Bottom-up: ground-level policy formulation and implementation</p>	Evaluation of actual practices using general models	<p>Top-down: maximize direction and minimize discretion</p> <p>Bottom-up: maximize discretion and minimize direction</p>
Phase 3: Implementation as inter-organizational negotiation	Policy objectives created, modified and implemented through interactions among powerful and knowledgeable actors	<p>Analysis of policy and implementation networks, relationships, resources and constraints</p> <p>Assessment of influencing variables: understanding of policy goals, political and managerial support, agency preferences, incentives and conflict</p>	<p>Facilitate cooperation and collaboration, build trust and increase experience</p> <p>Map available policy instruments, resources and incentives to accept change</p> <p>Develop implementation strategies according to the complexity of the policy task</p>

which reinforced the effect of agency preferences. Using the concept of “policy alienation”, Tummers (2011) argued that clarifying the value of a policy is important in getting professionals to willingly implement it. Others have examined the influences of inter-organizational relationships on implementation processes and outcomes. Daley (2009) found that previous collaborative experience and structural factors such as trust and the use of performance evaluations were important influences in inter-agency efforts to solve complex environmental and public health problems. However, Lundin (2007) found that the impacts of cooperation and collaboration were dependent on the difficulty of the tasks being undertaken. Specifically, complex policies were found to be more effectively put into practice if there were high levels of inter-agency cooperation, but cooperation did not improve the implementation of less difficult tasks. Lundin therefore concluded that public-sector decision makers should reflect on the necessity of inter-organizational cooperation in each policy case or situation rather than assuming that a partnership-based approach will always enhance implementation efforts.

These different perspectives on policy implementation (Table 2) are extremely informative and pertinent to current debates regarding IWRM. Specifically, their associated concepts and models can help to improve understanding of how IWRM has been implemented in different contexts and to assess the potential benefits of alternative approaches.

IWRM in England

Establishing how IWRM has been conceptualized and the extent to which this approach is accepted by policy makers and resource managers in England is an important aspect of examining and understanding the implementation process. It is significant that there are no explicit statements or direct commitments pertaining to IWRM in key public policies published in the last 15 years, including the UK sustainable development strategy (Secretary of State for Environment, Food and Rural Affairs, 2005), the water resources strategy for England and Wales (Environment Agency, 2009), or the current coalition government’s policy statements on the natural environment and water (Secretary of State for Environment, Food and Rural Affairs, 2011a, 2011b). Nevertheless, there are references within water policies to the development of integrated or ecosystem-based approaches. In particular, the WFD and catchment (i.e. watershed) management have been identified by the government as key policies designed to protect and improve the water environment whilst ensuring that human needs are met. As such, IWRM is implicit rather than explicit within public policy. This raises the dual question: What exactly is IWRM in England, and how is it implemented?

The EU Water Framework Directive

The WFD became EU law in 2000, marking the beginning of a more holistic approach to restoring and protecting aquatic systems and ensuring sustainable water use (McCormick, 2001). According to the European Commission (2012), the WFD brings together economic and ecological perspectives on water and incorporates the key principles of integrated river basin management within a legally binding instrument (Carter & White, 2012). The main objective is to achieve good ecological and chemical status for all surface waters and good quantitative and chemical status for groundwater by 2027 at the latest. In turn, this is intended to protect aquatic species and ecological habitats, and maintain safe water for drinking and bathing.

The member states of the EU are expected to achieve these goals and objectives by producing and implementing river basin management plans (RBMPs) and accompanying programmes of measures (PoMs). Initially, member states were required to transpose the legal text of the WFD into national statutes and regulations and to designate 'competent authorities' with responsibility for their implementation. Next, by 2004, the competent authorities were required to produce a characterization of each river basin district (RBD) under their sole or joint jurisdiction which included analysis of pressures and impacts, analysis of the economic uses of water, and delineation of water bodies. Technical arrangements also had to be implemented, including typologies and reference conditions for surface waters in each RBD and methods to assess ecological status, prior to the commencement of three planning cycles (2009–15, 2015–21, 2021–27) during which cost-effective combinations of regulatory, financial and voluntary measures are to be implemented. Article 14 of the WFD requires that competent authorities provide opportunities for public participation throughout the process, along with full and transparent disclosure of technical documents and draft and complete RBMPs and PoMs. Member states are required to follow a strict timetable of implementation and reporting of progress to the European Commission via the Water Information Service for Europe. There are 174 RBDs in the EU, of which 75% include transboundary waters, and 21 different reporting languages are used. As such, implementation of the WFD across the whole of the EU is extremely complex and challenging.

In England (and in Wales, prior to April 2013), the Environment Agency (EA) was designated by the national government as the competent authority for implementing the WFD (Green & Fernández-Bilbao, 2006). The EA is an executive non-departmental public body with responsibilities for environmental regulation, control of flooding and coastal erosion, management of water quality and resources, regulation of waste and contaminated land, climate change adaptation, conservation of fisheries and ecology, and maintenance of river navigation.

The EA recognized that effective implementation of the WFD would require close cooperation and the development of new working relationships with other organizations and groups. However, this represented a significant challenge for a regulatory organization and the management style and technocratic culture of the EA had a very strong influence on the design and implementation of arrangements for the WFD.

The EA adopted a top-down approach for the designation of RBDs and assessment of environmental conditions. Just 10 large-scale RBDs were established as the principal units for river basin planning for the whole of England, including 2 which are shared with Scotland and 2 with Wales. The RBD units corresponded with the regional operating areas of the EA, and originated from the privatization of the water industry in England in 1989 and the establishment of the National Rivers Authority, which the EA subsequently replaced. In total, the 6 RBDs entirely within England include 83 separate catchment areas and more than 6000 separate water bodies (rivers, estuaries, lakes, canals and groundwater areas). The EA chose to rely on data from its own water quality monitoring programme and not to use information available from other organizations and sources as part of the assessment of RBD conditions. Furthermore, the planning process was designed to focus on organizations and groups which the EA thought could directly contribute to the implementation of the PoM for each RBD, rather than a wider range of water users and stakeholders. For each RBD, the EA established a regional liaison panel which includes 15 representatives of 'co-delivery' organizations. In addition, there is a WFD national liaison panel, made up of 20 people representing co-delivery organizations. Members of the public and representatives for other interests are allowed to attend liaison panel meetings,

but only as observers. The effectiveness of this arrangement has been questioned, and Watson, Deeming, and Treffny (2009) reported that some members of liaison panels felt that the arrangements were designed to provide the EA with advice rather than to enable joint decision making.

This top-down and agency-centred approach to implementing the WFD attracted some strong criticism from water and environmental interests, particularly in 2009 when the first RBMPs were published. Common criticisms were that the plans did not provide an accurate representation of conditions because of their focus on large-scale districts rather than catchments and sub-catchments; that proposed targets and measures for water quality and environmental improvements were not sufficiently ambitious; and that insufficient opportunities had been created for water interests and the public to participate in the planning process. In 2010, these concerns prompted the Angling Trust and the World Wildlife Fund UK to jointly seek a judicial review of the WFD implementation process in England and Wales. In response, the Secretary of State for Environment, Food and Rural Affairs made a commitment to conduct a full policy review of the river basin planning and management process. Consequently, the request for a judicial review was withdrawn. In February 2011, the Secretary of State signalled government support for a new policy initiative to improve implementation of the WFD in England, which became known as the 'catchment-based approach'.

The catchment-based approach

On 22 March 2011 (World Water Day), the Secretary of State announced the launch of a catchment-based approach (CaBA) that would promote collaborative management of land, water and related resources throughout England. CaBA was proposed as a process that would enable organizations, groups and communities to develop and implement cost-effective solutions to water-related problems. The national government anticipated that this approach would contribute to the successful implementation of the WFD and deliver additional local benefits related to, for example, flooding risk management, climate change adaptation and the protection of water supplies. It is important to note that CaBA was introduced as an *addition* to the existing institutional arrangements and was not intended as a replacement for the existing WFD implementation process.

Government policy makers were aware that catchment-scale collaborative management had been developed in other parts of the world since the 1980s, but recognized that it had not been previously tried in England. To be clear, catchment-scale management has a long and established history in England and the rest of the UK, but the addition of an explicit *collaborative* element is new. Therefore, the government proposed an initial experimental phase of policy development and implementation which involved 25 catchment management pilot projects and 37 additional catchment-scale initiatives. Ten of the pilot projects were hosted by the EA, and 15 were hosted by rivers trusts (5), regeneration organizations (4), national park authorities (2), water companies (2) and wildlife trusts (2). The 37 additional initiatives were hosted by a similarly diverse range of organizations. Each pilot project received £30,000, and each additional catchment initiative received £5000 in government funding. The host organizations for the pilot projects participated in a national learning programme designed to support the development of catchment-scale collaborative approaches and arrangements. Nevertheless, the host organizations had discretion to develop pilot projects and additional initiatives as they judged appropriate for local conditions and circumstances. All of the pilot projects and additional initiatives were independently evaluated by researchers acting

on behalf of the government (Cascade Consulting, 2013). A sample of the additional initiatives was also the subject of a separate piece of research conducted by the author (Watson, 2013).

The findings from the evaluation indicated that the development phase of CaBA had been a success, particularly with respect to collaborative planning activity and stakeholder engagement. By December 2012, a total of 21 catchment-scale plans and 4 outline plans had been produced by catchment pilot groups. In the additional 37 catchment initiatives, groups had started to develop a wide range of collaborative arrangements and actions, reflecting the varied conditions and circumstances in individual catchments, the interests and priorities of the hosts, the nature and strength of inter-organizational relationships, and the prior history of water and resource management in the area.

All of the pilot projects and initiatives had a distinctive focus on improving and protecting environmental quality within each catchment area. However, there were also important differences in terms of how an environmental focus was defined and developed. The majority of collaborative groups had directed their attention towards water quality issues and believed that their catchment plans and proposed actions could directly contribute to the achievement of targets established through the WFD implementation process. However, there were cases where collaborative groups defined their catchment 'system' in much broader terms and were addressing issues that fell outside of the remit of the WFD, as well as within. In those cases, groups were seeking to influence initiatives related to, for example, flooding, farming and rural land use, and landscape conservation, in addition to the implementation of the WFD. However, the evaluators uncovered a general concern among host organizations and catchment groups regarding the relationship between CaBA and the implementation of the WFD. Catchment groups were concerned that their plans and potential actions would be overlooked by the EA because of the lack of clear and explicit processes or mechanisms linking the two levels of water planning (Watson, 2013).

In May 2013, the government published a policy framework to encourage wider adoption of an integrated catchment-based approach to improving the quality of the water environment (Department for Environment, Food and Rural Affairs, 2013). The policy confirmed national government intentions to implement the catchment-based approach across the whole of England, with the objectives of:

- delivering positive and sustained outcomes for the water environment by promoting a better understanding at a local level, and
- encouraging local collaboration and more transparent decision making when both planning and delivering activities to improve the water environment.

The policy framework proposes that catchment partnerships "inform the river basin district planning process and become integral to the way that Water Framework Directive objectives are delivered" (p. 5). However, it is not made clear how the top-down WFD implementation process might be effectively linked with the more bottom-up catchment-based approach.

Bridging the implementation gap

The preceding account might suggest that, since 2000, IWRM in England has been a case of adaptive management whereby initial interventions aimed at implementing the WFD have been adjusted on the basis of experience, and that this has led to a shift towards a more locally centred and collaborative approach. However, the emergence of two parallel

sets of arrangements for implementing the WFD and CaBA suggests that, while changes have occurred in the water management regime, the more fundamental structures and power relations pertaining to water governance which determine how decisions are made and which interests are represented have not changed at all, and future arrangements are still undetermined. In effect, the water governance regime is still defined by and encapsulated within the top-down WFD implementation process operated by the EA, while water management has graduated towards a more bottom-up catchment-based approach involving a more diverse mix of organizations and groups.

In principle, the WFD and CaBA are compatible, because they both represent area-based interpretations of IWRM and also emphasize the improvement and protection of water and environmental quality as a precursor for future sustainable resource use. Nevertheless, there are also significant differences and tensions between the two sets of arrangements. They operate at very different spatial scales, and the WFD is mandated and driven by supra-national legal requirements while CaBA is based on political commitment and administrative policy at the national level. Furthermore, the WFD implementation process includes matters of both governance and management, is agency-centred, and is reliant on technical data collection and analysis undertaken by just one public authority. The WFD process involves select participants who are perceived to have the power and capacity to deliver environmental improvements, and is managed according to a strict timetable and reporting requirements. In contrast, CaBA is oriented towards operational planning and management; and it is based on voluntary support and collaboration, more varied sources and types of knowledge, self-selected participation, and consensus-based decision making. These differences are significant because successful implementation of IWRM in England depends on the relationship between these two scale-dependent regimes just as much as, if not more than, the effectiveness of their separate internal processes and arrangements.

The relationship between the arrangements for implementing the WFD and CaBA is an example of what Young (2006, 2013) describes as “vertical interplay”. Patterns of vertical interplay reflect differences in the behaviours, knowledge and compliance systems, policy instruments and social settings of actors operating within two or more scale-dependent environmental regimes. Contrasting patterns or types of interplay are likely to produce different outcomes in terms of ecological sustainability, social welfare, efficiency, equity and cultural autonomy. As such, different outcomes relative to the goals and objectives of IWRM will be produced according to the pattern of interplay that currently exists, or could be created, between the WFD and CaBA implementation processes. Conceptually and analytically, recognizing the importance of different forms of interplay is an important step forward in understanding and improving the implementation of IWRM in complex governance situations.

According to Young (2006), five major types or patterns of cross-level, scale-dependent interplay can be identified from an examination of interactions among actual resource management and governance regimes. First, interactions may be characterized by the dominance of a regime operating at one level over regimes functioning at other levels. In many respects, this pattern describes the implementation of the WFD in England prior to 2011 and the launch of CaBA, when power was vested in the EA as the authority in control of what subsequently became a technical process of setting ecological standards, assessing and characterizing environmental conditions, and producing plans for entire RBDs. Dominance was also reflected in the adopted discourse of planning and management, including the use of terms such as ‘co-delivery’ and ‘liaison’ as means of orchestrating participation and emphasizing the very limited extent of potential shifts in

power relations between the EA and other interests. Second, the relationships among regimes may be characterized by separation. This pattern is evident in the present relationship between the implementation processes for the WFD and CaBA in England, with each in practice operating within a different domain, although policy makers have recognized the need for stronger linkages in both spatial and organizational terms (Department for Environment, Food and Rural Affairs, 2013). The current vertically fragmented arrangement is unlikely to produce effective overall responses to complex and multi-scalar resource problems. It may increase problems of poor coordination and actually undermine efforts to implement the WFD and deliver outcomes consistent with the objectives and principles of IWRM. Third, mergers are attempts to internalize cross-scale conflicts by creating single, integrated regimes. However, experience suggests that this approach tends to only relocate edge and boundary problems rather than actually resolving the conflicts that occur among different governance and management regimes (Mitchell, 2005). With regard to the WFD–CaBA relationship, a merger does not appear feasible given their strikingly different modes of operation. A merger could also be counter-productive in that it may adversely affect the ability of the EA to perform its other national-scale and regional-scale regulatory functions related to air quality, contaminated land, and water quality and quantity.

Fourth, *negotiated agreements* can be used to provide mutually acceptable hybrid arrangements that define the roles and relationships among actors associated with the different scale-dependent regimes. A major advantage of negotiation is that it provides flexibility so that cross-scale arrangements can be designed for particular situations and adapted to changes in circumstances over time. For example, different degrees of positive interplay may be developed, ranging from cooperation and coordination through to collaboration, and applied broadly to matters of governance or more narrowly to specific resource management activities and functions (Armitage, Berkes, & Doubleday, 2007; Berkes, 2009; Margerum, 2011). As such, particular co-governance and co-management arrangements might be based on the sharing of formal power and authority but alternatively might operate informally on the basis of social trust and commitment to consensual decision making. In the context of WFD–CaBA relationships, negotiation does have potential. However, this strategy would require the EA to negotiate with CaBA groups, even though the EA is tied to a supra-national legal agreement that limits the scope for compromise and trade-offs. A potential risk with a negotiated approach is that some CaBA groups may achieve better outcomes than others, leading to possible claims of procedural injustice and unfair distributions of benefits and costs.

A fifth approach to cross-scale interplay involves systemic change and the development of arrangements to bridge the gaps among scale-dependent regimes. To some extent, this approach also relies on effective multi-party negotiation, but interplay is likely to take place in a more structured and formally recognized setting that could involve the establishment of bridging or intermediary organizations such as collaborative councils, commissions, or alliances, designed to link different arenas of decision making. Bridging organizations and similar multi-party platforms, such as river basin councils and catchment management trusts, could be used to clarify the meaning and scope of IWRM in an English context and to develop a more explicit vision for IWRM based on principles that reflect the objectives of the WFD, CaBA and other relevant policy initiatives.

There are likely to be significant transaction costs associated with the development of a new system of cross-scale and multi-party water governance and management in England, and potentially resistance and blocking tactics from local groups as well as national agencies, given the changes to organizational structures, shifts in power relations and

reductions in individual autonomy that are inevitably involved. Nevertheless, significant changes to the arrangements for water governance will be necessary in order for the WFD, CaBA and other water initiatives to be effectively linked and for the ambitious goals of IWRM to be realized. Given the complexities and uncertainties involved in such a transition, making a blueprint for cross-scale collaborative water governance and management is not appropriate. However, a proactive, experimental and adaptive process of institutional change could be developed by increasing interaction and dialogue among diverse organizations, groups and resource users operating in different functional and scale-dependent arenas. The development of such an approach for IWRM would have inevitable institutional consequences and would probably require the EA's role as competent authority to be redefined. This does not necessarily mean that the EA should not continue to have formal legal responsibility for the WFD, but it does imply that a new set of organizational norms and behaviours should be adopted that reflect core principles of collaborative decision making, such as power sharing, negotiation, mutual trust and respect, deliberative exchange and learning, and a willingness to accept compromises.

A useful step towards a cross-scale approach to IWRM implementation would be for the national government to propose an explicit vision of IWRM that integrates the requirements of the WFD and CaBA and to establish clear normative principles for the design of collaborative arrangements.

Conclusions and implications

This article has revealed some of the complexities of policy implementation and has challenged the assumption that the difficulties that can arise during the implementation of IWRM can be explained by a simple lack of commitment or provision of inadequate resources. It is true that these basic factors can damage the effectiveness and credibility of IWRM. However, even well-resourced initiatives which receive strong political support are likely to under-perform if the nature of the implementation environment and institutional setting is not adequately taken into account. In practice, there are likely to be situations where bottom-up, top-down, or hybrid combinations of these two approaches are most appropriate for the effective implementation of IWRM. Therefore, the prospects for successful implementation can be greatly improved by ensuring that analysis of the particular institutional environment is carried out as an integral part of the policy-making process and is used to inform the design of an appropriate IWRM implementation strategy. By carrying out this kind of institutional analysis, implementation strategies can be matched more carefully with existing operating environments. At the same time, analysis may reveal opportunities to reform aspects of the institutional environment that would allow a desired implementation approach or strategy to be applied more successfully. For example, a bottom-up strategy may be regarded as desirable in order to reach the goals of IWRM, but this may be contingent upon implementing changes to the wider institutional arrangements for water governance and management.

In very complex governance settings, effective implementation of IWRM is likely to require a combination of top-down and bottom-up arrangements. As was shown through the analysis of arrangements in England, IWRM tends to be embedded within a number of very different scale-dependent governance and management regimes which have their own unique operating modes and styles of decision making. In the case of the WFD in England, IWRM has been pursued using a top-down and structured approach to implementation, while almost the exact opposite has been the case with CaBA. The approach adopted for the WFD has been problematic, and CaBA was developed by the

national government as a remedy. However, the remedy was applied at a different spatial scale, and without adequate attention to the necessary links to the WFD process, where the implementation difficulties originated. As such, in England, stronger cross-scale institutional links are critical to the successful implementation of IWRM, suggesting that bridging mechanisms or even new boundary-spanning organizations will be required to act as intermediaries and to provide platforms for multi-stakeholder dialogue and collaboration.

The analysis of arrangements in England also points to the importance of remaining alert to the various ways in which IWRM is defined and interpreted. In this sense, it is important to establish what IWRM actually means or refers to in a particular policy context. In England, IWRM is not an explicit feature of water policy but certainly is implied, both in the WFD and in government statements pertaining to CaBA. A lack of clarity in policy can exacerbate other implementation difficulties and undermine the overall effectiveness of IWRM. An effective way to provide greater clarity and a stronger sense of direction is for planners and managers operating in different policy arenas and at different institutional levels to create a shared vision for IWRM that identifies what is desirable and feasible for the future and articulates the principles that will guide actions towards the desired end state (Mitchell, 2006).

The example of the WFD–CaBA relationship is by no means unique, and sheds light on a more general global problem where resource and environmental management policy is implemented via congruent but disconnected scale-dependent resource governance and management regimes (Folke, Pritchard, Berkes, Colding, & Svedin, 2007). In these kinds of complex operating environments, interventions are needed across a range of spatial and temporal scales. Effective implementation of IWRM, and many other approaches to resource and environmental management, is really a matter of finding ways to strengthen cross-scale interplay and sharing of power among regimes through the development of new systems for resource co-governance and co-management. Although this article has focused on the challenges of vertical interplay, relationships among regimes operating at similar spatial scales can also have a significant impact on the implementation of IWRM. Therefore, co-governance and co-management arrangements should include processes and mechanisms that enable both horizontal and vertical interaction, and encourage collaboration among multiple scale-dependent regimes (Olsson, Folke, Galaz, Hahn, & Schutz, 2007).

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