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Organisational Understandings and Commitments for Collaborative Catchment Management: A Survey of Local Initiatives

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Executive Summary

Catchment or watershed based management of land and water is recognised internationally as an important approach for environmental protection and sustainable resource use. However, many uncertainties exist regarding how the concept can be successfully implemented in different circumstances. Since March 2011, the UK government, the Environment Agency and a variety of other organisations have been experimenting with the development of a new catchment-based approach that is designed to encourage collaborative planning and implementation of actions at the local scale. In addition to twenty-five catchment management pilot projects, government funding was provided for an additional thirty-seven locally-organised catchment management initiatives.

This report presents findings from a survey of organisations that were acting as hosts for some of the additional thirty-seven initiatives, considers the implications for public policy, and also offers recommendations for the future development of the catchment-based approach. In brief, the findings indicate that:

- The development of individual catchment-based initiatives has been influenced by contextual conditions at the national and local scale. Uncertainties about the future of government policy and potential funding arrangements have resulted in the host organisations adopting a cautious approach. Locally, the priorities of the host organisations, the interests represented through established networks and the levels of support shown by landowners have had a strong bearing on the interpretation or 'framing' of the catchment-based approach. The implication is that, as currently constituted, the catchment-based approach is unlikely to bring about a radical transformation or shift in practices towards collaborative planning and management of whole catchment systems. *A key recommendation for government therefore is that greater policy clarity should be provided regarding the intended scope of the catchment-based approach. This would encourage local groups to consider a wider set of inter-connections that affect their catchment, including relationships between environmental quality and economic activity and also the policies, regulations and other institutional arrangements that affect the way in which water, land and other resources are utilised.*

- Collaboration is recognised by host organisations as an important factor in the success of catchment-scale planning and management. In general, host organisations are building collaborative arrangements around quite narrowly defined problems according to their own priorities and the interests of other organisations and groups involved in local nature conservation, habitat management and river restoration networks. This implies that the kind of organisation that is nominated or selected as a host has a significant impact on the framing and prioritisation of problems, the types of partners which are recruited, and the orientation of the catchment-based initiative. *It is therefore recommended that government produces additional guidance on the hosting role, including the organisational characteristics and approaches that*

are needed in order to successfully design and facilitate a truly collaborative catchment planning and management process. This should include, for example, advice on the importance of carrying out a detailed stakeholder analysis as a precursor to the formation of a steering group so that the problem-framing activities include a broad and balanced range of interests and perspectives.

- Many of the collaborative groups are still in the early stages of development, and shared strategic objectives have yet to be agreed in most cases. However, a number of approaches to setting long-term goals are being used which reflect different attitudes and understandings of the host organisations regarding directing and facilitating collective decision making. In addition, uncertainties regarding the state of knowledge and the nature of problems within the catchment are more openly acknowledged in some cases more than others. This may imply that catchment-based initiatives can be 'misdirected' when uncertainties and gaps in knowledge are overlooked and alternative accounts and interpretations of problems are not fully considered. *A recommendation for both government and local catchment groups is that the desire to rush in and to attempt to solve problems quickly should be resisted. Sufficient time needs to be allowed for directions to be set on the basis of collective debate and judgement regarding what is and is not known about the use and condition of the catchment. Furthermore, catchment management groups should be encouraged to remain open to the possibility that their direction may need to change over time, and that goals and objectives may need to be adjusted as circumstances change, new knowledge emerges and collective understandings evolve.*

- Currently, host organisations are attempting to establish a niche for catchment-based initiatives alongside other more established projects with overlapping aims and objectives. Host organisations have tended to take a pragmatic approach to developing collaborative arrangements and typically have created ad hoc steering groups that include representatives for groups and organisations that they already know and trust through local networks. The need for more formal inter-organisational arrangements, which may offer advantages in terms of improved catchment governance, has received limited attention to date from the host organisations and local steering groups. These findings imply that collaborative structures for catchment management tend to evolve over time according to the dynamics and power of inter-organisational relationships. Initially, ad hoc arrangements appear to be quite effective but as the initiatives develop, issues related to catchment governance such as fair representation of legitimate interests, funding arrangements, rules for decision making, the resolution of disagreements and disputes, and the role of the public alongside organised groups begin to emerge. *A key recommendation for government, therefore, is that further guidance is provided on how the transition from catchment-based management to catchment-scale governance can be made, including advice on the range of alterative organisational models and design principles that can be used to enable collaborative decision making. Advice should be included on the role of facilitation, negotiation, deliberation, multi-party dialogue and public participation in catchment planning and management.*

- The catchment-based approach can be successful in delivering environmental improvements, particularly where attention is focussed on particular problems or sites which are important to the host organisations and other local actors who share their interests and concerns. However, the rate of progress is determined by local circumstances and the strength of existing inter-organisational relationships. Furthermore, the impact of the catchment-based initiatives is limited by their dependence upon voluntary co-operation and lack of strong linkages to key policy processes pertaining to river basin district planning, farming, local economic development, land use planning and water services. As constructed at present, the catchment-based approach does have an impact in specific policy areas related to nature conservation, habitat management and river restoration but is not sufficiently robust or connected to other institutional arrangements that fundamentally affect the use of land and water. *A final recommendation for government therefore is to clarify and strengthen the relationship between the catchment-based approach and arrangements for the implementation of the WFD, including the preparation and implementation of plans at the river basin district scale. In addition, the strength and legitimacy of the catchment-based approach could be enhanced in a number of ways, including the introduction of limited co-funding arrangements that include a mix of national and local contributions, demonstrating wide-spread political support from government ministers with responsibilities across a range of policy areas and civil service departments, and actively promoting the philosophy and mutual benefits of catchment management to audiences within local government, civic society and the water utilities sector.*

- Overall, the research findings indicate that whilst much of the literature portrays collaboration as a distinct and clearly defined form of interaction, in reality it is a far more dynamic, diverse and unpredictable type of process. Given the opportunity to develop collaborative catchment-based initiatives, host organisations and local groups have self-organised, defined problems, and set directions in different ways and developed their own strategies for producing outputs and achieving outcomes which matter the most to them. This kind of institutional innovation and local creativity should be welcomed and encouraged and not stifled by the imposition of a particular model of collaboration or insistence that certain methods or practices are followed. At the same time, it is important to recognise that local catchment management groups are working together in varied ways and for different reasons. Individually, they are able to move forward at different speeds according to local contextual conditions, their abilities to harness knowledge, skills and resources, their capacity to agree on collective goals and ambitions, and also the level of complexity and uncertainty that characterise the problems within their catchment area. In the future, many alternative resource management and governance arrangements are likely to emerge that could produce different mixes of local benefits and therefore potentially create more variation in terms of the use, quality and condition of catchment landscapes.

Introduction

Critical problems concerning the use and management of water cannot be adequately resolved through technical interventions alone, but also require innovations in institutional arrangements and policy approaches. Although this requirement is now widely recognised among governments, businesses, scientists, civic groups and resource users in the water arena, the outcomes of many of our efforts to reform policies and to implement new management approaches continue to fall short of expectations. This situation has arisen despite the introduction in the last few decades of Integrated Water Resources Management (IWRM) and other similar ecosystem-based frameworks, which seek to improve co-ordination of land and water policy and practices, promote equitable resource allocation and access, and maintain ecological integrity (Mitchell, 2005; Biswas, 2008; Molle, 2008). It appears that implementation of these approaches, as they are currently conceived, has not brought about the step-changes and paradigm shifts that are essential for securing more sustainable futures.

A growing number of water analysts and practitioners agree that 'collaboration' is a critical element that is missing from current policy reform packages, and that future efforts should be directed at creating more joined-up responses to water problems whereby power and responsibility are shared within multi-party groups, thus enabling collective actions to be devised and effectively implemented. By working collaboratively, it is claimed, knowledge and resources held by different public, private and voluntary sector actors can be brought together to build consensus and generate stronger commitments towards purposive action. By creating 'collaborative capital', ambitious and innovative actions become possible that the individual actors could not accomplish either by operating alone or by simply consulting with each other.

A substantial body of literature exists on collaborative environmental planning and management, and there has been some significant research interest in collaborative water management in some countries, such as the United States (for example, Wondolleck and Yaffee, 2000; Imperial, 2005). However, comparatively little is known about collaborative efforts to manage water resources in other geographic contexts or the experiences of collaborative groups designed to manage entire catchment areas (i.e., watersheds). Furthermore, much of the literature on collaborative catchment management that does exist tends to be descriptive rather than analytical or theoretically informed. This report seeks to address this gap and to improve understanding by critically examining and comparing recent experiences of collaborative catchment management in England. In March 2011, the UK Government announced a new policy advocating a catchment-based approach for the management of land and water resources at the local scale. This report examines understandings and experiences of some of the key people involved in local initiatives which have emerged in response to the government call. However, rather than simply providing an evaluation of policy implementation, a more critical perspective is adopted that focusses on how catchment management groups have defined or 'framed' collaboration and how they have begun to develop a collaborative approach based on their own interpretations of the concept and their understandings of local circumstances and needs. 'Frames' embody sets of ideas, beliefs, preconceptions and assumptions about the situation at-hand and serve as guides for the development of responses to recognised problems, including the strategies and actions

that are considered to be appropriate and likely to be most effective in bringing the problems under control (Bardwell, 1991). As such, adopted frames reflect understandings of problems and potential response to those problems, as constructed by the problem-solvers themselves. Problem-framing is a very useful concept for understanding how collaborative approaches to catchment management are developed because the outcome of any policy initiative depends on how problems are initially defined and how problem-responses are subsequently designed and implemented.

The research presented in this report examined two key questions: how is collaborative working currently interpreted or 'framed' by the hosts of local catchment management initiatives; and how do the adopted frames influence the development of strategies designed to enable collaborative catchment management? In addition, the report considers the implications of the research findings for future government policy and further development of the catchment-based approach. As such, an in-depth analysis is provided of the early development of the catchment-based approach in England between March 2011 and March 2013. The report begins by examining the increasing complexity of water management and the changes in circumstances which have created a new type of operating environment for governments, water agencies and other actors. Attention is then turned to collaboration theory, including key aspects and elements of collaborative processes, and also remaining concerns and questions regarding the impacts and implications of collaborative management. The background to the development of the catchment-based approach in England is then described, followed by an explanation of the approach and methods used for this study. Next, the main research findings regarding understandings of collaboration and the practices of emergent catchment management groups are presented. Finally, the main conclusions are presented and the implications for policy and future development of collaborative catchment management are discussed.

The New Complexity of Water Management

The management of water is becoming increasingly complex, uncertain, protracted and difficult, raising fundamental questions about the adequacy of existing approaches and creating new demands for policy innovation (Connick and Innes, 2003). Although many different explanations have been put forward to account for these changing circumstances, three different perspectives and associated sets of arguments can be discerned. First, viewed from a *planning and science* perspective, water has become much more deeply embedded within a diverse range of economic and cultural activities related to, for example, food production, health, energy, transportation, recreation, disaster prevention, environmental protection and biodiversity management. Because understanding of the complex linkages and changing inter-relationships among the different functions and uses of water is far from complete, a new type kind of 'post-normal' set of circumstances has emerged in which scientific knowledge can no longer be relied upon as a basis for making planning decisions or for predicting future system behaviours and outcomes (Funtowicz and Ravetz, 1993). In the words of Westra (1997: 238):

"…values are now in the ascendant, and the 'facts' are recognised to be 'soft'. Rather than expecting the indisputable results of linear, deductive science, where all serious hypotheses are definitely falsifiable, the post-normal scientific paradigm recognises the necessity of stakeholders' input in all decisions, as the 'experts', scientists and technocrats alike can give us, at best, intelligent, well-educated possibilities when predicting the future consequences of some risky activity."

In addition, decision makers have to contend with, and attempt to balance, the demands placed on water resources by numerous actors with varied degrees of power as well as different needs, priorities, beliefs and values. Consequently, water management itself has become an arena filled with an ever-increasing number of 'wicked' or 'messy' problems which require attention to be given to political, economic, social and cultural factors as well as technical and bio-physical elements (Ludwig 2001; McCool and Guthrie, 2001; Norton, 2012). As observed by Lachapelle et al. (2003), messy problems are notoriously difficult to handle because of multiple and competing goals, lack of understanding and scientific agreement on cause-effect relationships, limited time and resources, and structural inequalities in access to information and the distribution of authority and power. Catchment management typifies this sort of situation.

A second *spatial* perspective emphasizes challenges related to the organisation and structure of water management. Efforts to improve the management of water often encounter significant obstacles and challenges related to poor 'spatial fit' (Moss, 2004; 2012). It is often argued that catchment/watershed or river basin areas represent the ideal spatial unit for planning and management because they encapsulate key system dynamics and functional linkages (Jaspers, 2003). However, other resource uses and management functions, related to agriculture, forestry and land-use planning, for example, as well as broader political and administrative arrangements, usually operate at very different spatial scales. These critical non-hydrologic system components are often structured in very different ways to each other and typically do not fit with watershed or river basin management arrangements or spatial boundaries. In short, many water management initiatives have failed because watersheds rarely if ever coincide with 'policy-sheds' (Cohen and Davidson, 2011). Even when efforts are made to re-structure policies to coincide with hydrologic scales, water managers can encounter strong external opposition from those who do not share the same ideology or objectives (Blomquist and Schlager, 2005). Furthermore, as observed by Mitchell (2005), 'edge' or 'boundary' problems tend to be moved rather than removed when organisational structures are reformed. Commenting further on the spatial dimensions of watershed management, O'Neill (2005) argued that organisational resources, perceptions and experiences are unevenly distributed across urban and rural areas and yet must be combined to enable collaboration. Furthermore, O'Neill suggested that, to be effective, water management initiatives should take three inter-related dimensions of space into account. 'Conceived space' is the space envisioned by planners and policy makers as represented in their blueprints and plans which are used to deliver physical projects or to bring about administrative changes. In contrast, 'perceived space' refers to the views that people have of a particular space and its intended uses, while 'lived space' indicates how inhabitants actually use and experience a space according to the emotional meanings attached to their sense of place. This implies that watershed management initiatives must not only be capable of

dealing with the many different versions of conceived space which have been created by planners, managers and other professional groups, but must also work within social and cultural spaces and recognise the values and meanings which are associated with the water environment.

A third *socio-cultural* perspective focusses on the fundamental changes within society which have taken place during recent decades which also affect the operating environment for water policy, planning and management. As early as the 1970s, organisational behaviourists and social ecologists began to examine the consequences of a shift from an industrial to a post-industrial order in which people and organisations were becoming increasingly inter-connected and dependent on one another. Trist (1980) referred to this new type of operating environment as the 'turbulent field' and described it as a situation where the power to decide and control is fluidly dispersed and no single organisation, regardless of size or power, has the capacity to go it alone or to regulate the actions of the other agents within their shared 'domain'. Unfortunately, many of our existing institutional structures and processes were designed to function in much more stable conditions rather than the turbulent environment which now exists. This situation has profound implications for the management of water, since mismatches between emerging environmental conditions and existing response capacities imply that institutional arrangements for water management are becoming progressively outmoded and mal-adapted (Watson et al. 2009). This is likely to be true for individual organisations, such as government ministries, departments, agencies and other types of water management body that were designed according to hierarchical and bureaucratic principles. Additional challenges have arisen as a consequence of the on-going processes of social change. In a new age driven by revolutions in information and technology, the material basis and structure of society has fundamentally altered, causing social fragmentation and a sense of alienation. Consequently, meaningful communication and understanding have become far more difficult to nurture and maintain (Castells, 1996). These fundamental socio-cultural changes, it is argued, have eroded established forms of social capital in neighbourhoods and communities but at the same time have also led to new patterns of social engagement and interaction. Consequently, organisational flexibility, decentralization and networking have become essential strategies for surviving in the de-structured, chaotic and much less predictable global system that has emerged in the last few decades.

In these new operating conditions, characterised by pervasive uncertainties, rapid and unpredictable change, complex political, economic and ecological dynamics, plus increasing social and institutional fragmentation, the need to develop effective responses to water problems has become an even greater challenge. Tried-and-tested top-down managerial and decision-making approaches can no longer be depended upon to provide adequate solutions, and policy makers and water managers need to find alternative ways of organising and working that will function effectively in this very different operating environment. Although there is intense debate and no clear agreement on an alternative course of development for a new and invigorated form of water management, 'collaboration' (both within and among organisations and groups) has been identified as an important guiding principle that would serve as a useful base value for re-structuring and reforming institutional arrangements for water management. The basis of this claim and theoretical arguments regarding the meaning and

development of collaboration in the context of water management are explored in the following section.

Collaboration Theory

Researchers from a variety of social science and management disciplines have shown significant interest in the concept of collaboration in the last two decades, and a substantial body of literature has emerged related to collaborative planning, management and problem-solving (see, for example: Gray, 1989; Mattesich and Monsey, 1992; Alter and Hage, 1993; Huxham 1996; Wondollek and Yaffee 2000). Nevertheless, surprisingly little agreement has emerged regarding the meaning and definition of 'collaboration' in operational terms. Many authors appear to use the term very broadly to describe a variety of situations in which organisations and groups interact for a variety of purposes. Consequently, terms such as 'co-operation', 'co-ordination', and 'co-management' have tended to be used interchangeably alongside 'collaboration', hindering efforts to develop clear understandings through theoretical and empirical work. Gray (1985: 912) did, however, provide the following definition of collaboration:

"By collaboration we mean: (1) the pooling of appreciation and/or tangible resources, e.g., information, money, labor etc., (2) by two or more stakeholders, (3) to solve a set of problems which neither can solve individually."

Collaborative Processes

Following from the above definition, 'collaboration' refers to a particular type of interaction whereby organisations and groups identify, and then work closely together towards, a recognised common objective or need. Conceptually, collaboration contrasts sharply with co-operative arrangement, in which a similar mix of actors may seek to assist each other in achieving their own separate objectives, or a co-ordinated arrangement whereby their policies, plans and projects are aligned to reduce conflict and duplication of effort or to fill gaps in delivery (Kanev et al., 2008). Collaboration emphasizes the need to create a deep and richly-joined type of relationship in which 'appreciations' that reflect different values, priorities and beliefs are exchanged in addition to sharing of managerial resources and functional knowledge. Overall, collaboration is a way of developing and implementing a single, sophisticated and potentially innovative response to a complex problem or situation which the organisations and groups involved do not believe is resolvable through the conventional routes that are open to them, such as hierarchical control mechanisms and markets. Others have drawn attention to the nature of key elements within collaborative processes. For example, Imperial (2005: 286) observed that:

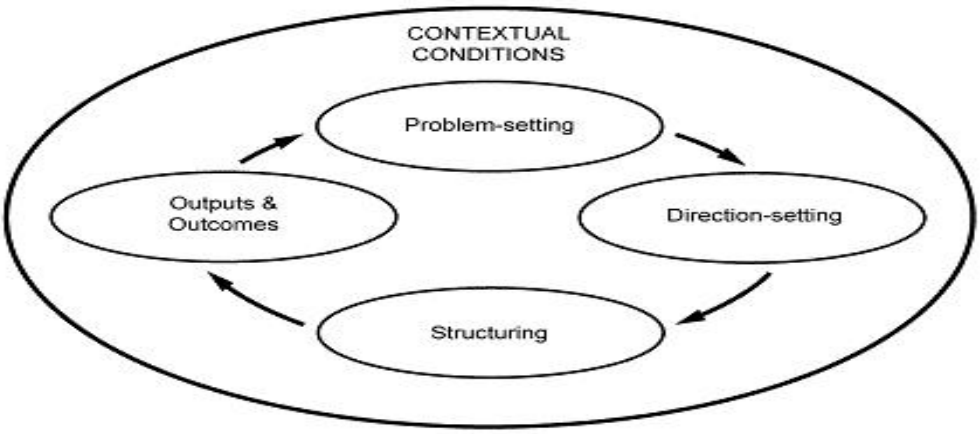
"…politics, bargaining, negotiation, and compromise become the critical control mechanisms because organizations remain relatively autonomous and must be convinced to work together because they cannot be forced to do so. Thus, exchange mechanisms tend to be social; to depend on communication,

relationships (personal and organizational), mutual interests, and reputation; and to be guided less by formal authority structures."

Thus, collaboration is a relatively fluid, self-organising and unpredictable type of process which can often result in each individual case developing its own specific traits, characteristics and operating rules according to contextual conditions and the attitudes and preferences of the participants. Developing theory and understanding of collaboration therefore presents significant challenges for analysts, since the specific forms of interaction among the collaborators are likely to vary both temporally and spatially in response to the type of issue or problem that is being addressed as well as the social norms and customs which the participants bring to the process. Nevertheless, several authors have argued that many collaborative initiatives do share some common features and this has led to the development of a generic process-based model (see for example, McCann, 1983; Selin and Chavez, 1995; Watson 2004). The model can be used either descriptively to analyse existing practices, or prescriptively to improve levels of collaboration or help with the design of a new initiative. Five key elements are identified within the model, and are inter-connected to represent an emergent and iterative process which evolves over time in response to changes in external conditions and the dynamics of the relationships among the collaborators (Figure 1). *Contextual conditions* create both the opportunities and constraints for collaborative working. For example, a crisis situation or critical environmental threat which cannot be adequately addressed through existing 'silo' or bureaucratic arrangements may prompt organisations and groups to seek collaboration with others. Similarly, legislation, administrative policy and/or the availability of funding and other resources may have the effect of encouraging collaboration among organisations and groups. Conversely, collaboration may be discouraged in situations where an organisation has sole accountability for decisions and has legal responsibilities which cannot easily be shared with others. The mix of incentives and obstacles for collaboration is likely to change over time, meaning that the process itself will be complex and could involve periods of rapid development, stand-still or even reversal. Understanding the historical and organisational context is also important because, as Roberts (2001:12) observed, participants often "fail into collaboration" as a consequence of learning from previous negative experiences with authoritative and competitive strategies which have not achieved the results or outcomes they desire. However, because prior experiences and incentives to collaborate are likely to vary among the potential participants, even initiating an alliance, partnership or other form of collaborative arrangement may prove extremely difficult. Overall, contextual conditions shape perceptions of the need to collaborate and, in practice, will influence whether a multi-party group is able to get to the table and progress beyond their first meeting.

Problem-setting refers to the processes whereby the participants share ideas, knowledge and beliefs to establish the identity of the problem(s) that confront them and the stakeholders who have legitimate interests in the problem domain. In the context of catchment management, questions are addressed related to the current state of natural resources, the effects of prevailing conditions, and the need for changes or improvements. It has been argued that reaching agreement on the nature of the problem is one of the most important steps in the process, and yet this phase of activity is often rushed because of the desire to solve problems quickly (Bardwell, 1991).

Figure 1: Process-based model of Collaboration



An incomplete understanding of the problem may lead to the development of partial solutions which merely address some of the symptoms rather than the underlying causes. Furthermore, the collaborative process will be slowed or may even de-railed in situations where the participants continue to advocate different explanations for the problem. *Direction-setting* is concerned with the establishment of agreement on legitimate super-ordinate goals or common 'ends'. To be deemed legitimate and to generate strong commitment, the goals should reflect the aspirations and interests of all of the collaborators and judged to be technically, economically and politically feasible. Many different tools and techniques have been developed to assist with this phase, including Future State Visioning and strategic planning scenarios. Nevertheless, establishing an effective long-term strategic direction for collaboration is likely to be challenging and will require both communication and negotiation in order to reconcile different understandings, values, beliefs and aspirations. *Structuring* refers to the process of establishing group structures, rules to guide decision making and other activities, and the allocation of roles and responsibilities. In effect, structuring provides the mechanism through which the collaborators are able to interact, evaluate their situation, make plans and create arrangements to implement agreed actions. According to McCann (1983), this phase is also often handled poorly, and the designers of partnerships and other collaborative arrangements often relying too heavily on bureaucratic management principles and structures so that control is vested in a small inner-circle of powerful actors who may not have the appropriate capabilities or skills, while other legitimate stakeholders are given weaker representation via sub-committees and consultative groups. Finally, *outputs* include the policies, plans, agreements, programmes and projects which the collaborators create to address the issues and concerns identified during the problem-setting phase. *Outcomes* refer to the actual changes in conditions which result from collaboration. While this could include improvements in environmental quality, other outcomes such as enhanced knowledge, reduced conflict, or more equitable, efficient or effective decision making may also be realised as a consequence of collaborative working. The creation of demonstrable outputs and realisation of significant outcomes are both important indicators of different types of 'success' which can be instrumental in sustaining long-term commitments to collaboration.

The preceding account indicates that collaboration is, by necessity, a 'messy' emergent process, and therefore the direction and structure of any particular initiative cannot be pre-determined or predicted. In reality, all five different elements represented in the framework are fluidly inter-connected. For example, improved understanding of the problem which emerges over time may prompt a change in direction or goals, or may require adjustments to the structure of the collaboration and/or the rules which it operates by. Similarly, the types of outputs and their effects in terms of creating significant outcomes may cause the collaborators to reflect on their understandings of the situation, to evaluate their progress and effectiveness, and to make appropriate changes to their problem statements, plans and operating arrangements. Similarly, contextual shifts related to change in the physical, economic, political or social environment may alter the need for collaborative working, the goals that are pursued and also the types of strategies that the collaborators strive to develop.

Network Power

While the generic process-based model described above emphasizes consensus-based decision making and action, other commentators have argued that collaboration is fundamentally about power. For example, Booher and Innes (2002:225) argued that collaboration is valuable to modern society because it creates additional intelligence in the form of a jointly-held resource which they referred to as 'network power':

"In the informational age, network power is what works most effectively. Network power is a shared ability of linked agents to alter their environment in ways advantageous to these agents individually and collectively. Network power emerges from communication and collaboration among individuals, public and private agencies, and businesses in society. Network power emerges as diverse participants in a network focus on a common task and develop shared meanings and common heuristics that guide their action. The power grows as these players identify and build on their interdependencies to create new potential. In the process, innovations and novel responses to environmental stress can emerge. These innovations in turn make possible adaptive change and constructive joint action."

While network power has always existed within society, it has become a much more important asset for social adaptation as it provides a means for collectively generating innovative ideas and widening the range of alternative views and options available to decision makers. Network power co-exists alongside the more conventional forms of political, economic and knowledge-based power that continue to be held by the individual actors and which may still be used to pursue separate rather than collective goals. However, in a collaborative setting, the conventional powers of the individual actors are marshalled and deployed jointly on the basis of rational choices which indicate that working together rather than competing or acting altruistically will best serve their self-interests. Booher and Innes (2002) contend that three basic conditions must be met for network power to develop and to be sustained over time: diversity, interdependence, and authentic dialogue (DIAD). Diversity refers to the actors and agents involved in the network and the importance of ensuring their knowledge, values, resources, and

experiences fully reflect the spectra of interests and concerns associated with the issue at hand. Interdependence points towards the need for all of the actors to fully appreciate that achieving their own goals and objectives depends as much upon the actions of others as is does on their own actions. Without this sense of reciprocity, whereby each actor is able to offer something of value to others in return for receiving something that is important to them, there is little incentive to collaborate. Authentic dialogue occurs when all of the actors are able to speak openly in an informed way so that others are able to listen, comprehend and take their ideas and concerns seriously. It is through this process of interaction and exchange that shared meanings emerge, opportunities for reciprocity are identified and creative solutions are developed. Conversely, inauthentic dialogue reduces network power because definitions and meanings of issues and problems are not fully developed, important actors with relevant interests and knowledge are consequently overlooked, and the extent of interdependency, shared predicament and common purpose is not fully appreciated by the potential collaborators who occupy the problem domain.

Social Learning

Learning is an additional element which many authors have identified as having a key role in collaboration and ecosystem-based management (for example, Daniels and Walker 1996; Allen et al., 2001; Armitage et al., 2008). Indeed, Huitema et al. (2009) use the term 'adaptive co-management' to emphasize the need for both experimental learning and strong links among government actors and civil society in order to manage complex socio-ecological systems. Although learning by individuals often involves some form of social interaction, Schusler et al. (2003) contend that 'social learning' occurs when people engage one another to share diverse perspectives and experiences in order to develop a common framework of understanding which forms a basis for joint action. Webler et al. (1995) identified two key components of social learning. First, 'cognitive enhancement' includes learning about personal values, beliefs and intentions and those of the other actors involved, in addition to acquiring technical knowledge. Cognitive enhancement therefore includes learning about the nature and state of the problem, possible solutions and their consequences, other peoples' interests, methods of effective communication, and learning to practice holistic or integrative thinking. Second, 'moral development' refers to the ability to make judgements about right and wrong, and includes developing a sense of respect and responsibility to oneself and others, taking on the perspective of others, enhancing moral reasoning and problem-solving skills, creating a sense of group solidarity, integrating new cognitive knowledge within our existing mental models, and learning how to interact with others. Pahl-Wostl and Hare (2004) elaborated on this final aspect of moral development, arguing that group involvement and interaction can lead to the generation of social capital and the transformation of relational practices, thus widening the range of policy options available, improving natural resource management outcomes and creating an enduring capacity for problem-solving.

Three different levels of learning have also been identified within both individual and group-based situations (Armitage et al. 2008). Single-loop learning is concerned with 'doing things better' by making

incremental improvements to established routines. Double-loop learning involves re-framing our understanding of a problem by adopting new perspectives and scrutinizing alternative accounts or explanations. Triple-loop learning entails transformations in understandings and practices as a consequence of shifts in underlying values and beliefs which set the context for defining and solving problems. According to theory, the learning process can evolve from one level to the next in circumstances where the participants judge outcomes of their earlier actions to be insufficient and they begin to recognise the need for deeper forms of inquiry. As learning progresses from one level to the next-highest level, moral development becomes progressively more important in addition to cognitive enhancement, as attention is focused on alternative perspectives, values and beliefs.

Whilst most of the literature is concerned with the role of social learning in supporting collaborative action and enabling adaptation, others have focused on the circumstances in which collaborative research involving state authorities and other stakeholders can contribute to social learning. As argued by Raadgever et al. (2012), collaborative research allows for exchanges, co-evolution, and joint construction of knowledge which can result in enriched decision-making, greater credibility and relevance of results, and improved relationships and trust among actors. In addition, collaborative research may also promote cognitive learning whereby the perspectives of the actors change, new knowledge about the system to be managed is gained and ideas regarding potential management responses and strategies are shared. Ultimately, the cognitive learning that is derived from collaborative research may help to align the perspectives of the actors, create consensus and bring about changes in values and beliefs. Raadgever et al. (2012) identified several general factors which can influence the development of cognitive learning, including the relevance of the research to the issue at stake, and the credibility and quality of the research and the researchers. The urgency of the public or policy issue and the subsequent demand for new knowledge was also identified as a significant factor, as was mutual trust and understanding among the researchers and other actors. Learning is also more likely when all of the actors have equal input to the research process, including definition of its purpose, the questions to be addressed and the methods to be used, the anticipated results and the form of dissemination or presentation. In addition, learning is promoted when the collaborative process is long-term, involves a sufficient number of substantial meetings, and allows for interaction and knowledge exchange among a small and tight-knit group of people who are willing to explore and critically reflect on research assumptions and uncertainties. Lastly, the authors suggest the potential for learning is influenced by focussing events such as natural disasters, political changes, announcements of radical new policies, and associated media coverage. However, their analysis of two case studies of flood and groundwater management in Germany revealed that only under specific conditions is learning enhanced through collaborative research. Those conditions included the establishment of an intense process in which all of the participants were able to contribute equally throughout, where they were all highly motivated to learn and find solutions, and were they were willing to devote the necessary time and resources to collaborative working. Obstacles which can hinder both collaboration and learning were also identified, including the limited influence of individual actors over the willingness of others to engage in the process, and political motives which may influence the conduct of the research and the possibility for open discussion.

Participation

Clearly, collaboration cannot occur without the participation of at least two actors with interests or stakes in the issue or problem that confronts them. Although the broad arguments for public participation in relation to the water environment are well rehearsed, the more specific and difficult questions regarding how participation in a collaborative catchment management process should be designed and how fair and effective participation can be realised have, until recently, received surprisingly little attention. Indeed, much of the research literature on public participation has focussed on the limitations and problems that are commonly associated with participatory processes, such as the predominance of powerful organised stakeholders who are able articulate and promote their interests and the under-representation of other groups with legitimate concerns but less power, influence and experience (Applegate, 1998). In addition, it has often been claimed that the organisers and sponsors of public participation are able to set the agenda and orchestrate knowledge exchange so that the outcomes are consistent with their own preferred solutions and interests. However, there is a growing body of research which seeks to move the debate beyond the analysis of problems and barriers by considering how and under what circumstances it may be possible to create meaningful participation among the publics, scientific communities, and governmental bodies who are all increasingly recognised as 'experts' in their own right (Falkenmark et al., 2004). Much of this recent literature points towards the importance of deliberation and continuous exchange of information and ideas in an open and inclusive process which commences long before any decision is due to be made. This is in sharp contrast to the far more typical one-way 'knowledge transfer' approach whereby participants are informed of an impending decision and given limited opportunities to react and influence that decision. For example, based on a review of experiences in the Great Lakes region, Konisky and Beierle (2001) found that innovative processes such as study circles, citizen juries, round tables and collaborative watershed management groups can offer advantages in terms of promoting deliberative dialogue, values-oriented discussion and education, and consensus-based decision making and conflict resolution. However, where entry criteria are used to select participants, some of these processes may actually exacerbate problems of poor representation in decision making. The authors concluded that:

"Overall, as stand-alone exercises, these innovative processes do not provide viable substitutes for more formal, government-orientated participatory processes. They may, however, represent particularly useful components of a larger, multi-phased effort". (:823).

In examining public participation in the context of IWRM and the European Union Water Framework Directive (WFD), Ker Rault and Jeffrey (2008) argued that new forms of water management will not be fostered by simply following the letter of the law. Rather, they contend that a learning approach is required in which a radical participation strategy is developed through trial and error experimentation, on-going monitoring and critical evaluation, and adaptation of the political and institutional frameworks which, at present, often constrain active involvement by both the public and organised stakeholders. Tsouvalis and Waterton (2012) have argued that it is important to build on the critique of participation

by experimenting with novel processes, such as a new forum called the Loweswater Care Project (LCP) which was created by a group of researchers and local residents to address water quality, land use and other related issues in a small catchment area in Cumbria, North West England. A number of key ideas and principles were developed by the LCP which helped to define its approach to catchment science, knowledge and expertise, and pragmatic intervention to improve local livelihoods and environmental conditions. Key among those ideas were: the development of a vibrant, heterogeneous and antagonistic group or 'collective'; openness to the exploration of alternative framings of issues and problems as they emerge at different times; critical awareness within the collective of its own methods and a willingness to adapt and experiment with alternative approaches; consideration of previously exclude factors which are connected and salient to the problems at hand; willingness to recognise the limits of different forms of knowledge and to work with, rather than trying to eliminate or ignore, environmental uncertainty and complexity; commitment to working collectively towards lasting solutions rather than remedies for the symptoms of problems.

Benefits, Doubts and Questions

Research from a wide range of disciplines has resulted in a body of theoretical knowledge pointing to the importance of collaboration as a strategy for responding to 'wicked' water problems. Numerous potential advantages of collaboration have been identified which may contribute to innovative problem-solving through purposive dialogue, social learning and adaptation within diverse and interdependent multi-party groups. Nevertheless, doubts and concerns remain regarding the legitimacy and accountability of ad hoc and non-elected collaborative groups, as well as their ability to include previously marginalised interests and communities. In addition, it has been noted that collaborative arrangements are often developed as an addition to, rather than a replacement for, established top-down procedures within government which raises further questions regarding the true extent of power-sharing and collective decision-making. Although there is a growing body of empirical research related to collaborative water management, there has been relatively little critical debate or analysis regarding what 'collaboration' actually means to those who are involved, or how different understandings of the concept influence the development of strategies and arrangements for different catchment areas. The analysis presented below seeks to address this gap in understanding by examining recent experiences of collaborative catchment management in England. In order to set the context for the analysis, the following section describes the background to government policy advocating a catchment-based approach.

Policy Context

On World Water Day, March 22, 2011, the Minister for the Natural Environment and Fisheries announced the launch of the UK Government's Catchment-Based Approach (CaBA) and explained that it would aim to:

'*provide a clear understanding of the issues in the catchment, involve local communities in decision making by sharing evidence, listening to their ideas, working out priorities for action and seeking to deliver integrated actions that address local issues in a cost effective way and protect local resources.'*

Although a comprehensive policy statement has not been produced by government to date, some of the fundamental ideas and principles associated with the catchment-based approach can be identified from Ministerial speeches and supporting documents produced by the Department for the Environment, Food and Rural Affairs (Defra) and the Environment Agency:

- Land and water are inseparable, and should be managed in an integrated way at the local level
- Catchment-scale management of land and water should be conducted in a co-ordinated and sustainable way to balance environmental, economic and social demands
- Relevant stakeholders should be involved in dialogue to develop a shared understanding of the problems in the catchment
- Effective management of land and water management requires many actors to work collaboratively, as issues cannot be solely undertaken by or be the responsibility of one organisation
- Other organisations may be better placed than government to undertake certain activities, such as engagement and facilitation
- Actions will emerge from a mutually agreed vision developed by all stakeholders and captured within a jointly owned catchment plan that will set out future aspirations and a road map for achieving them
- New sources of funding will be generated by engaging with those who will benefit from the actions outlined within the catchment plan
- Catchment management is a long term commitment that requires a flexible approach to adapt to changing circumstances and different local needs
- The catchment-based approach will help to meet water quality objectives established under the European Union (EU) Water Framework Directive
- In addition to water quality improvements, integrated actions may produce multiple benefits and efficiencies related to, for example, flood risk management and climate change adaptation.

The launch of the catchment-based approach followed some heavy criticism of the way in which the assessment and planning requirements of the EU Water Framework Directive (WFD) had been interpreted in England during the first cycle of implementation (2006-2015). In particular, because of a policy decision to adopt large River Basin Districts (RBDs) rather than smaller catchments as the main spatial units for planning and management purposes, the assessment of river conditions and engagement of the public in the exercise became problematic. Consequently, a coalition of environmental non-governmental organisations argued that public participation had been too limited and that water quality and ecological targets set for specific rivers were not sufficiently ambitious to meet the goals of the WFD, and threatened to seek a full judicial review of the RBD planning process. Some of these criticisms were accepted by government, and the catchment-based approach was subsequently introduced as a policy response to address these concerns. The catchment-based approach also aligned closely with the Coalition Government's 'Big Society' and localism agenda, which seeks to develop a stronger, more diverse, independent and fairer society through government-civil society partnerships.

Although catchment management is regarded by the UK government as a proven concept, there is also recognition that the collaborative approach is relatively new in a UK water management context and that there is considerable uncertainty regarding how it can work and what may be expected in terms of the delivery of outputs and outcomes. As such, a pilot scheme was established and operated between July 2011 and December 2012 to developed and test different approaches. This included ten catchment-management initiatives that were hosted by the Environment Agency and an additional fifteen that were hosted by other types of body such as rivers and wildlife trusts, urban regeneration organisations, water companies and local authorities. The core group of twenty-five catchment management pilot projects was supported by a national programme of learning events and an on-going evaluation process that was undertaken by the consultants working on behalf of government. However, this particular paper does not focus on the core group and instead is concerned with experiences in an additional thirty-seven catchments where various organisations had expressed interest and received seed-corn funding from government, even though they were not selected as pilot projects. The decision to focus on these additional catchment projects was based on a number of considerations. First, the hosts of the twenty-five catchment management pilots received a significant amount of support and guidance from central government, national-level Environment Agency staff and consultants and this may have strongly influenced their understandings and approaches to catchment management. Second, the host organisations for the pilot projects were already devoting time and resources to an evaluation exercise being undertaken by the consultants, and initial enquiries indicated that many would find it extremely difficult to participate in an additional piece of research at the same time. Third and most important, the additional forty-one catchment projects did not participate in the national learning programme offered to all of the pilot hosts or take part in the consultant's evaluation process. As such, they were not subject to the same kinds of external governmental and public agency influences as the core group of twenty-five and therefore can provide some valuable insights regarding how the catchment-based approach is understood and applied by independent local groups.

Research Approach and Methods

The catchment-based approach was still in the early stages of development at the time of this study and therefore it was felt that it was important to focus on how collaborative working was understood and how assembled knowledge influenced the organisational strategies adopted by emergent catchment management groups. In epistemological terms, the study adopted a social constructionist view of knowledge in which understandings of situations and tasks are fabricated by people according to their beliefs, social interactions and experiences. As such, the view was taken that that the actual meaning and practice of collaborative catchment management cannot be comprehended merely through objective observation but requires scrutiny of how ideas and actions are formulated. Conceptually, the study utilised 'problem-framing' as a device for examining how the task of developing collaborative catchment management was perceived by those involved in the process. As Bardwell (1991) explained, ideas, values and presumptions that are embodied within representations of problems or tasks have a profound effect on subsequent choices of problem-solving actions and strategies. As such, the definitions and meanings ascribed by actors to both 'collaboration' and 'catchment management' are of critical importance for understanding why particular strategies or solutions were selected and also for accounting for the overall impacts of the intervention.

Data for the study were collected using in-depth semi-structured interviews conducted with individuals who were acting as the leaders of twenty-one of the additional thirty-seven catchment-based initiatives. Although the accounts provided by the leaders may not be representative of all the opinions within their separate groups, their personal views and experiences were nevertheless considered to be extremely important and valuable for shedding light on how collaborative catchment management had been framed and approached. An interview guide comprising twenty-one open-ended questions was developed, tested via an interview with a leader of a catchment management group outside of the study group, and subsequently modified. Of the group of thirty-seven catchment management initiatives, twenty-five were selected in order to provide a substantial sample size that included a diverse mix of different types of host organisations, catchment conditions and geographical contexts. When contacted, potential participants were given the opportunity to participate in a recorded telephone interview or alternatively to complete a questionnaire which included the same questions as the interview guide. In total, twenty-one positive replies were received which produced fifteen interviews and six questionnaire responses, all of which were completed between September and December 2012. More than twenty hours of interview recordings were generated, which were independently transcribed prior to being analysed.

For the analysis, the framework described earlier in the report which includes five broad aspects of collaborative planning and management (context, problem-setting, direction-setting, structuring, and outputs and outcomes) was used. It is important to stress that the framework was used as a descriptive and analytical tool for sorting and analysing qualitative data according to broad and flexible themes, and not to prescribe or to provide evidence for a particular way of thinking about or practicing collaboration.

Analysis involved repeated reading each interview transcript and questionnaire response in order to identify important comments and arguments. Codes were then developed to identify key themes within the data and enable them to be related to one or more of the five elements represented in the analytical framework. Using this approach, the interpretations, strategies and experiences of the respondents were compared and generalizable findings were developed.

Understanding and experience of collaboration among organisations and groups is a sensitive topic for research, and this is particularly true when information is gathered from individuals who are directly involved in on-going practices and processes. In order to protect the interests of the participants, minimize risks and ensure ethical integrity, the following steps were taken. Potential participants were sent an information sheet outlining the purpose, proposed methods and dissemination plans for the study and, as such, the research was conducted on the basis of fully informed prior consent. The information sheet included an assurance of complete personal anonymity and also the omission of catchment names or other identifiable information from reports or other outputs arising from the study. Respondents who agreed to participate in an interview were sent copies of the guide which contained the list of questions at least two days prior to the interview taking place. In addition, participants received electronic copies of their interview recordings and were invited to review the content so that important details could be clarified and potentially sensitive or damaging statements could be removed. In practice, none of the interviewees requested changes to their interview recordings. Finally, the research proposal and all of the above arrangements received research ethics approval from the author's own academic institution before data collection began.

Research Findings: Understandings and Practices for Catchment Management

In this section, the key research findings are presented with reference to the conceptual/analytical framework described earlier in this report (Figure 1). Where appropriate, additional links between the findings and important themes and ideas found within the literature on collaboration, such as the nature and role of power, learning and participation, are also explored.

Contextual conditions

Research participants were invited to comment on the circumstances which had led to their organisations becoming a host for a catchment-based initiative. In almost every case, participants highlighted the availability of new funding to support catchment management as a significant factor. Several participants explained that their organisations were registered charities which lacked core funding, and had therefore become very skilled at identifying new sources of funds to support individual projects that could deliver actions and improvements that were consistent with their existing aims and objectives. For example, one interviewee stated:

"I've been in this game a long time and I know how it works. Funding does disappear…that's why it's good to keep it tightly focussed and then expand it out when you can see that new money is going to be available."

Another interviewee explained:

"We have been working in the catchment for fifteen years and really what has determined more than anything what we have done has been what funding has been available. We're a registered charity, not a commercial organisation. It's only recently that there has been any money available for work in England compared to the catchment area in Wales, where it has been a lot easier."

Furthermore, many of the participants felt that the provision in 2011 of £28 million in public funding for catchment management was an indication of a major potential future shift in government policy priorities and that it was important for their organisation to get behind the initiative and position itself to take advantage of future funding opportunities. At the same time, concerns were expressed regarding the lack of a firm policy commitment by government to the catchment-based approach and uncertainties regarding future funding which, it was argued, made it difficult to 'sell' the idea and to engage other organisations and groups in collaborative work. In particular, interviewees were worried about the risk of damaging rather than improving relationships with other stakeholders by persuading them to join collaborative catchment groups and building up high expectations that ultimately may not be achievable due to lack of funding and organisational resources.

Whilst funding and uncertainties regarding government policy were key influences that affected all of the initiatives in the sample, it was also evident that local circumstances and conditions played a significant role in the development of individual catchment management initiatives. For example, a number of interviewees described how they felt their catchment area had been overlooked and had not received sufficient attention from resource management agencies during previous initiatives, including the first cycle of WFD implementation. This appeared to be a particular problem in relatively small catchment areas that were adjacent to other, typically larger, catchments that had received much more intensive environmental monitoring and management attention because of their perceived importance to the local and regional economy as well as the natural environment. Typical comments from interviewees included the following:

"If you look at the geography, the next catchment you drop in to is a very high priority for the agencies. It's a part of the world that everybody knows and it has got some serious problems. We were very conscious of the fact that our catchment was essentially being ignored although it has some serious issues which were just not getting any attention. Our concern is that there is a big element in the WFD regarding non-deterioration of water bodies that isn't being addressed by the agencies.

"This area is a mess and it falls in a huge black hole where there isn't much funding input or interest. It falls between Catchment-Sensitive Farming Areas, so it's not in any of these. The whole thing is fairly cut-off and we felt neglected in every sense of the word."

In these kinds of situations, interviewees believed their organisations had chosen to participate in the programme of catchment-based initiatives because it provided a new opportunity to draw attention to local-scale issues and concerns and to potentially correct some of the imbalances that were perceived to exist in the allocation of the technical, administrative and managerial resources held by key agencies and other actors.

Interviewees also commented on the importance of land ownership structures within their catchment, which in some cases had produced a historic pattern of fragmented and piecemeal efforts to tackle isolated problems, rather than actions aimed at managing the whole catchment as a system. Some interviewees reported that businesses that owned large sections of the catchment had generally shown little interest in the past in working with others to tackle issues related the water environment. In contrast, others felt that in their experience both private landowners and public organisations such as local authorities which owned local environmental assets such as nature reserves had been instrumental in promoting catchment-scale thinking and collaborative action. Both perspectives are illustrated in the following quotation:

"The local authority is very supportive. It is significant landowner and they are really keen on anything that will help them improve their sites. Getting buy-in from the predominantly private landowners in the more rural parts has been slower and more difficult…they are interested in the broad catchment landscape but not that worried about the detailed in-stream issues."

In addition, the host organisations themselves played significant roles in shaping contextual conditions and defining the scope of the catchment-based approach within their area. In all but one case, the host organisation had been in existence for several years and had developed environmental objectives and programmes that reflected a particular set of concerns and priorities related to both water and land at a variety of spatial scales, ranging from individual sites and stretches of river to areas that included parts of more than one catchment. For example, several of the hosts are wildlife and biodiversity conservation organisations with responsibilities for nature reserves, wetlands and other types of environment. In other cases, host organisations have remits to protect and improve water quality and the river habitat in order to support angling and fishing. In some of the more heavily urbanised areas, the host organisations were created to promote public awareness, access and enjoyment of the natural environment. Not surprisingly, given the funding and policy uncertainties and power relationships discussed previously, many of the host organisations have chosen to interpret and tailor the government's new policy in ways which fit their own pre-existing aims, rather than adapting their own organisation and re-orienting their activities to meet the stated objectives of the catchment-based approach. For example, an interviewee representing a wildlife conservation organisation said:

"On its route the river is canalised and has been heavily modified over the years and has lots of urban and agricultural diffuse pollution issues. We manage a nature reserve and a mosaic of Sites of Special Scientific Interest (SSSI) within the catchment…so we do have some significant land holdings that are affected and could benefit if we can make improvements to water quality."

However, two interviewees stated that their organisations had made a deliberate attempt to develop a whole-of-the-catchment philosophy and approach and not to impose a particular set of priorities or objectives on the process at the outset. It is significant that one of these two organisations had been specifically created in response to the launch of the catchment-based approach in 2011, whilst the other host organisation had received support and guidance from a national environmental NGO that had extensive experience of collaborative catchment planning and management.

Overall, contextual conditions have influenced the initial development of the catchment-based approach in a variety of ways. The government's policy outlines broad goals and principles and, by not prescribing a particular organisational approach, provides potential opportunities for innovation and the development of collaborative arrangements for catchment planning and management. Nevertheless, uncertainties regarding funding and future policy have resulted in a generally cautious response from most host organisations which have used it as an opportunity to draw attention to issues and problems which they consider to be very important but have previously had been regarded by other actors and management agencies as much lower priorities and consequently had fallen into 'policy gaps'. Power relations among land owners and other key actors were also found to be important in creating and also limiting opportunities for collaboration and management intervention, as were the pre-existing objectives and priorities of the host organisations. Although there were a few exceptions, generally the catchment-based approach appears to have been interpreted quite narrowly by host organisations as a 'management tool' to be used to deliver specific environmental improvements alongside other on-going projects rather than a broad strategic and organisational framework designed to support collaborative appraisal, planning and management of whole catchment systems.

Problem setting

The research participants were asked to describe the issues and problems that were considered to be most significant within their catchment. Initially, catchment problems were described in the majority of cases in terms of loss of habitat and biodiversity related to poor water quality and failures to meet standards established through the WFD process. A typical comment is as follows:

"It is a small river that is very heavily modified and trashed, basically. There is a long history of people trying to improve things and the Environment Agency, under their WFD work, have a keen eye on it because it is failing in virtually every respect. The core purpose is to achieve improvements under the WFD."

As such, problems were often framed quite narrowly in relation to matters of environmental quality rather than in terms of ecosystem functions or human uses of catchment resources such as water supply, waste water disposal, navigation, flood control, farming or other types of land-use and land management activity. However, several participants did elaborate and comment on other inter-related policy and institutional difficulties that they believed had either contributed to environmental problems

or made them more difficult to address. For instance, one interviewee commented on the challenge of adapting to changes in policy frameworks:

"For the last decade, we have been working within the framework of a biodiversity action plan but now that process seems to have been demolished, certainly at the national level. With the WFD, there is now a move more towards water quality issues and whilst these don't necessarily conflict with biodiversity conservation, we needed to make sure that biodiversity is part of the discussion and then becomes part of the catchment plan."

Other interviewees suggested approaches developed and applied in the past to improve water quality and manage the catchment had contributed to current problems:

"Previous responses to pollution in the catchment have basically involved big engineering and sediment extraction solutions that were very costly and difficult. Our aim now is to come up with more low-key and sustainable solutions."

"*It's water-stressed to say the least. The most challenging thing is water quantity due to over-abstraction. That has created huge tensions with users groups and local communities because they've been banging their head against a brick wall for years trying to get it reduced but it just isn't happening."*

"In the past there have been lots of disparate initiatives and little groups in outlying areas, but none of it has ever come together."

Others drew attention to the ways in which they felt locally important issues and concerns had been misrepresented or missed entirely by previous planning exercises and management initiatives:

"*Some of the earlier plans we thought were excellent…great pieces of work, great plans but they didn't deliver anything."*

"We looked at the first plan they produced for the WFD and felt a lot of the classifications were very optimistic and an awful lot of them weren't based on any data…the assumption was that where the water quality was good downstream it must be good upstream as well. We felt it just didn't recognise the actual impacts related to abstraction and water quality."

"There have been innumerable studies carried out by the Agency and others in the past and there have been lots of plans covering the area…but they've acknowledged to us that working with local communities hasn't been their strong point…they've always had a top-down approach."

In contrast, several interviewees stated that their planning and management initiative was focussing heavily on water quality problems and damage to fish habitat caused by land use and land management practices within the catchment area. For example:

"The fields have sunk seven feet in seven years and the rate of soil loss in the catchment is astounding. There are no places where there is a natural river bed…it's just sediment moving along the bottom

overtopped by deeply coloured and heavily nitrified water…it fails almost every WFD criteria you care to put to it"

Another interviewee explained that the local authority s/he represented had ultimately decided not to go ahead with hosting a catchment-based initiative, despite submitting an application and receiving an offer of funding. The authority was concerned about a particular stretch of degraded river within its area but had concluded that the desired improvements did not warrant a catchment-scale approach. In addition, the interviewee explained that the authority had also turned down the offer of funding because it lacked the additional human, administrative and technical resources that were felt to be necessary effectively host a catchment-scale collaborative initiative. This example is significant, as it shows that the catchment-based approach it not always perceived to be relevant or viable at the local scale.

The research findings clearly show how catchment management problems have been set and prioritised in a variety of different ways. The adopted problem frames not only reflect the variety of physical characteristics and conditions within individual catchment areas, but also shed light on the power and influence of the host organisations in focussing attention on selected concerns and setting priorities which are compatible with their own objectives. Given that many of the host organisations have established aims and pre-existing work programmes related to areas such as nature conservation, habitat improvement and fisheries management, it is not surprising that problems directly related to poor environmental quality feature so strongly in their interpretations and applications of the catchment-based approach. Furthermore, the financial and policy uncertainty associated with the catchment-based approach appears to have discouraged hosts from developing broader management initiatives that extend beyond their own immediate environmental concerns and priorities. However, the limitations of established institutional arrangements, including those related to implementation of the WFD, are perceived to be important parts of the overall problem of managing catchments. Specifically, poor policy co-ordination, inadequate data, inaccurate appraisal of conditions, unfair prioritisation of individual catchments, authoritative styles of decision making and limited opportunities for public participation were all identified as significant obstacles that needed to be addressed via the development of a more collaborative approach to catchment management, albeit within the context of quite narrow ranges of local environmental concerns. Nevertheless, some potential hosts have rejected the catchment-based approach on the grounds that neither catchment-scale intervention nor collaborative responses are considered to be appropriate for the kinds of water-related problems their organisation is faced with or viable given the resources that are available.

Direction setting

Participants were invited to comment on the direction that their catchment-based initiative was taking and the procedure that had been used to identify legitimate goals and objectives. It is significant, although not surprising given that the initiatives are in the early stages of development, that objectives

were often described in terms of specific improvements to water quality and river flow needed to protect or improve particular sites or catchment assets rather than broader super-ordinate goals related to the use and long-term sustainability of land, water and other catchment resources. In part, the setting of quite specific operational objectives reflects the ways in which the host organisations and other participants have similarly framed catchment-related problems quite narrowly according to their own particular interests, understandings and needs. However, the focus on very specific problems and symptoms may also be an indication that the hosts and groups have not yet reached the stage in the social learning process where the inter-connections among the different elements and uses of the catchment system are sufficiently understood or appreciated for long-term strategic goals to be clearly articulated. Equally, it has to be recognised that some of the groups may not perceive the setting of a long-term direction and objectives to be necessary at all, as the catchment-based approach was viewed by some of the participants as an additional time-limited 'project' that could be used to support on-going work rather than a major new policy initiative that demanded sustained strategic commitment and new organisational development.

Individually, each of the catchment-based initiatives had developed its own procedure or process for establishing direction and setting objectives. Nevertheless, there were some strong similarities among the accounts provided by the participants which enabled four distinct approaches to be identified. First, in some cases it was felt that available data were accurate, evidence regarding the state of the catchment was complete and that the critical problems were known and well-understood. In these situations, the direction that needed to be taken was considered to be very clear and there was little perceived value or need for further catchment appraisal or planning activity. This version of direction-setting is illustrated by the following statement made by one participant:

"Certainly everybody agrees that invasive species are the number one concern and that is where we have focussed our work. Everyone is really enthusiastic at the first meeting, and if you don't do something straight away they just drift away. So it was a great time for us to say we have identified invasive specifies and surveyed the whole river so folks can get involved and start pulling the stuff up."

Second, examples were given where reliable information and evidence regarding the catchment was believed to be available, but scattered among many different plans and documents produced at different times by various organisations for a variety of purposes. As such, direction-setting involved gathering existing information to produce a single re-appraisal of the catchment and seeking confirmation from relevant actors that important problems and priorities for action had been accurately identified. This approach was described as follows by one participant:

"We pulled all the existing plans together and took them to different groups of people to ask if the aims and actions were still valid. Nearly all the issues were, but new ones were added as well."

In contrast, a third approach was identified whereby the host organisation considered available data to be unreliable and understanding of catchment conditions to be too weak to be able to set aims and objectives. In these situations, completely new appraisals of catchment conditions and problems were

undertaken by the host organisations themselves in order to highlight concerns and necessary actions often *prior to* engaging other organisations and groups in catchment planning and management activity. Although this approach could be criticised on the grounds that the hosts were potentially framing problems and setting directions according to their own terms rather than acting collaboratively, some participants argued that this was still valid:

"We did our own catchment appraisals and detailed assessments including catchment walkovers with the Environment Agency. We felt it was really important to have a good understanding of the issues and priorities within the catchment before we started to attempt to do things and engage people."

In a fourth approach, the host organisations took the view that their role was to facilitate the direction-setting process by engaging relevant organisations and groups in open planning, rather than determining the direction of catchment management themselves. In effect, the host's own assumptions, beliefs and priorities regarding the state and future management of the catchment were suspended in order to allow information and evidence to be assembled collaboratively. By adopting this more flexible and transparent approach, it was argued that more open deliberation could be achieved that could potentially lead to joint commitments to collective goals and objectives for catchment management. For example, one participant explained that:

"Our role is predominantly providing facilitation and co-ordination because in the past assessments and planning projects have been done on a piece-by-piece basis and there hasn't been one co-ordinated look at the whole river. It's very much about bringing all the information from landowners, parishes and groups together to identify priorities that will result in an action plan."

The findings indicate that although some form of direction-setting has occurred in almost all of the catchment management initiatives surveyed, to date the majority of goals and objectives have been framed quite narrowly around nature conservation and ecological concerns, often at particular locations or sites which are deemed to be important or under threat by the host organisations and other actors within their established networks. Given the short length of time that the initiatives have been operating, it is not perhaps surprising that the majority of groups have concentrated their efforts on operational-level issues and problems within the context of established environmental quality priorities, rather than developing new and longer-term strategic goals regarding the use and management of land, water and other catchment resources. At the same time, without the development of broader catchment-wide strategic goals, there is a risk that the catchment-based approach will be perceived and used as a tool to support nature conservation and ecological improvements rather than as more comprehensive framework for resource management and protection. Direction-setting activities also revealed some contrasting approaches to learning and participation that reflect the different attitudes of the host organisations towards power-sharing and the production of knowledge. In some cases, little emphasis was placed by the host organisation on additional learning about conditions within the catchment or stakeholder participation in direction-setting because problems were judged to be clearly understood and required actions were assumed to be already known and therefore unlikely to provoke controversy. As such, the host organisation remained firmly in control of the direction-setting process

and was able to engage actors who shared their concerns and interests. In other instances, however, there was explicit recognition of gaps in knowledge and uncertainties and therefore the importance of sharing power and responsibility for gathering information, identifying necessary responses to catchment problems and agreeing goals and objectives. In a few isolated examples, the host organisation adopted the role of an impartial facilitator so that goals and objectives were established collectively by the members of the catchment group rather than being imposed or assumed.

Structuring

Participants were asked to comment on the role of collaboration within their catchment management initiative and to describe the institutional and administrative structures that had been created to enable organisations and groups to work together. There was universal agreement that collaboration was of critical importance because of the multitude of actors and the complexity of existing institutional arrangements related to land, water and environmental protection. Typical comments included the following:

"We can't do things in this catchment without collaborating with others. It is just the nature of land ownership, the regulatory framework and the range of stakeholders who have an interest in the rivers. For many of us, we don't have the ability to just decide and deliver. We have to work collaboratively to get things done…we need to talk to and convince people and to secure resources."

"We have always had quite a collaborative way of working anyway…working with communities, local authorities and parish councils. So we have just extended that to try to get a series of actions that people are willing to contribute towards."

"There is a surprisingly high number of landowners given that it is such as small catchment…from two hundred acres to a few hundred hectares under single ownership, so there is an automatic need to be collaborative. You can work with an individual landowner to get improvements but you also have to work with the neighbours to reassure them they aren't going to be affected."

"In one catchment, there is a long standing commitment to develop a regional park authority and therefore catchment planning will have to be linked to that. A different model will be needed in the other catchments though."

At the same time, it became clear that informal rather than formal structures and arrangements for decision making were being used in most cases. Some participants felt this was simply due to their catchment-based initiative being in its infancy and the consequent need to raise awareness and build inter-organisational relationships prior to establishing formal rules and structures at a later stage. However, others questioned whether formal structures could ever be viable given that the catchment-based approach is founded entirely on voluntary participation and that there is no legal or regulatory requirement for public and private organisations to become involved or to collaborate with other

catchment stakeholders. In practice, rather than attempting to establish an 'entity' such as a catchment management council or committee, steering groups had been created for many of the catchment-based initiatives that included representatives for organisations that were already known to the host and were therefore parts of their established networks. For example, one interviewee stated:

"We contacted all of our existing partners that we knew were managing land or had influence on the catchment…the usual players really."

However, for a variety of reasons, it had not yet been possible to form a steering group in some cases. Some participants argued that environmental networks were poorly developed in the local area and therefore additional time and resources were required to be able to identify potential participants and to gain their interest and support for a catchment-based initiative. In contrast, others stated that the policy landscape was 'densely packed' with other initiatives which were fully established, comparatively well-resourced, actively supported by local actors and interests, and in some cases backed by legislation or regulatory requirements. As such, some of the host organisations were acting as policy advocates, operating within pre-existing powerful networks and negotiating directly with other actors in order to find a local niche and demand for a catchment-based initiative.

In the cases where it had been possible to establish a steering group, a number of different activities or functions were being undertaken. Most often, steering groups were used as the main mechanism for exchanging data and information and developing a collective understanding of the state of knowledge regarding issues and problems within the catchment. At the same time, some of the research participants acknowledged that their steering group was not fully representative of all the interests and resource users within the catchment area and that the membership, and therefore the information being exchanged, tended to be oriented towards water ecology and associated environmental concerns. Some steering groups had, however, been able to progress beyond the initial stage of sharing information internally. This particularly appeared to be the case when the steering group was founded on established and trusted inter-organisational relationships. For example, an interviewee commented on how the members of one steering group had compared their various organisational aims and objectives as a step towards the creation of a joint catchment management plan:

"We got everybody sat around the table and our initial priority was to map all of the catchment priorities and existing projects that we could tap into for future funding or enhance through some collective partnership working. We've had about five steering group meetings where we have talked about our different aims and priorities and where people are working in the catchment. All this information has been fed into a big master map and we have gone through four of five versions to show the whole catchment and highlight reasons for WFD failures."

In addition to developing joint understanding and internal cohesion, some of the steering groups were actively working to expand the community interested in their catchment by using the professional and social networks of the individual members. For example, one interviewee described how individual

steering group members had visited local landowners in order to raise awareness of the poor state of the river and to encourage them to become involved in the catchment management initiative:

"We've got a core group of about twelve who meet once a month and they have gone out to different parts of the catchment…a bit like having disciples really. Different people have said they know someone and have gone out to see if they would like to have a chat. Then we have gone out and talked to them in small groups or just one-to-one and actually got some practical work started on the ground. It's worked a bit like a snowball."

Different experiences were reported by the research participants regarding their efforts to engage large organisations such as local authorities and water companies in their catchment-based initiative. In cases where the local authority had clear responsibilities for assets that were affected by the water environment, such as parks, nature reserves and other designated areas, participants said they had received good support from technical officers. Others reported that gaining interest from local authorities at the policy and political levels had been more difficult, in part because the catchment-based approach was not widely perceived to be directly relevant to their statutory duties and responsibilities, particularly following the privatisation of water services in 1989, and also due to reductions in budgets resulting from cuts in public expenditure and economic recession. For example, one interviewee commented:

"In general terms, the local authorities are supportive if they think it will directly benefit their patch. But they are just under-resourced and over-stretched, and can't bring much to the table. Local authorities can be quite monolithic, but individuals with drive and some autonomy can do an awful lot of good. We find those people and try to work with them."

A perhaps surprising finding concerns the apparently low level of interest shown by water service companies in the catchment-based initiatives, given they have statutory responsibilities and commercial interests in the supply of clean water and treatment and disposal of waste water throughout England and Wales. When questioned about this, several participants said that they believed that the water companies should be involved because they are significant water users and their activities can affect both the quantity and quality of water in the catchment areas. However, a range of explanations were given to account for their lack of interest and involvement to date. For example, it was pointed out that the companies only obtain water from a limited number of surface water areas and ground water zones and therefore are unlikely to attach much strategic importance to the protection or management of catchment areas which they do not depend on for the supply of their water assets. Furthermore, it was suggested that other recent policy initiatives such as the designation of Water Safeguard Zones were more likely to be perceived as being relevant to the core business interests of the water companies compared to the catchment-based approach. In addition, several participants stated that all of the water companies operate within an established framework of financial and environmental regulation which determines their investment decisions. As a result, they felt that the water companies would find it difficult to justify expenditure and to use organisational resources for any catchment-based activity that could not be shown to directly benefit their customers or satisfy regulatory requirements.

Several participants also revealed that while their own organisations were the designated official hosts for the catchment-based initiatives, in practice the Environment Agency was closely involved. In a number of cases, an Environment Agency staff member had been appointed as a Catchment Officer or Co-ordinator and it was frequently stated that they had been very helpful in providing information and support. It also became clear that, in some instances, the Agency was able to use this arrangement to influence the direction of the steering group. For example, one interviewee stated:

"We are the hosts and organise the meetings and set the agenda. We do it very much talking to the catchment co-ordinator within the EA. So we are very central to the process, but if the EA wants something on the agenda, it goes on the agenda."

Conversely, some people felt that the presence of the EA on the steering group made it difficult at times to address long-standing issues and controversies where the EA had regulatory powers or had become involved in disputes with other interests in the catchment. For example, one interviewee commented:

"Some groups are anxious about putting things on the agenda because they know it is contentious and that the EA will be there. There is still this attitude of 'oh, it's the EA and we can't be seen to criticise them'. But that is the whole point of this process, isn't it? There is a long history of conflict and it is about trying to move forward together rather than us versus them."

Participants were also asked to comment on the degree of public involvement in their catchment-based initiatives in addition to specific stakeholders via the steering groups, and responses varied according to the type of collaborative structure and process that was being developed. In some cases, involvement of the wider public was seen as an important long-term ambition that would be needed at some point in the future in order to implement some of the actions identified by the steering group and subsequently included in draft catchment plans. In other examples, where there was less interest in catchment-scale planning and more concern about the condition of the river and surrounding landscape, local public meetings had already been held in order to recruit volunteers to take part in clean-up activities and on-the-ground improvement work. Several people commented on the valuable skills and resources that individual members of the public had brought to the process via their participation in local groups and organisations that were either represented on the steering group or otherwise closely involved in the initiative. For example, an interviewee observed that:

"For the catchment-based approach, we have an incredible local population here. A lot of them are really well-informed, intelligent and skilled and have run big public and private organisations before. They grasp the idea of the catchment approach and you can never under-estimate them."

In summary, collaboration was regarded almost universally as an important and necessary feature of catchment-based management initiatives. However, individual catchment management groups were at very different stages of development according to their prior history of collaborative work, and many were still identifying, and establishing relationships with, relevant partners. A key challenge for many of the groups it to find a niche or place for a catchment-based initiative in a complex institutional landscape where powerful actors are already committed to other on-going policy initiatives. As such, the

host organisations have tended to follow a pragmatic and opportunistic approach to collaboration in which their established networks are used as the basis for the creation of quite informal steering groups, rather than formal inter-organisational structures and decision rules. Steering groups are being used as effective mechanisms for exchanging information, learning and identifying common objectives, as well as expanding networks and creating larger communities of interest. One advantage of this approach is that the organisational risks to the host and the other participants are reduced, particularly given the uncertainty that exists regarding future government policy and the likelihood of additional funding to support catchment management. A disadvantage is that the steering groups do not necessarily provide balanced representation of the full range of actors with interests in the management of land, water and other resources within each catchment area. The lack of diversity in views and interests that are represented via the steering groups has the effect of reinforcing the quite narrow framings of catchment issues and problems that already underpin many of the initiatives. The host organisations face a number of other significant challenges, including finding support and a niche for a catchment-based initiative when key actors are already committed to other projects with similar objectives. Catchment-scale management is not always a viable approach to resource management for some organisations such as local authorities and water companies, even though they may have direct interests in the use and protection of land and water. The involvement of the Environment Agency is also a significant factor. The EA is recognised as a valuable source of information and support for catchment-based work. However, the EA is a stakeholder in its own right because of its responsibilities for environmental regulation and implementation of the WFD, and is well-positioned to influence the steering groups and the direction taken in each of the catchment-based initiatives. In some catchments, there is a history of conflict between the EA and other resource users, and this may constrain dialogue within the steering groups and limit opportunities for collaboration. Host organisations recognise public involvement as an important aspect of catchment management. Where action is being taken at an operational level, it has been possible to engage members of the public quite quickly to deliver on-the-ground improvements. In other cases, where the current emphasis is towards strategic catchment planning and management, there has been relatively little public engagement because steering groups are less clear and confident about their own long-term aims and priorities.

Outputs and Outcomes

When invited to comment on achievements and future aspirations for their catchment-based initiative, participants provided a wide range of responses. Overall 'success' was typically described in terms of the delivery of tangible improvements in water quality and quantity that would benefit river habitat and ecology, rather than in terms of more sustainable resource use or the development of more effective catchment management arrangements. However, it became clear that the host organisations were often operating in varied circumstances which meant that collaborative catchment management was being developed in different contexts and from a range of very different starting points. For example, in cases where there had been little or no prior attempt at collaborative management of any resources within the catchment, identifying and making contact with potential partners was perceived to be a very

significant step forward or achievement in its own right. In other situations, where networks and strong working relationships already existed, participants were able to point towards the creation of a steering group, sharing of data and information, new or updated catchment appraisals, and joint learning about organisational priorities and projects as significant accomplishments. In a few cases, the host organisation had intentionally focused the initiative on a known problem, such as invasive plant species, and therefore those participants were able to describe achievements in terms of very specific actions which they believed had resulted in physical improvements to the water environment and river corridor. In their view, it was important to get practical action underway as quickly as possible in order to convince the participants that the catchment-based initiative was not just a 'planning exercise' or a 'discussion forum' that would not lead to any significant environmental outcomes. Typical comments included the following:

"We will have identified those groups that are prepared to make a contribution and those who will still need to be persuaded. Because we already have links with some groups, and the Environment Agency has identified some additional funding, we can go out with those groups and do some practical work."

"We have tried to get a group of people together which is reasonably balanced around the table with interests and skills that represent how we see the problems. That's been quite successful…but we haven't finished any projects yet so to that extent we still have not got anything concrete to show for our efforts."

"For us, success is getting a strong consensus about the key issues, agreement on the general sorts of actions that are required and demonstrating that we speak on behalf of a relatively large number of the local population who want the river to improve."

"We will have a draft action plan ready, but really it will be a baseline assessment of the catchment…just the start. I wouldn't say by any means that we will have a fully-fledged action plan but it takes a long time to get some of the stakeholders on-board."

"I don't know whether it is achievable, but our aim is to produce a report at the end of the year that describes all of the engagement work that has been done by ourselves and partners such as the park authority and sets out a joint understanding of what the problems are and how we would go about producing a catchment plan. In other words, a road map but not at the level of detail required for a proper catchment plan."

"There's a catchment plan already that has existed for a couple of years. By December, we are hoping to have got through stage three, which is actually a consultation process on management options.

As such, descriptions of desired outputs and outcomes appear to reflect understandings of local circumstances, prior histories of catchment planning and partnership working, and pragmatic assessments of the host organisations regarding what can be realistically achieved with limited resources and time. Whilst many participants were quite optimistic about what could be achieved in terms of site-specific ecological improvements by implementing the catchment-based approach, they

also expressed concerns about the influence of local groups on resource management decisions and the potentially limited impact of catchment plans on future water and land management policies. In particular, several participants felt that the link between the catchment-based approach and the larger-scale river basin district planning process was unclear and that locally important issues and priorities might be overlooked when the next round of plans for river basin districts were created by the Environment Agency. Indeed, some participants believed that Environment Agency had not adapted its own administrative structures and procedures sufficiently for planning and management at the catchment and river basin district scales to be integrated effectively:

"There seems to be some sort of disconnection within the Agency. The question for us is how we are going to feed all of this local information into the River Basin District Plan and ensure the Liaison Panel listens to the concerns. The catchments are all different and the District is just too big."

"*We have been looking to the Agency for some support and guidance, but I don't think they have been that clear themselves. Their response has been 'it's up to you to produce a catchment plan – we are here just to facilitate'. But what's the point of us suggesting something if the Agency is just going to ignore it or won't allow us to do that?"*

In addition, some participants were concerned about the potential damage to organisational reputations and loss of hard-earned collaborative capital if locally-produced catchment plans were ignored or if government support for the catchment-based approach did not continue:

"There doesn't seem to be a clear policy on how the plans themselves will be taken forward or any indication of future funding. We are raising all these expectations and people are generating all these fantastic ideas for projects, but the plan will produced and what happens next? People will be really angry and frustrated if it isn't taken forward after all the time and effort that has gone into the plan."

Furthermore, some participants had strong reservations regarding long-term benefits of the catchment-based approach. Specifically, some believed that the most significant and intractable catchment problems were the often the consequences of policy processes that were simply too large, powerful and entrenched to be influenced by local voluntary action and non-legislated initiatives such as the catchment-based approach. For example, some were very sceptical about the difference that could be made by a 'soft' collaborative catchment management initiative when faced with water quality and quantity problems that were either the direct or indirect results of farming, urban development and water supply policies. Three participants from different parts of the country observed:

"Diffuse pollution is our biggest problem but you are going into the realms of food production, agricultural policy and farm economics. You see statements about 'working together' and government is hoping that suddenly everyone is going to get up and sort out some of the urban and agricultural problems. People want clean rivers but most of the solutions lie with quite focussed delivery agents. I think they have lost the plot on that with the catchment-based approach"

We are dealing with organisations that have been involved in plan-making for many years and there is an element of consultation fatigue. There's a feeling of 'here we go, another strategy coming in to place'. So even just getting people around the table is a challenge because they are all busy and just think it is yet another plan that's intended to meet somebody else's requirements."

"There is a lot of effort going into these plans from local people. We can do habitat-related things and improve rivers that still have water in them. But there has to be a deal… they are doing what they can but government and the EA have to do their bit to make sure there is actually enough water in the rivers."

Overall, the findings indicate that changes in environmental quality, such as site-specific improvements in water ecology, are often regarded by the hosts as the most important potential outcomes of collaborative catchment management. This is not surprising, given that many of the host organisations have been actively involved in river habitat management and nature conservation work for many years and are able to draw on their established networks to recruit partners with similar interests and concerns. However, the outputs from the individual initiatives are linked to local circumstances and are contingent upon the strength of existing relationships among organisations and local groups which effectively define different 'starting-points' for collaborative catchment management. In some cases, it has been possible to deliver tangible on-the-ground actions quite quickly, whereas in other situations efforts have focussed on identifying relevant interests, engaging partners in joint learning and beginning the process of establishing common objectives for the management of the catchment. Despite the differences in circumstances and local approaches, there was a general concern among the participants that locally-produced catchment plans may have a limited impact on strategic and operational decisions within the Environment Agency because of the lack of a clear procedure to link them with the river basin district planning process and subsequent actions to meet the requirement of the EU WFD. Indeed, some participants felt that organisational reputations and relationships within local networks would be severely damaged if the catchment-based approach proved to have little influence outside of the local groups themselves or was not actively supported by government and the Environment Agency in the future. In addition, if was felt that the catchment-based approach is currently operating as a 'soft' process that relies on voluntary co-operation and collaboration among the members of local groups and therefore is unlikely to have a significant impact on more complex and intractable catchment problems that are tied to, for example, regional or national policies for farming, economic development, land use planning or water supply.

Conclusions, Policy Implications and Recommendations

Internationally, catchment or watershed-based planning and management has become widely recognised as an important approach for environmental protection and promoting sustainable use of land, water and related natural resources. At the same time, many uncertainties exist regarding how catchment management can be translated effectively from concept to practice, particularly regarding

how local actors and interests that in the past have been typically excluded or merely consulted might play a much more active role in decision making. It is also widely recognised that catchments are complex systems and that many of the problems associated with them are 'wicked' and therefore very difficult for government departments or public agencies to respond to or resolve on their own. As a result, the success of catchment-scale planning and resource management depends on the ability of different interests and actors to collaborate with each other so that knowledge, skills, and resources can be combined to identify and work towards a common set of aims or objectives. Collaboration, however, is a new and unfamiliar way of working for many actors who are perhaps more accustomed to using their authority or acting competitively to promote their individual interests.

Since March 2011, the UK government has encouraged organisations with interests in the use and management of catchment areas to form local collaborative groups with the aim of producing jointly agreed plans which identify important issues and concerns, establish priorities for action and, where possible, outline arrangements for the sharing of responsibilities and implementation of actions. Although written national guidance was provided at the outset, host organisations were given freedom to develop approaches to catchment planning and management which they believed would meet local needs, and therefore would be effective in encouraging multi-party collaboration. The research described in this report examined how collaborative working has been interpreted or 'framed' by organisations that are hosting catchment-based initiatives, and how those understandings have influenced their strategies for encouraging collaboration within the different catchment areas. In this final section, the main conclusions arising from the research are presented, the implications for future government policy are considered and recommendations for the future development of the catchment-based approach are outlined.

The research findings show how the development of individual catchment-based initiatives has been strongly influenced by contextual conditions. Nationally, the policy initiative has been broadly supported by wildlife and river conservation groups. Many were attracted by the prospect of funding to support their work, particularly when other sources of finance were being cut. However, uncertainties regarding future government policy for catchment-based management and funding arrangements meant that host organisations generally adopted a cautious, low-risk approach whereby they have attempted to focus on recognised issues and problems related to habitat and water quality at specific sites that they believe have been ignored or have fallen in to gaps created by other policy initiatives such as Catchment Sensitive Farming (CSF), Catchment Restorations Funds (CRF) and river basin district planning. Locally, levels of interest shown by powerful actors such as landowners and the environmental management objectives of the host organisations have had a marked bearing on the definition of the catchment-based approach, and therefore the direction taken in each of the initiatives. The net effect of these circumstances has been that the catchment-based approach has in general been interpreted quite narrowly as an additional 'management tool' that can be used to deliver on-going habitat improvement projects rather than a distinct strategic and organisational framework for catchment-scale planning and management. The implication is that, as currently constituted, the catchment-based approach is unlikely to bring about a radical transformation or shift in practices towards collaborative planning and

management of whole catchment systems. *A key recommendation for government, therefore, is that greater policy clarity should be provided regarding the intended scope of the catchment-based approach. This would encourage local groups to consider a wider set of inter-connections that affect their catchment, including relationships between environmental quality and economic activity and also the policies, regulations and other institutional arrangements that affect the way in which water, land and other resources are utilised.*

Under these prevailing conditions, catchment problems have typically been framed according to the priorities and concerns of the host organisations and other interest groups that are already actively involved in local river conservation networks and on-going projects targeted at improving environmental quality. At the same time, institutional difficulties such as poor policy co-ordination, inadequate sharing of data, inaccurate appraisal of environmental conditions, inappropriate use of authoritative styles of decision making and insufficient public participation were widely recognised as important aspects of the overall problem of managing catchment systems. However, in other cases, catchment-scale intervention was not regarded as an appropriate response or solution for local problems related to the water environment. Consequently some organisations have opted not to seek closer collaboration with other local actors and interests at that particular geographic scale. Overall, these findings imply that collaboration is perceived to be a key factor in the success of catchment-scale management, but nevertheless collaboration is being applied at present as a response to quite a narrow range of problems that reflect the power and influence of the host organisations and other members of established local actor networks. This implies that the kind of organisation that is nominated or selected as a host has a significant impact on the framing and prioritisation of problems, the types of partners which are recruited, and the orientation of the catchment-based initiative. *It is therefore recommended that government produces additional guidance on the hosting role, including the organisational characteristics and approaches that are needed in order to successfully design and facilitate a truly collaborative catchment planning and management process. This should include, for example, advice on the importance of carrying out a detailed stakeholder analysis as a precursor to the formation of a steering group so that problem-framing activities include a broad and balanced range of interests and perspectives.*

Given that the catchment-based initiatives had only been operating for a number of months rather than years, it is understandable that long-term collective objectives had not been firmly established in many cases. In some instances, the local initiative was treated as a short-term project and therefore attention was focused on operational-level actions that could be accomplished quickly without the need for detailed planning or development of strategic goals. Where attention was focused on the setting of strategic directions, host organisations were using a number of different approaches that reflected their sense of their own decision making power and authority, and also confidence regarding the strength of their knowledge of catchment conditions and problems. As such, in some cases directions were set on the basis that the problems were known and understood, and that there was no need for debate or cause for disagreement about the kinds of responses or actions that were needed. In other examples, uncertainties were more openly acknowledged and attention was focussed on the re-analysis of

available evidence and consideration of alternative perspectives. In a few cases, host organisations attempted to avoid making assumptions about desired responses to problems within the catchment area and adopted the role of a facilitator so that collective goals and objectives could be set on the basis of open debate and deliberation within the catchment management group. The implication is that while a single correct approach does not exist, catchment-based initiatives can be 'misdirected' when uncertainties and gaps in knowledge are overlooked and alternative accounts and interpretations of problems are not fully considered. *A recommendation for both government and local catchment groups is that the desire to 'rush-in' and to attempt to solve problems quickly should be resisted. Sufficient time needs to be allowed for directions to be set on the basis of collective debate and judgement regarding what is and is not known about the use and condition of the catchment. Furthermore, catchment management groups should be encouraged to remain open to the possibility that their direction may need to change over time, and that goals and objectives may need to be adjusted as circumstances change, new knowledge emerges and collective understandings evolve.*

Currently, catchment management groups are at different stages in terms of developing inter-organisational structures to support collaborative working. Many are still identifying and establishing working relationships with potential partners, and are attempting to attract interest and find a niche for catchment-scale management within a crowded institutional landscape. In general, host organisations have followed a pragmatic approach to collaboration in which representatives from their established nature conservation and habitat management networks have been recruited to informal and ad hoc steering groups. Steering groups have served as effective mechanisms for information exchange, social learning and the establishment of common objectives, but do not provide balanced representation or diversity in terms of the full range of interests within the catchment. The composition of steering groups has tended to compound the narrow framings of problems and the directions that are closely tied to river conservation and habitat management priorities. At the time of the survey, none of the hosts or steering groups appeared to have given much consideration to the development of more formal inter-organisational structures for decision making because future government policy and funding arrangements were perceived to be too uncertain for firm arrangements to be made. In some cases, structuring was not seen as an important issue at all because efforts were focused on the delivery of on-the-ground improvements rather than collective decision making. It was also clear that the involvement of the Environment Agency was significant in the development of local initiatives. Staff from the Environment Agency provided valuable information and support for the steering groups but at the same time the Agency itself was able to use this arrangement to influence the direction taken in the catchment-based initiatives. In a few cases, dialogue had been constrained due to a history of disputes between the Environment Agency and other stakeholders within the catchment areas. Given that the hosts were focused on establishing working relationships with specific stakeholder groups and organisations, in almost all cases arrangements for wider public engagement and participation in decision making had not been developed. These findings imply that collaborative structures for catchment management tend to evolve over time according to the dynamics and power of inter-organisational relationships. Initially, ad hoc arrangements appear to be quite effective but as the initiatives develop, issues related to catchment governance such as fair representation of legitimate

interests, funding arrangements, rules for decision making, the resolution of disagreements and disputes, and the role of the public alongside organised groups begin to emerge. *A key recommendation for government, therefore, is that further guidance is provided on how the transition from catchment-based management to catchment-scale governance can be made. This should include advice on the range of alterative organisational models and design principles that can be used to enable collaborative decision making, as well as the role of facilitation, negotiation, deliberation, multi-party dialogue and public participation.*

The research findings indicate that, as currently conceived by local groups, the catchment-based approach can help to deliver improvements in environmental quality, particularly when attention is focussed on specific sites that matter to the hosts and others who share their interests and concerns. However, the rate of progress is contingent upon local circumstances and the strength of existing inter-organisational relationships. In effect, each initiative has its own 'starting point' which defines the challenges which are faced and the kinds of strategies that are put in place to nurture and develop collaborative decision making for catchment-scale planning and management. At the same time, there is a collective sense that the impact of the catchment-based approach is currently limited by its weak status as a recently-introduced policy instrument (RIPI) which is reliant on voluntary co-operation of local actors who often have very limited power, influence and resources. Furthermore, impacts are limited due to the lack of clear procedures linking local catchment initiatives with river basin district planning as well as to institutional arrangements related to other policy areas such as farming and food production, economic development, land use planning and the provision of water services. This situation implies that, as constructed at present, the catchment-based approach can have an impact in specific policy areas related to nature conservation, habitat management and river restoration but is not sufficiently robust or connected to critical policy process that fundamentally affect the use of land and water to be able to have a dramatic effect on the condition and sustainability of whole catchment systems. *A final recommendation for government therefore is to clarify and strengthen the relationship between the catchment-based approach and arrangements for the implementation of the WFD, including the preparation and implementation of plans at the river basin district scale. In addition, the strength and legitimacy of the catchment-based approach could be enhanced in a number of ways, including the introduction of limited co-funding arrangements that include a mix of national and local contributions, demonstrating wide-spread political support from government ministers with responsibilities across a range of policy areas and civil service departments, and actively promoting the philosophy and mutual benefits of catchment management to audiences within local government, civic society and the public utilities sector.*

Overall, the research findings indicate that whilst much of the literature portrays collaboration as a distinct and clearly defined form of interaction, in reality it is a far more dynamic, diverse and unpredictable type of process. Given the opportunity to develop collaborative catchment-based initiatives, host organisations and local groups have self-organised, defined problems, and set directions in different ways and developed their own strategies for producing outputs and achieving outcomes which matter the most to them. This kind of institutional innovation and local creativity should be

welcomed and encouraged and not stifled by the imposition of a particular model of collaboration or insistence that certain methods or practices are followed. At the same time, it is important to recognise that local catchment management groups are working together in varied ways and for different reasons. Individually, they are able to move forward at different speeds according to local contextual conditions, their abilities to harness knowledge, skills and resources, their capacity to agree on collective goals and ambitions, and also the level of complexity and uncertainty that characterises problems within their catchment area. Consequently, in the future many alternative resource management and governance arrangements are likely to emerge that could produce different mixes of local benefits and therefore potentially create more variation in terms of the use, quality and conditions of catchment landscapes across the country.

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