

Cranfield University

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**The role of legitimacy in the relationships between
water users and governance bodies under conditions
of increasing water stress**

School of Industrial and Manufacturing Sciences

PhD thesis

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Abstract

Water stress is an issue of increasing concern in developed countries. In particular localised water stress 'hot spots', are a new challenge. This emergence creates a series of difficulties. Firstly, the potential impact of water stress in modern political economies is not fully understood by either natural or social scientists. Secondly, policies targeted to limit water stress may need to be deployed well before it moves from an episodic to an endemic phenomenon. These policies may entail radical changes to the way water is valued and consumed by society.

Understanding how existing relationships between water users and water governance bodies are negotiated is crucial to successful policy implementation. As water stress might potentially strain these relationships, the aim of this thesis is twofold. Firstly to determine where opportunities may exist for developing consensual, pro-resource strategies within and between these two stakeholder groups. Secondly, to examine the current strengths and weaknesses within these relationships to isolate what changes may need to be instigated in order to support approaches which manage water stress.

Exploring the role that legitimacy plays in these current relationships will underpin this analysis. Legitimacy can be understood as the concept that explains how authority operates in modern political economies. In other words, legitimacy enables people, processes and policies to function;

transaction costs are subsequently lower in polities where legitimacy is well embedded.

Reflexively moving between theory and empirical fieldwork, a detailed analysis of one river catchment, the River Nene, and the water users and governance bodies within it, is undertaken. Primary conclusions suggest that water stress as a concept has a very low profile; however, different symptoms of water stress are recognised along the catchment with a wide range of possible solutions offered by stakeholders. Legitimacy is embedded within governance bodies along the catchment, though it is not uniformly distributed; this colours the perception of their effectiveness in water resource management. Novel policy options to ameliorate water stress are acceptable to water users, though reuse technologies and steep price hikes are rejected.

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Chapter 1: Water Stress, Legitimacy and the Politics of Water

An overview of the thesis and an outline of the research proposal

1.1 Introduction

The thesis focuses on the role that legitimacy plays in the relationships between water users and governance bodies. Understanding the operation of legitimacy in these relationships can assist in evaluating, developing and deploying policy options that aim to resolve the incipient problem of increasing water stress.

Section 1.2 will show that conditions of increasing water stress will almost certainly become a central concern for many countries not normally associated with water stress conditions (see Figure 1). Water stress is not only a challenge for the developing world. A brief review of the scholarship will suggest the dynamics of the problem. The literature presents both the historical ability of developed countries to overcome natural water scarcity, and the challenges countries face when attempting to implement successful water resource management models. However, certain issues have not been adequately addressed in the literature to date. It is necessary to explain why developed countries have generally failed to address water stress issues despite the relative abundance of financial and technical capabilities. It will

then be argued that water stress will force the issue of legitimacy onto the agendas of water managers and policy makers.

Sections 1.3 and 1.4 will elaborate this theme. These sections will show that water stress, and the need for institutions to adapt to the pressures it occasions, makes necessary a study of the legitimacy of water management institutions and their interaction with water users. The chapter then moves to detail the aims, objectives and assumptions that define the parameters of this research. The chapter concludes by providing an overview of the structure of the thesis, chapter by chapter, and ends with a summary of the publications, papers and presentations that have been generated during the timeframe of this research.

1.2 Water stress and the politics of water

Although water is a natural resource, its control and management makes it subject to diverse concerns that reflect its social and economic importance. Therefore ways of measuring water, of talking about indicators of water stress and policy options to combat the problem, make necessary a political understanding of water. This section seeks to frame these concerns by sketching out the problematic of water stress. Addressing water stress and the issues that it raises leads to a reconsideration of the way in which water issues and politics interface. Water management, in particular the adaptation of institutions to change, becomes linked with the concept of legitimacy; in

other words, to discourses and policies in which the political choices made about water use can be justified, implemented and explained.

Since the onset of rapid industrialisation in the mid 1800s the dominant paradigm governing water provision planning in developed countries¹ has been assured water supply. Consequently water systems have been shaped by the need to plan around meeting demand, both in terms of water quantity and assured quality. For almost all developed countries water and sanitation provision is intrinsically linked to public health and economic productivity. The water management sector has utilised a diversity of organisational structures to achieve these ends. This diversity is due a combination of the historical development of the sector along with different political frameworks, institutions and geographical-climatic factors.

Despite these institutional variations the management of water straddles utility provision and infrastructural development. Subsequently, water resource management has traditionally been a state driven provision, not least due to the heavy capital and maintenance costs of developing an infrastructure which includes sewerage networks, storage facilities and water treatment plants.

¹ The thesis distinguishes the different resources, facilities and technologies available to developed as opposed to developing countries.

As a result of its link with assured supply, water has, over time, been privileged as a social 'right'² with almost universal water and sanitation provision within developed countries. Attempts to restrain or qualify water use, either through fiscal, legislative or technological means, have generally played a role only in times of drought events, with social acceptance of consumption curtailments accomplished only through a perception of a general crisis³. This has intensified debates concerning water's status in society. Should it be viewed as a public good, i.e. available equally to all, or as an economic good, i.e. a product to be traded like any other? The issue of water's 'status' in society is therefore highly politically charged.

A growing body of research indicates that freshwater quality and available water quantity are now changing at a faster rate than previous records show.⁴ The rate of change and nature of change is not uniform either between developed countries or within national catchments.⁵ These changes have been associated with a number of drivers: growing populations, demographic shifts, climate change and lack of infrastructure investment. Changes to water quality and available water quantity can also be described as contributing to

² There is actually no legal 'right' to water in English law, unlike other countries such as South Africa. See National Water Act number 36 (1998). Department of Water and Forestry Affairs, Republic of South Africa. See also Gleick (1998).

³ This is pertinent at the time of writing as England is experiencing water shortage in various regions due to the second driest winter in a hundred years. This had lead to several water companies issuing hose pipe bans and the high profile of water management issues in national media (<http://news.bbc.co.uk/1/hi/England/4647577>).

⁴ See Shiklomanov (2000); Arnell (1998; 1989); WCED (1987).

⁵ There are improvements in some areas, for instance pollution control. However, these improvements need to be placed in the context of deterioration in overall quality, for instance a growth in the presence of heavy metals and nitrogen levels in water.

regional pockets, or 'hotspots' of water stress. Water stress threatens livelihoods at numerous levels; from rising household bills through to an inability of societies to maintain their normal food and economic productivity regime without some measure of readjustment. As the United Nations Educational, Scientific and Cultural Organisation's (UNESCO) 2003 world water report indicates, in the next twenty years the amount of freshwater available to the global population is set to fall by 20%; water stress across the world looks set then to increase (UNESCO, 2003).

Water stress has a range of technical definitions. Fresh water withdrawals of 20% and above of the total available resource is one measure used by the United Nations to indicate technical water stress i.e. that a society may encounter technical difficulties in supplying more fresh water. The most commonly used definition, as adopted by various United Nations agencies, is that a country or region is experiencing water stress when annual renewable fresh water supplies⁶ drop below 1,700 m³ per person. When annual renewable fresh water supplies drop below 1,000 m³ per person, the population faces water scarcity.⁷ To put these figures into perspective, the Food and Agricultural Organisation (FAO) (2002) states that the UK's total annual renewable fresh water resource availability currently stands at 2,400

⁶ It must be made clear that water stress refers only to renewable and accessible freshwater resources; this does not include water locked in ice sheets, glaciers, soil or in non-rechargeable aquifers. These sources represent 97% of the world's freshwater reserves.

⁷ See also Falkenmark and Wildstrand (1980; 1992).

cubic metres⁸; we can compare this with 198 for Yemen, 9,448 for the USA and 1,160 for Belgium.

There are many flaws in characterising water stress in this manner. Firstly this definition only includes renewable fresh water that is found in surface or groundwater and in aquifers and rainwater. This is also referred to as 'blue water' (Falkenmark and Rockstrom, 43: 2004). A more important resource, in terms of volumetric water use, is green water. This can be conceptualised as soil water and water used in the evapotranspiration process of biomass production (Falkenmark and Rockstrom, 43: 2004). In terms of global sectoral use of water agriculture is the largest user. This is true both of blue water use in terms of water abstracted for irrigation and, within the water cycle in terms of rainfall 'captured', for green water use. It is clear then that focusing on only renewable blue water volumes provides a limited understanding of global water flows. In short, there is sufficient blue water to prevent domestic water stress; the problem lies in management capability to adequately allocate resources. This is explored in more detail later in the section. It is important to reiterate then that when we talk of water stress in this thesis the emphasis is on the threat of poor management techniques to allocate resources between human and environmental needs.

⁸ The Environment Agency states that the available internal annual renewable water resources for England and Wales stands at 1334 cubic metres per person. (Environment Agency, 2001).

Secondly, the focus is only on volumes of water. Water quality is excluded. As Pereira *et al* (2002, p.176) note: 'water scarcity concerns the quantity of the resource available and the quality of the water because degraded water resources become unavailable for more stringent requirements'. This is highly significant for countries that suffer from groundwater pollution, such as Germany (European Environment Agency, 2003), or where aquifers have salt water intrusion through overuse, as is common in many coastal resorts such as the Marina Baxia river basin in Spain (European Environment Agency, 2003). By excluding water quality from a working definition, a variety of drivers that could indicate encroaching water stress remain hidden.

Thirdly, this definition does not look at regional variation of water availability within a national budget. This simple ratio accounting obscures the accessibility and non-uniform distribution of water. Some regions of a country will suffer water stress whilst the national budget will appear healthy – such is the case for California as an element of the USA's water budget. Also excluded is the natural rhythm of the hydrologic cycle; many countries are water stressed for periods of the year until the rains come. This creates annual seasons of water stress that the definition ignores. This is also true for areas of the world where events such as droughts or floods are cyclical.

This homogenisation of the water stress definition used by national governments, United Nation (UN) agencies and scientific disciplines also reveals a further political dimension to water stress. A country may have the

physical water resources and the engineering technology to counter regional disparity of water availability, but in any planned economy resources may not be allocated effectively or efficiently for political or economic reasons.

Structural issues such as institutional, economic or political factors may create provision bottlenecks leading to water stress scenarios that are divorced from resource availability.

The political dimension of water stress is of key importance. As stated above, for Falkenmark and Rockstrom (2004) there is plenty of blue water available for a sector which is given undue prominence; domestic water supply and sanitation. The problematic here lies not in terms of availability but of management. They argue that, volumetrically at least, domestic water needs are relatively low at around 30 cubic litres per person per year compared with the 1200 cubic litres per person per year that agriculture uses for food production (Falkenmark and Rockstrom 58: 2004). Yet Falkenmark was responsible for the water scarcity index still used by the FAO and other UN agencies which focuses on domestic and sanitation needs. She has cogently argued that this creation of the notion of scarcity was essential in order to put water issues on the political map. Her new approach, ecohydrology, seeks to remedy the domestic water bias of water scarcity discussions by emphasising that the real scarcity lies not simply with the 'water crowding' of domestic water that is experienced globally but with the very real shortfall in water available for crop production which will reach its limits at current levels within 50 years (Falkenmark and Rockstrom 2004). What Falkenmark has achieved

with her work has not only been to raise the visibility of water issues but to refine our understanding of the types of water available to us and the steps needed to face global challenges.

Water stress is particularly detrimental to developing countries, which generally do not possess the technical, economic or social resources to reduce water stress. The majority of research into water stress quite rightly explores the impacts of the phenomena suffered by these nations, as they are more prone to climatically suffer water stress being within the arid and semi arid zones of the Southern hemisphere. Yet episodes of water stress also have significant impacts on developed countries. These impacts include environmental degradation, economic deterioration and social upheaval. These factors could potentially also have a secondary impact on developing nations who, many claim, often bear the brunt of solution finding by the North (Shiva, 1991). This exploration lies outside of the remit of this thesis. Instead it is enough to posit that whilst developed nations are viewed as having the capacity to solve water stress this does not mean they have the will to acknowledge its imminence.

The politics of water in a time of acute water stress can also be seen in Allan's concept of 'virtual water' (1997). This concept explores how water stressed countries circumvent absolute water scarcity and ensure food security through food imports. Rather than diverting scarce water resources into irrigation fed agriculture these countries,⁹ diversify their economies away from producing

⁹ Examples include Jordan and Saudi Arabia.

food and into high performing sectors such as oil production, information technology and financial services. 'Virtual water' refers to the water it takes to produce the agricultural import. For example, it takes 1000 tonnes of water to produce 1 tonnes of wheat, so by importing 1000 tonnes of wheat a country can 'save' 1,000,000 tonnes of water and the additional infrastructure costs of storing, cleaning and distributing and administering the provision of that water. Virtual water marks the end of food security for water stressed countries and sees the world's trading market as the arena in which water is moved from water rich to water poor countries. In terms of social costs, as long as the individual country's economic performance is strong, the crisis of water stress is averted. However, if that economic performance is weakened the results could be very serious with both food and water shortages. In many respects virtual water masks global flaws in managing water needs.

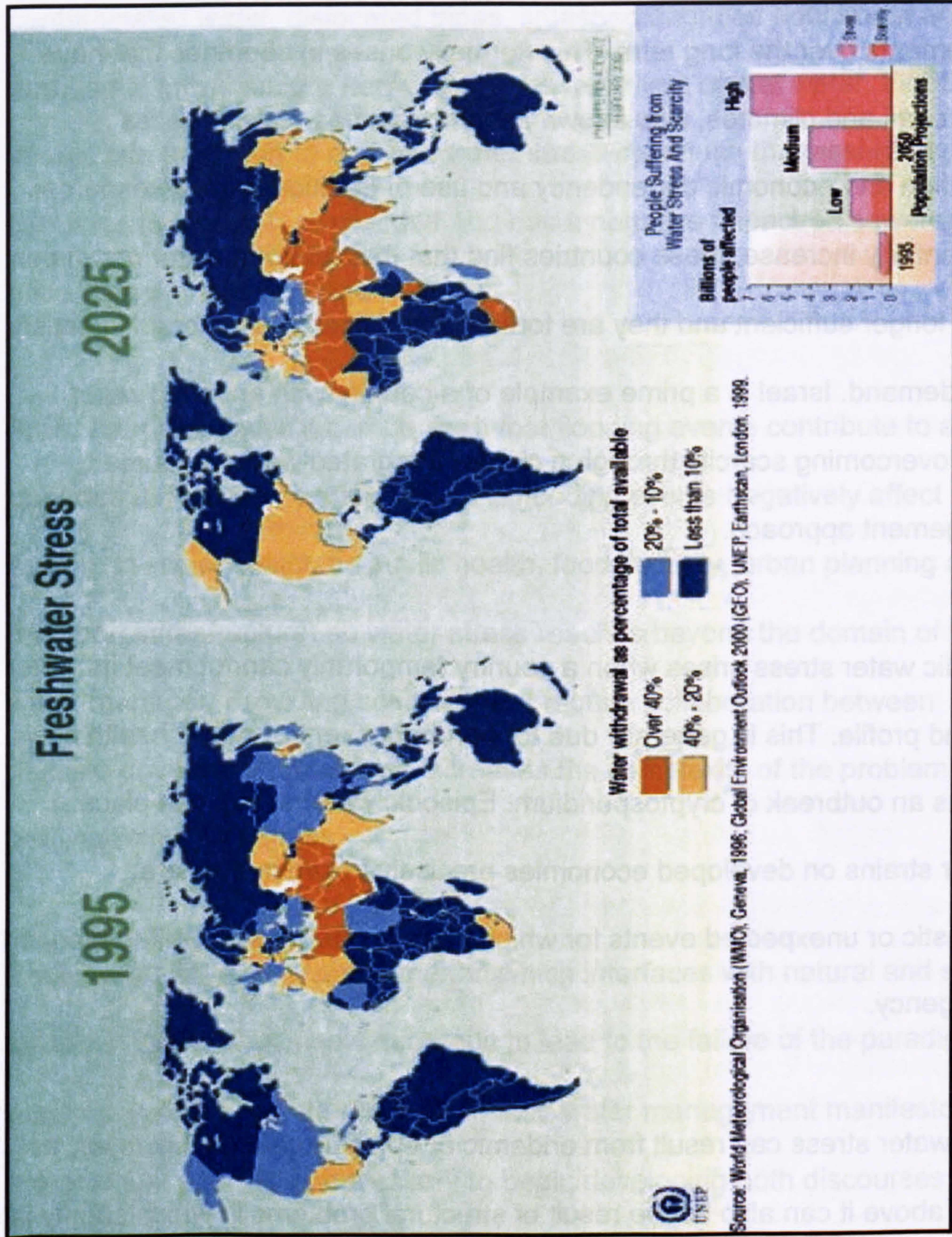


Figure 1: Projected growth of water stress to 2025

1.3 Types of water stress

Water stress can be described as either endemic or episodic. Endemic water stress arises when a country is unable to meet its renewable water requirements over the long term. This normally arises in countries that have arid or semi arid climates, also known as xeric regimes. Over time, as population and economic dependency and use of traditional water resources exponentially increase, these countries find that their existing water resources are no longer sufficient and they are forced to find alternative means to satisfy water demand. Israel is a prime example of a country with endemic water stress overcoming scarcity through a closely integrated water resource management approach.

Episodic water stress arises when a country temporarily cannot meet its water demand profile. This is generally due to a drought event or public health crisis, such as an outbreak of cryptosporidium. Episodic water stress can place greater strains on developed economies precisely because they are stochastic or unexpected events for which there is often only a limited planned contingency.

Thus, water stress can result from endemic or episodic causes; however, as stated above it can also be the result of structural problems in which supply is inadequate even if resources are available. Without management solutions

water stress can quickly lead to water scarcity or water crowding.

Consequently a comprehensive definition of water stress includes not merely assured water availability, but also water quality. Increasing incidences of flooding across Europe within the last decade have led to deluges of contaminated water, dislocated pipes, smashed irrigation equipment and damage to infrastructure networks for the treatment of that water. Flooding events can then lead to episodic water stress inasmuch that assured supply becomes temporarily suspended and has a negative impact on sewerage, flood defence and drainage services.

From this perspective it can be seen that flooding events contribute to a less bounded definition of water stress. As flooding events negatively affect many sectors in society (such as public health, food security, urban planning and transport infrastructure) so water stress reaches beyond the domain of the water manager. Providing solutions that require collaboration between multiple government ministries increases the complexity of the problem of dealing with water stress.

Thus, water stress is a phenomenon which interfaces with natural and social systems. Water stress now threatens to lead to the failure of the paradigm of assured water supply that has dominated water management manifestos in the post war era.¹⁰ It is necessary to begin developing both discourses and

¹⁰ See Kinnersley, 1994.

policies that can prevent the collapse of the paradigm of assured water supply.

1.4 What can be done about water stress? The problem of adaptation

This emergent challenge¹¹ of water stress within developed countries not historically typified by water availability problems creates a series of difficulties. Firstly, the potential scale of the problem within developed countries is not fully understood by either natural or social scientists. This is because it is not always easy to discern whether an episode of water stress is actually the symptom of an endemic problem or an anomaly. Also the opportunities for natural and social scientists to work together on water stress issues have not been readily available and this has limited information and idea exchange.¹²

These problems can be approached through the umbrella notion of adaptive capacity.¹³ This term will be more thoroughly defined in Chapter 2, but it is

¹¹ 'Emergence' is a contentious term and has a specific connotation in natural science and in systems theory. Its use here is to denote water stress' relative novelty when addressing new water management challenges in developed countries.

¹² Increasingly natural and social scientists are working together as evidenced through the AQUADAPT project which looks specifically at increasing incidences of water stress within Europe; www.aquadapt.net.

¹³ Ohlsson and Turton have written extensively on the concept of adaptive capacity. A country can be categorised as naturally water scarce due to climate or topography. Adaptive capacity should be included into any definition of a county's natural resources. Put slightly differently, natural water scarcity creates 'first-order scarcity' whilst a lack of adaptive capacity is termed 'second-order scarcity' (Ohlsson, 1999). If adaptive capacity can be understood to comprise of economic, technical, social and political elements, a deficit in any one element can be detrimental to the ability to provide adaptive responses. This creates a balance between 'environmental capital', 'social capital' and economic development (Allan and Karshenas 1996; Turton

possible to suggest an outline here. Adaptation is a concept that addresses the capacity to adjust to change. Adaptive capacity can thus be seen to be composed of two distinct elements – structural adjustment, which is engineered by the state, and social adjustment which sees a cultural change as necessary to ensure the longevity of these structural adjustments. The central problem is that water institutions may not be able to easily adapt to the necessary changes brought about by water stress. For instance, Turton and Reisner, amongst others, have argued that a recognition that supply sided water management regimes are untenable in the long term, or ‘unsustainable’, leads to a paradigm shift where water demand management (WDM) interventions begin to surface. Reisner uses the history of the American hydraulic mission in the arid West of the country as an example of this (Reisner, 1993). Turton (1999a) argues that WDM has a trajectory that follows a two stage process. Firstly, water users become more efficient with water i.e. they do more with the water. Yet this does not tackle the scale of water use nationally. Whilst proficiency slows down water stress problems it does not stop them. This leads to a secondary trajectory within WDM, that of a reallocation i.e. creating socio-economic changes to do something else with the water, also termed ‘allocative efficiency’ (Turton, 1999a, p.20). The point at which both supply and demand management strategies fail,¹⁴ are termed ‘absolute scarcity’: at this point the limits of efficiency have been reached and are replaced with social survival techniques.

1999a). Moreover, an imbalance within these three factors requires a social/political or cultural shift in order to return to equilibrium and to avert a crisis.

¹⁴ i.e. are unable to free up any more resources.

This is perhaps a worse case scenario. A second difficulty is that policies that could be introduced to counteract water stress may need to be deployed well before water stress moves from being an episodic to endemic phenomenon. Yet in order to do this water stress needs to be recognised as a problem both by the public and by politicians themselves. This is particularly difficult in countries where water stress is located in regionally specific 'hot spots'. One population group may need to be subject to particular policies and another may not. Proposing asymmetric policies that target certain geographical areas can be politically fraught and may lead to social unrest.¹⁵

Thus water stress may dramatically alter the way in which water is privileged in developed economies. It is possible that demand management strategies alone will not be sufficient to cope with water stress. Demand management strategies currently focus on promoting reduction of water consumption through moderate price rises, education campaigns and the promotion of water efficient technologies.¹⁶ What will almost certainly need to be developed are policies that change the way society uses and conserves water in line with societies that have learned to cope with water stress. These may include the use of grey water or rainwater harvesting technologies in homes, environmental landscape changes to install water hardy plants and 'green' drainage networks, together with curfews on the use of inefficient watering

¹⁵ Haughton, 1998.

¹⁶ Jeffrey and Gearey, 2004.

systems.¹⁷ They may also be accompanied with more significant price rises in order to reduce consumption.

There is also the possibility of sectoral reallocation of water. At present the agricultural sector utilises around 70% of an average country's fresh water budget (Ramirez-Vellejo and Rogers, 2004) – and up to 90% if soil water is included. One solution to water stress would be to massively downsize this sector. This, of course, is highly contentious and at odds with traditional food security approaches. Some advocates argue that establishing water markets with attendant water rights is a more efficient means to reallocate water (Stikker, 1998).

There are thus a number of options that could reduce water stress. Yet the fundamental challenge lies in the acceptance of these, often radical, policy options. The current supply-orientated paradigm, prevalent in almost all developed countries, has been planned to ensure that peak consumer demand is always reached. Water supply is also expected to have a uniform high quality even if its end-use does not require it. For theorists such as Postel (1992), Davis (2001) and Reisner (1993) this high public expectation of water provision has been described as the epoch of the hydraulic society. The privileging of assured water provision within developed economies has thus created a scenario of limitless supply and excess quality for many routine uses, such as toilet flushing, car washing and garden watering. We therefore

¹⁷ Environment Agency, 2001; Department of Trade and Industry, 1999.

have a delivery system with few restraints to quantity and no link between quality of water and its end use. Water stress is likely to exacerbate cultural expectations and strain the limits of management capability.

Forecasting the need to implement policies that require consumers, or water users, to adapt¹⁸ to changing strategies of water use and provision is one way of coping with water stress. Yet these methods could be seen as contentious as they require civil society to change the way it values and uses water. Will policy makers be forced to impose innovative policy mechanisms on the electorate? Or is the electorate actually more aware and so potentially more receptive to water stress policies than policy makers may allow? After all, water efficiency initiatives have been advocated and deployed at different levels in developed countries for many years, particularly in those which have experienced episodic water stress.

Policy makers face great challenges. Firstly, they must anticipate what policies will be accepted. Introducing policies in a piecemeal fashion may not do enough to control water stress. Yet introducing policies too quickly, or policies that are too radical, may simply alienate the electorate. Politicians are unlikely to champion policies that are too challenging for fear of losing electoral support.

¹⁸ Adaptivity and adaptive management is dealt with in detail in Chapter 2.

The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

Secondly, policy makers must consider whether policies are likely to have the same effect over the target area. If regional or local hotspots are prevalent then a different policy or policy instrument mix may need to be developed. But how will it be possible to determine correct policy? Is a water stress indicator in one area likely to provide the same results in another?

Lastly, the timing of policy implementation is crucial. Should politicians introduce policies that prompt adaptive responses before water stress becomes problematic or will this simply confuse and alienate policy subjects? If policy makers wait until water stress is clearly a problem will this leave them open to accusations of inefficiency and also serve to alienate the electorate?

1.5 Legitimacy and the challenge of water stress

Given the emergent status of water stress, and the variety of possible ways of coping with it, understanding the nature of the extant relationships between water users and those institutions tasked with governing or have stewardship over water resources is crucial. We will be concerned with a distinction between formal and informal governance bodies. These terms will be more thoroughly defined presently (see below, Section 1.7, Assumption 3). For the moment it is necessary to briefly overview some key themes.

As increasing water stress might potentially strain the relationships between water users and governance bodies, in a variety of ways, research needs to

be undertaken to provide a clearer understanding of the nature of these relationships. Put another way, it is necessary to understand how water users and institutions view current water management strategies. It is also necessary to consider how these two groups relate to one another. It may then be possible to illuminate what types of problem areas water planners and policy makers trying to tackle water stress may face.

A concept that illuminates how we can understand these relationships between water users and governance bodies is that of legitimacy. Legitimacy is more thoroughly defined in Chapter 2, but, in general terms, it can be seen as the justification of decisions, and actions within the context of democratic societies. Legitimacy enables decisions and policies to be undertaken with the general consent of the population. Legitimacy, along with accountability, transparency and equity, is one of the building blocks of 'good governance' (Rhodes, 1997).

It will be argued that research needs to focus on the types of institutions, people or actions that build legitimacy. At the same time the research also concerns itself with those factors that impact negatively on perceptions of legitimacy. If a robust model of legitimacy which characterises water users and water management relationships can be created, then it may also assist in the development of policy instruments that both ameliorate water stress and enable institutions and populations to adapt to changing conditions of water quality and water quantity.

An understanding of trust is also essential to a definition of legitimacy that is relevant to the water sector. This makes it necessary to build on work undertaken within political science to show how the concept applies to the relationships with which this thesis is concerned. It will also be argued that perceptions of effectiveness or efficacy are also central to the legitimacy of water governance bodies.

These different means of gaining or proving legitimacy are important when thinking widely about the water stress challenge. Given the changes that are likely to be brought about, understanding the different methods and people involved to phase in these new policies is important. As yet, few studies have attempted to explore the role that legitimacy might play in preparing or assisting water users and governance bodies in reconciling themselves to conditions of increasing water stress. In order to attempt to do this effectively, and within the parameters of the thesis timeframe and funding, the research has selected to use a single river catchment as the scale of analysis.

1.6 The aim and objectives of the thesis

This thesis aims to analyse and explore relationships between water users and governance bodies at a river basin scale in order to determine if opportunities may exist for developing strategies to ameliorate water stress. The key to these relationships is the issue of legitimacy; or how decisions or

acts are justified and made generally acceptable. Legitimacy is addressed at both a theoretical and empirical level. The theoretical level is provided through an engagement with the concept of legitimacy. The empirical level is addressed by undertaking empirical research with water users and governance bodies along the River Nene catchment in England. This empirical dataset is then reflexively reviewed within the conceptual framework that underpins the thesis, to evaluate how far legitimacy may play a part in enabling successful processes of change and adaptation.

The research has five key objectives:

- 1) To document the policy and planning options i) water users and ii) governance bodies themselves put forward as possible strategies to combat water stress at the catchment scale.
- 2) To assess the potential adaptivity of these two stakeholder groups to change; to understand the ability of stakeholder groups to respond to new policy options and management strategies that accommodate water stress.
- 3) To explore the dynamic that exists within and between water users and water governance bodies to attempt to assess how far water stress may alter these relationships.

4) To identify the presence or absence of legitimacy in current relationships between water users and water governance bodies at a river catchment scale.

5) Lastly, if it is possible to identify legitimacy as operational for policy making and implementation, to then examine how and where it operates along the river catchment. In particular the research will explore the interaction between formal and informal¹⁹ processes of legitimacy at the basin scale.

1.7 Assumptions which underpin the research

Assumption 1

The first issue when looking at the research problem is the scope of the problem boundary. The scope of the thesis has already been limited to the impact of water stress on developed countries. However, it is not possible within a single thesis to examine how all developed countries may adapt to water stress. This is far too wide a brief, as water stress is vastly different from country to country.

It is thus necessary to consider only one country. But, again, there are problems of scope. If the thesis sets out to consider a country, then time and research constraints could lead to conclusions being based more on educated speculations than firm evidence. As we have already seen above, a national audit of annual renewable water resources does not always reveal a country's regional or local water stress hotspots. Even without further

¹⁹ These terms are defined in Chapter 2.

research it can already be surmised that pitching the research at too large a scale will weaken the applicability of its methodology and the relevance of its findings.

These problems are resolved by focusing research at a river catchment scale. Not only does this enable the thesis to develop an intimate picture of the relationships that exist between water users and governance bodies in a specified locality, but it also allows existing water stress indicators on the catchment to be incorporated into the research. This prevents water stress from remaining an abstract concept and roots it within a community's experience and knowledge.

This thesis will also consider the impact of the Water Framework Directive (WFD), at the catchment level. This also helps to determine the scale of the empirical work. By understanding in much more detailed ways how water users and governance bodies relate to each other we can see both the challenges and opportunities presented by the WFD. The case study catchment for this thesis is the River Nene which rises in the east Midlands and flows to the Wash estuary through East Anglia (see Figure 6, Chapter 2).

Assumption 2

As outlined in more detail in Chapter 4, the English and Welsh water management regime underwent a radical transition in 1989, transforming from a nationalised sector to one fully privatised and under a stringent regulatory

watch. Consequently, underlying this thesis is the assumption that privatisation, and the link between water provision and profit, has generated an expectation that funding should be readily made available for investment in water resource management, whether to reduce leakage rates, improve water quality or ensure a reliable supply. Water stress would obviously place great strains on these expectations. The thesis thus needs to explore whether the privatisation process has been successful in terms of satisfying customer expectations: is there evidence that water users feel that the water companies and their actions are wholly legitimate?

When looking through the range of surveys and opinion polls conducted by the water industry regulator the Office of Water Services (Ofwat), the environmental regulator the Environment Agency (EA), the research organisation MORI and academic research it is possible to find quantifications of service expectations, water quality and price changes (Ofwat, 1994, 2000; MORI, 2002). It is even possible to review how water is used around the home and to gain a sense of opinions of water saving technology. It is more difficult to establish whether the change to a private service was deemed legitimate and, furthermore, what types of future water policy change may be regarded as legitimate. No study was found in England and Wales that explicitly addressed these issues at a catchment level. Is it even possible to gauge adaptive potential to water stress by understanding more about legitimacy? This thesis assumes it is possible.

Assumption 3

It is important to be clear about the terms that we are using to describe governance. There are various institutions that are charged with, or have assumed upon themselves, diverse management and stewardship roles with respect to the utility and welfare of the River Nene and its corridor. A number of distinctions are necessary to describe the various remits of authority in relation to these bodies.

Governance bodies can be distinguished as formal or informal. Formal bodies, also called government bodies or authority groups, are created by Acts of Parliament, or derive their powers from Acts of Parliament. They derive their authority from formal processes. An example of the former would be the Environment Agency, created by the Environment Act of 1995; an example of the latter would be the Middle Level Commissioners in the Fenland region of the catchment. Formal governance bodies would also include those bodies with a regulatory function, as these bodies are set up by Statute. Formal governance bodies concern themselves with the articulation of policy goals and the ratification and delivery of those policies.

Informal governance bodies are not created by statute, and are not formally part of central or local government. They may often be unelected i.e. their authority stems from a general recognition that they undertake work in areas not tackled by the government. This group includes those actors and groups who may have gained credibility for expert knowledge over time.

Organisations which have proved their expertise, and so shown themselves to be essential to governance, include academic institutions, land management co-operatives and local campaign groups.

Formal and informal legitimacy may be mutually supporting, or, depending on other factors, tensions can develop. These concerns are dealt with in later chapters.

Some other points of clarification are necessary. Although there may be as a question of fact some overlap between formal and informal governance bodies, this does not spoil the overall distinction between types of governance body. It is also necessary to observe that there is a certain 'grey area' that would include commercial operators. Although neither strictly formal or informal governance bodies, private companies may adopt a limited governance role in relation to certain issues of concern where their input is made necessary or required in the management of the Nene's waters. In particular the role of the water companies creates various tensions as they have a statutory duty to provide a safe, reliable potable water supply, yet must also deliver profits to their shareholders.

A further distinction can be made between governance bodies and water users. The term 'water user' is difficult to define. In effect we are all water users. Precisely because it is such a general term, it could effectively describe both informal and formal governance bodies. However, the sense of the term is used more precisely in this thesis. Water users are seen, primarily as

individual domestic, agricultural or industrial users of water. Water users are all subject to water management policies; in other words the option spaces within which they choose to consume and use water is dictated by policies, laws and bye-laws. Water users could be more closely defined as policy subjects within this thesis.

Water users may become organised into associations. Although individual water users may be able to influence water management policies through individual action, it is more likely that an input into policy making would be achieved through some form of organisation. Organised water users can, in this sense, be considered as informal governance bodies or citizen groups. Examples of user groups or user associations relevant to this project are farmer's lobbies, environmental campaigners and consumer associations. It is worth stressing, however, that water user is used primarily to refer to individual users. It will be clear from the context whether or not any given informal governance group is an association of water users.

It is important to explain the notion of stakeholders, and how it relates to both governance bodies and water users. Stakeholders are those who have some interest in a utility or an area of social or economic activity. In this sense, governance bodies and water users can all be described as stakeholders. However, it is important to point out that there is no necessarily shared identity between stakeholders. Their perception of their 'stake' may be radically different. Thus, a water user may perceive that their stake in water is

essentially that of cheap and plentiful provision. This would clearly be in tension with an informal governance body such as an environmental pressure group, whose 'stake' is the preservation of the Nene's integrity. Indeed, it is precisely this kind of tension, and the need to mediate the different values and visions of different stakeholders that is the focus of this thesis.

1.8 Contribution of the research to knowledge, policy design and policy implementation

The thesis addresses water stress at a scale that will be informative and instructive to the current water management regime within England and Wales. Other research on water stress tends to be pitched at the national or international scale. Whilst this provides us with a bigger picture of large scale impacts of water stress it does not help develop a nuanced understanding of catchment level effects.

This thesis also provides the opportunity to anticipate what type or types of policy options to cope with water stress water users and governance bodies feel are credible and acceptable. This may help water planners introduce changes at a scale and pace that will have a minimum impact on government-consumer relations.

Attempting to identify the operation of legitimacy through empirical fieldwork will also generate a new understanding and appreciation of the negotiation of

legitimacy between authority and citizen stakeholders. Currently legitimacy is still a slightly abstract concept that is generally only identified when there is a legitimacy crisis e.g. a rejection of election results, or impeachment claim.

This thesis may contribute by providing new in-roads into identifying how and when legitimacy can be claimed by different groups.

Researching water stress before it is prevalent on public or policy agendas provides the opportunity to investigate attitudes to the water environment and water management regimes before problems are articulated. This contributes to knowledge by enabling researchers to gauge how the privatisation process may have affected citizen's views of both the water environment, water supply and water management regimes. Much literature has been devoted to scrutinising the process of privatisation and the effects it has had on poorer consumers; but little work has focused on perceptions to change in management capability. This research will contribute to an understanding of relations between governance bodies and water users in developed countries.

The research should also be able to make a contribution to the Integrated Water Resource Management (IWRM) debate. IWRM argues that catchment management is the most rational way of organising water resources. This research, as it is conducted at the catchment scale, should be able to provide some input as to whether catchment visioning is seen as a sensible, practical approach by those who live and work along the river corridor.

Lastly, the research should identify the expectations of riparians along the river corridor. If threats to water supply seem likely, do both water users and governance bodies feel that these threats can still be managed? The thesis will be able to provide data that show how water users consume and value water and the water environment itself. This data will provide comparative information to check against national consumer satisfaction surveys.

1.9 Structure and overview of the thesis

The thesis is organised around the use of empirical research to validate and illuminate its conceptual framework. The structure of the chapters details the logical progression from research hypothesis through the various stages of empirical research to conclusions.

This chapter has outlined the research problem and the reason for undertaking the research. It has also outlined the aims and objectives of the thesis together with the research assumptions used to bound the scope of the study.

Chapter 2 details the research already completed within the thesis' subject area. As the thesis' subject matter is interdisciplinary, a range of literatures are utilised including those from political philosophy, natural resource management, water stress and political science.

Chapter 3 outlines the research agenda and methods adopted throughout this thesis. It explores the problem area and identifies gaps in existing knowledge. It proposes an approach which will satisfy both the literature gaps and the problematic posed.

The various research activities undertaken in this thesis are described as follows:

Research activity 1: Background study and catchment selection.

Research activity 2/ Fieldwork activity 1: Fenland scoping review.

Research activity 3/ Fieldwork activity 2: A catchment wide domestic water user questionnaire.

Research activity 4: The development of the legitimacy dialogues model.

Research activity 5/ Fieldwork activity 3: Structured interviews with water user associations and governance bodies associated with the River Nene catchment.

Chapter 4 moves the focus of the work to building a picture of the case study catchment. In order to do this it is necessary to provide a brief review of the English and Welsh water sector. This reveals that the post 1989 water management regime returns to market ownership but within a regulatory framework that is tightly controlled at the national and European level.

Chapter 5 begins by outlining the scoping review taken in the Fenland region. This scoping review enables the development of a second piece of empirical

fieldwork, a household questionnaire of domestic water users. The methods used to undertake the research are discussed, as are the findings of the research activity. These findings from the questionnaire survey are compared with those of the scoping study.

Chapter 6 focuses on the development of a conceptual model of 'legitimacy dialogues'. Reviewing the research objectives and the methodology adopted by the thesis in Chapters 1 to 3, together with the empirical data collected in Chapter 5, the chapter reflects on the contribution that an experimental conceptual model could make to an understanding of legitimacy.

Chapter 7 details the final fieldwork activity: structured interviews with governance bodies and water user associations. These interviews have a dual purpose: to satisfy the remaining research objectives through data collection and to test the robustness of the legitimacy dialogues model outlined in Chapter 6. The findings for both activities are detailed at length.

Chapter 8 reviews the findings from all of the preceding chapters to discuss the key research findings generated by the thesis, the usefulness of the thesis' approach and the success of the thesis in satisfying the research objectives.

The final chapter, Chapter 9, states the main conclusions of the thesis and examines the implications of the research findings. Finally, a summary of future research options are outlined.

1.10 List of book chapters, journal articles, conference papers, poster presentations generated by this thesis

Book chapters

Jeffrey, P. & Gearey, M. (2004) Consumer responses to water conservation policy instruments: a literature review and some comments on emerging theory. In Butler, D. & Memon, F. (eds) *Water Demand Management*. IWA Publishing. London.

Tur, A. A., Noguera, G.O., Jeffrey, P., Gearey, M., Rinaudo, J.D., Coubier, S., Veljanouski, T. and Ravbar, N. (in press). Socio-cultural influences on water utilisation: a comparative analysis. In: *Water management in arid and semi-arid regions: interdisciplinary perspectives* edited by Koundouri, P et al. Edward Elgar, Aldershot.

Journal articles

Gearey, M. & Jeffrey, P. (Forthcoming, December 2005). 'Domestic consumer perceptions of the legitimacy of water resource management options: a case

The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

study of the River Nene catchment, UK'. *The Journal of the Chartered Institution of Water and Engineering Management.*

Jeffery, P & Gearey, M (2004). Integrated water resources management: Lost on the road from ambition to realisation. Proceedings of the 6th International symposium on systems analysis and integrated assessment in water management. Beijing, China, 3rd to 5th November 2004, p 3-10. In press, *Water Science and Technology.*

Gearey, M. & Jeffrey, P. (Under review). Concepts of legitimacy within the context of adaptive water management strategies. *The Journal of Ecological Economics.*

Conference papers

'Legitimacy and policy tool development in the context of water stress'.

Presented at a Newcastle University seminar on water governance held on December 16th 2002

'Legitimacy and efficiency of water governance regimes; an emerging agenda to support policy tool development'. Presented at the International Water Association (IWA) 'Efficiency 2003' conference in Tenerife Spain 2nd and 4th April 2003

The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

'Integrated Water Resources Management: lost on the road from ambition to realisation'. Joint author with Dr Paul Jeffrey. Presented by Dr Jeffrey at the International Water Association's November 2004 conference in Beijing China.

'Efficiency of water governance regimes; an emerging agenda to support policy tool development'. Presented to the Council of Scientific and Industrial Research, Pretoria, South Africa, August 17th 2003.

Poster Presentations

'The AQUADAPT project'. Presented at the IWA's 'Sustainable Water for Africa' conference, held in Cape Town, South Africa between 14th and the 18th September 2003.

'Championing good governance through an appreciation of legitimacy dialogues'. Presented at the Swedish International Water Institute's World Water Week August 16th – 22nd 2004.

Chapter 2: Legitimacy, Integrated Water Resource

Management and adaptive capacity; a literature review and consideration of central concepts

2.1 Introduction

Chapter 1 has already outlined the main thrust of the research. To recap; there is a gap in our understanding of the potential impact of water stress on the relationships between water users and governance bodies. It has been argued that exploring the role of legitimacy within these relationships may provide insights as to which strategies and policies could be adopted to help develop successful approaches to ameliorate or lessen the impacts of water stress.

Section 2.2 will examine legitimacy as a concept within political theory and sets this discussion within the wider context of scholarship on Integrated Water Resource Management (IWRM) and legitimacy. It will be argued that it is necessary to refine the concept of legitimacy to enable it to be used in the context of water management. The notions of 'input' and 'output' legitimacy will be presented as central to this understanding. These terms will be employed to examine the conditions necessary for effective policy implementation. The concept of legitimacy dialogues is then introduced as a means of articulating the complex ways in which the legitimacy of water

management is articulated within contemporary natural resource management contexts.

Section 2.3 deals with the effects of the privatisation of water management and the 'commodification of water'. This section presents an overview of the background issues associated with the legitimacy concerns inherent to the new water management regime. The final sections of the chapter will return to, and elaborate on, the insight of Section 2.2 in showing that, as far as IWRM practices are concerned, legitimacy is bound up with interactions between actors in networks of relationships. This, in itself, returns to notions of adaptivity outlined in Chapter 1 and described in more detail in Section 2.4. For adaptive policies to be effectively negotiated and deployed these networks need to be more clearly understood.

In summary, we need to comprehend: (i) the diversity of actors with a stake in water resource management, (ii) the types of relationships that exist between actors, and (iii) the responses available to respond to water management challenges. Understanding these factors not only creates a broad ranging legitimacy agenda, but also exposes gaps within the contemporary discourse on legitimacy. Section 2.5 concludes the chapter with a section that outlines the research questions of the thesis that relate back to these key concerns.

2.2 Rethinking legitimacy

Legitimacy explains the negotiation of power relationships between actors and between actors and institutions. Power is understood as the ability to make decisions that relate to the deployment and management of socially and economically valuable resources. A distinction can be made between formal and informal legitimacy. Formal legitimacy describes whether or not a decision or act has been carried out with reference to a procedure or set of rules that determine the outcome as lawful or unlawful, correct or incorrect, acceptable or unacceptable. These rules could be legal rules stemming from legislation or judicial decisions; conventions of governmental practice or even management norms developed within an institution. Informal legitimacy can be contrasted with formal legitimacy. It tends to be associated with social customs and practices (although as argued in Chapter 1, it may be connected to a perceived expertise or success as a pressure group or citizens group in altering policy or influencing a policy decision). The interface between these two modes of legitimacy will be explored later in this chapter. Legitimacy, then, is bound up with accountability and adherence to recognised norms.²⁰

²⁰This, however, does not exhaust the range of meanings associated with legitimacy. Legitimacy as freedom, or autonomy, is initially found in the work of Hobbes (1996). Legitimacy as the passing up of some individual freedom for a greater collective freedom is explored in a different way through Rousseau's (1994) notion of the 'social contract'. Perhaps the most influential account of legitimacy can be found in the work of John Rawls (1999). The concept receives a different emphasis in the philosophical anarchism of writers such as Godwin (1979), Nozick (1974) and Flathman (1998). Although there is an anarchist tendency within liberalism, its influence should not be underestimated. Anarchist or libertarian articulation of notions of legitimacy as absolute freedom can be seen, at a certain level, in the discourse of neo liberalism and the championing of small government. These understandings of legitimacy remain peripheral to the present project.

The most obvious, and hence most cited, example of formal legitimacy is the creation of a contract. A contract is evidence of an exchange between parties. A contract's legitimacy is derived from the fact that the relevant parties have entered into it of their own freewill, and accept the rights and obligations that the contract defines. In a broader sense, modernist political theory has presented the contract as underpinning government. An elected authority utilises the political and moral power 'contractually granted' to them by the electorate.²¹ Government is deemed legitimate to the extent that it remains in accordance with the terms of the contract. This is not to say that an actual contract underlies government; rather, the idea of contract provides an interpretative device to explain a notion of democratic government that operates in accordance with rules and is seen to be based on the delegation of power from the electorate to a political party that is ultimately accountable to 'the people.'²²

²¹ See Hobbes (1996) and Locke (1998). These philosophers viewed legitimacy as an act of liberation from insecurity and anarchy. See also Rousseau's concept of the 'social contract' (1994), a mutually beneficial exchange of right and privilege.

²² It is also necessary to point out that legitimacy as an historical phenomenon is bound up with the idea and justification of the state. We need to briefly engage with this theme to see how modern modes of legitimacy have moved away from an exclusive reliance on the state or state institutions and actors. In one of the most influential accounts, legitimacy is articulated as the bond which ties the state to civil society within a nation state. The state is defined as holding a "monopoly on the legitimate use of physical force within a given territory" (Weber, 1948, p.78). The state's claim to a monopoly on force is characteristic of the very nature of the political, which is concerned with the "distribution" of power amongst groups within a state. Legitimacy is primarily a support for the "domination" of the state; a domination that is considered as inherently violent. (Weber, 1948, p.78).

Formal legitimacy would also cover the concept of procedural legitimacy. A decision or act is legitimate to the extent that it was carried out in accordance with the relevant parameters, rules or protocols.

Legal theory can illuminate these ideas. Law can provide formal legitimacy because it articulates neutral, rational principles that can allow a negotiation between conflicting values. The work of Raz (1988) is exemplary of this approach. Legitimacy is depicted as enabling; it provides mediation between citizen's desires and the limits of practical authority. These ideas build on the influential positivist philosophy of Hart. Hart provides an account of legal rules as a structure that legitimises authority and enables the development of modern, secular legal orders (Hart, 1997). Both Hart and Raz cite legitimacy as central to a society that organises, develops and reproduces itself.²³

This suggests that legitimacy is linked to the "belief in the validity of legal statute and functional 'competence' based on rationally created rules."

(Weber, 1971, p.79). Obedience is a phenomenon of following enacted rules.

In its most extended form, and implicitly linked to a notion of the state, this

means that: "Organised domination, which calls for continuous administration,

²³A model of legitimacy as integrative can be found in the work of Ronald Dworkin. Dworkin (1996) places legitimacy firmly within a notion of rights. Law is legitimate because it is a coherent, integrated structure of rights and principles. This rationalist reliance on rights provides a platform through which different types of society can find commonality. For Dworkin the law is a seamless web of authority. Through the interpretative skills of judges, a "right answer" can always be found to resolve the social problems that law is asked to adjudicate. Law is thus essentially a way of balancing competing interests by reference to fundamental principles. These principles are either contained in the constitution, or, as is the case with the United Kingdom, a product of the common law, and its development over time.

requires that human conduct be conditioned to obedience towards those masters who claim to be the bearers of legitimate power.... Thus organised domination requires the control of the personal executive staff and the material implements of administration." (Weber, 1971, p.80). Legitimacy then is a tool used by the state.

This account of formal or procedural legitimacy describes a feature of the modern, bureaucratic state. However, the passage above does not stress the degree to which the contemporary state delegates its power and administrative duties. The decisions of regulatory bodies, for instance, are largely structured by discretion, and, perhaps only in the last instance, refer back to law. These bodies of course play a role in the water industry. Policy making government departments, regulatory bodies, and quasi autonomous non governmental organisations (QUANGOs) still relate to the notion that they are legitimate because they adjudicate by reference to principles, even though these principles may not be strictly legal, they are still normative. Understanding the governance of water means appreciating the role that the state plays; and the extent to which this role is seen as legitimate because it follows determined legal procedures.

However, legitimacy is not restricted to formal ideas of public or private law. Legitimacy also operates informally through norms, customs, traditions and shared values (Douglas, 1986). Modes of informal legitimacy also include familial or tribal custom, NGO activity, community representation and

accepted social practises (Chambers, 1983). Informal legitimacy still describes whether or not a decision or act is right or wrong, moral or immoral, sacred or profane by reference to rules or codes that may or may not take a written form. In distinction to formal legitimacy, it could be argued that informal sources of legitimacy do not have the force of law, in that a court may not award a remedy for their breach.²⁴ Informal legitimacy may be quite diffuse, and exist in perceptions and desires. Indeed, strong informal legitimacy may be marked by an implicit acceptance of events, acts or decisions which are culturally entrenched.

The distinction between these two modes of legitimacy is difficult to draw. Informal modes of legitimacy may become formal and informal codes may be backed up by formal rules. The two modes of legitimacy can become entwined over time.²⁵ One of the problematic areas to which this thesis will return is precisely this relationship between formal and informal legitimacy. It will be suggested that one of the most pressing concerns is the extent to which these modes can be made congruent. Legitimacy has been presented primarily as a concept that refers to the state.²⁶ Yet this means legitimacy is

²⁴ See also the writings of communitarians, in particular, the work of Taylor (1992) and MacIntyre (1987). This approach favours social duty. Rights must be understood in this context. Legitimacy is established and operationalised through a shared focus on community, with the family, rather than the state acting as the primary source of moral and ethical guidance.

²⁵ This developmental or temporal aspect of legitimacy is central to Weber's influential typology. The root of legitimacy can be traced back to traditional authority, followed by charismatic authority; leading to legal legitimacy in which power becomes cemented within the state.

²⁶ See Habermas (1976). Habermas argues that only political orders can gain and lose legitimacy. Multinational corporations or the world market are not capable of legitimacy" (Habermas, 1976, p.179). It is important to point out here that this is one

too narrowly defined. Within the modern era legitimacy can equally be applied to the actions of non-state actors. Indeed, the contemporary scholarship on legitimacy describes the interweaving between the state, the private sector, and multi-national corporations. Contemporary accounts of legitimacy (Beetham, 1991; Browning, 2000) do indeed show non state actors seeking legitimacy, shown by their appropriation of discourses of legitimacy, in order to justify their own policies and activities. The early work of Greenpeace is a clear example. In other words, we need to be critical of a model that ultimately sees legitimacy only in terms of political sovereignty. Legitimacy therefore is also associated with institutions, NGOs and individual actors.

It will be argued throughout the remainder of this chapter that to understand the role legitimacy plays in the relationships between water users and governance bodies, there needs to be an appreciation that issues of legitimacy concern private as well as state actors. In other words, legitimacy also operates within and between civil society actors. To elaborate an understanding of the relationships between the diverse actors at catchment level, the concept of legitimacy dialogues will be used (see Chapter 6). It will be seen that the key challenge is to appreciate that legitimacy is a way in which state and non state actors 'talk' both to each other, and to those affected by their actions.

of the points on which his theory of legitimacy is far too limited. This may be an effect of his reliance on a rather limited Marxist notion of the state.

So, how is it possible to think about legitimacy in the context of the management of a natural resource like water? Furthermore, is it necessary to make use of a different vocabulary than that used to describe legitimacy and political sovereignty? The discussion of the notion of governance, detailed above, is one element of this new analytical language. As suggested, this moves the literature concerning legitimacy away from notions of sovereign political power and towards a more expansive understanding of the concept.

However, equally important is the appreciation that legitimacy in the context of IWRM demands a vocabulary orientated around effectiveness or efficiency. Water users perceive that the decisions and policies of institutions dedicated to regulating the water sector, and, also to some extent the actions and decisions of other informal governance bodies, are themselves legitimate to the extent that they are effective. Chapter 5 is dedicated to an empirical piece of research that attempts to isolate and focus upon issues of efficiency, trust and legitimacy in relation to the use and governance of water in the Nene catchment.

However, effectiveness is not the only relevant factor. It is possible to make a distinction between 'input legitimacy' and 'output legitimacy' (Scharpf, 1999). Input legitimacy relates to the way in which a policy, institution or decision has been formed. Thus, constitution through law or public support would give an institution a strong input legitimacy. Similarly, a policy or decision which has a clear rationale, or was supported by public will, would also be deemed to have

a high input legitimacy outside of its actual success at the implementation stage. Expertise developed over a number of years could also be significant in lending an organisation strong input legitimacy, even if this organisation sits outside of a formal framework, for instance a charity or NGO.

Output legitimacy relates to the perceived success of the decisions that an institution takes, or equally the outcome of a policy or decision process. If they are generally deemed to be successful and well directed, then they will gain a great degree of output legitimacy. Indeed, it is possible to refer to this as the 'social legitimacy' (Schimmelfennig, 1996) of a decision or an act that has both strong input and output legitimacy. Relationships characterised by cooperation and mutual respect might be described as enjoying strong social legitimacy. Efficient bodies with a record of expertise and successful response to events can also be described as having strong social legitimacy.

Thus, to understand legitimacy as a concept in relation to water management, it is necessary to examine the relationships within and between water users and governance bodies in order to understand in more detail the degree to which these formal and informal interactions are being conducted in an efficient and effective manner; in other words to ask questions that relate to social legitimacy or the conjunction of input and output legitimacy. These questions are returned to in detail in Chapter 5.

Essential to legitimacy is the concept of trust. Trust can be imagined as a component of input and output legitimacy. There is a large literature on trust (Sztompka, 1999; Misztal, 1996; Bourdieu, 1977) as a political and social concept, but, the understanding of the term in this context of the research has to be seen as quite specific. As will be shown in later chapters, trust is relevant in this thesis to the extent that it describes informal interactions between water users and governance bodies. For instance, trust underlies perceptions of the water companies' ability to provide safe tap water of an acceptable quality; and also to respond to issues of importance such as flooding. Trust also underpins negotiations between water user associations and governance bodies during consultation exercises. Trust, then, is to be understood as an element of broader perceptions of efficiency and effectiveness in water resource management. This concern with identifying the specific components of legitimacy is explored in more detail in Chapter 7 through the development of the concept of legitimacy dialogues. It is enough to say here that legitimacy dialogues will be utilised in an attempt to characterise the relationships of mutual dependence, co-operation and contention that typify relationships between state and non state actors in water governance (and are also explored further in Chapters 5, 6 and 8) within the Nene catchment.

Characterising legitimacy in terms of discourses of trust or effectiveness is not meant to conceal an important element of legitimacy that has been touched on only briefly so far; that of power. Although a working definition was

suggested above, power is a difficult term to describe. For many theorists, such as Habermas and Barker, legitimacy and power are synonymous. From this perspective, legitimacy is always a negotiation between interest groups and central government over the management and allocation of resources. If it is possible to suggest that legitimacy involves the weighing and judging of various influential or powerful claims, then this process can involve more or less powerful actors; that is to say actors with greater and lesser abilities to influence the control of resources.

An example drawn from the wider literature can illustrate what is at stake in this process. Allan (1999a) describes the presence of a 'sanctioned discourse' of water management. The nature of this sanctioned discourse relates to broader issues of political power. For Allan, the political costs of addressing the reality of national water shortages sets the parameters of what appears on political and public agendas. Issues of water stress are rendered silent due to the practical limitations that politicians face in policy making: 'Their options are sanctioned. They have limited free will. They take the only option which has no political price in the short and medium term at least' (Allan, 1999a, p.75). Water stress then is rendered silent due to the practical limitations that politicians face in policy making. This is an illustration of one of the broader political concerns thrown up by water management and governance.

2.3 Privatisation, legitimacy and IWRM

If we are concerned with relationships between water users and governance bodies then we have to be clear about the political nature of water. This section will overview three inter-related arguments that, whilst not central to the work undertaken in the Nene catchment, are important to an understanding of water politics and some of the broader themes generated by this thesis. It is important to appreciate that water is not simply a national resource; that IWRM regimes provide the underpinnings for practices of water management and that, especially since privatisation, water is a commodity.²⁷

Water cannot be treated solely as a national resource, as it exists within a global hydrological cycle. Furthermore water management operates outside of national boundaries through a complex of transboundary institutions, codes of practises, multi-sited secretariats and treatise. This means that it is necessary to consider not only a country's institutional water management system and water pricing ethics, but also to take into account transboundary relationships and the way in which water stress could well develop into a common problem,

²⁷ There is part of a wider literature on the value of water. (Carson, 1962) sees water only as an environmental good. However, there are those who maintain it is a cultural good (Strang, 2001); an economic good (Winpenny, 1994) or a social and public good (Trottier, 1999). For a convincing argument that water is also a political commodity, see Allan et al (Allan 1999b; Gleick 1998; Reisner, 1993; Turton, 1999b). These different perspectives share a desire to ensure equity of access to water, for all people, for the environment and for future generations.

even for water rich countries. One country's failure to deal with water stress could well have an impact on other countries – either through rising food prices, social diaspora, economic slowdowns or water conflicts.

These issues suggest the scale of the problem that might occur if the issue of water stress is ignored. However, a concern with the role that legitimacy plays at an international level would make necessary a potentially huge research remit. These broader themes must, then, remain in the background of this work. It is useful to bear in mind, however, the sense in which the local and the international are increasingly mutually influencing.

It is also necessary to understand the present IWRM regime of water management as an aspect of a broader politics of water. Water stress has to be conceived against this backdrop, as it conditions the expectations and assumptions of water users and governance bodies. This analysis will now be developed by looking at IWRM approaches to water management in more detail.

IWRM in essence aims to co-ordinate the multiple uses of water to ensure unity of environmental care and future integrity of the resource. The formal recognition of a planned, holistic approach to water resources management has been adopted at different tempos in different countries. In England and Wales, for example, IWRM principles lay behind the creation in 1973 of ten water authorities that undertook the management of entire river catchments.

These bodies replaced the former agencies who undertook small, specific functions of pollution control, abstraction rights and storage facility development. The water sector became privatised in 1989 and IWRM became embedded within new institutions – private water companies²⁸ regulated for price, water quality and environmental guardianship by the Office of Water Services (Ofwat), the Drinking Water Inspectorate (DWI) and the National Rivers Authority (NRA) which later became the Environment Agency (EA).

IWRM operates within a closely defined arena in developed economies, its trajectory mirroring the rise and fall of the 'hydraulic mission' (Reisner, 1993). As IWRM became a necessity, as managing political economies became more complex, so the advent of post-industrial societies and growing water stress reveals gaps in the ability of IWRM's demand management approaches to tackle the phenomena of water stress. Specifically, IWRM as a body of literature fails to address the problem of water stress as imminent. Whereas strains on supply is understood in IWRM terms as meaning the diminution of supply headroom at times of peak demands or falling water quality, tackling water stress requires an intellectual shift to recognise that the agenda has moved on considerably from issues of supply reliability to more complex issues of variable water quality, excess and deficit water quantity; a shift which necessitates social, cultural and economic adaptation.

²⁸ These water authorities became Welsh Water, Anglian Water, North West Water, Northumbrian Water, Severn Trent Water, South West Water, Southern Water, Thames Water, Wessex Water, and Yorkshire Water.

If we accept that many developed societies will need to adjust to conditions of water stress this recognition will necessitate a step on from demand management to harnessing adaptive capacity, discussed in the following section. A radical overhaul will need to be executed through long term planning, that involves managers and policy makers at all levels and in all sectors of the economy, society, environment and legislature. Failure to plan may well increase incidences of water stress and affect those most vulnerable to change in any given sector.

IWRM has also had to interface with the process of privatisation. In England and Wales, the commodification of water, has altered the status of IWRM (see Figure 2). Privatisation dynamically shifted the status of water. Rather than a social good²⁹ which had to be nominally priced to cover the costs of carriage and quality control, water becomes a market good and its undertaking a service to be operated for profit. This, in turn, creates expectations of service delivery underpinning assumptions that water users now have the rights and privileges as any consumer. Yet this ignores the unique status of water as a non-substitutable resource.

²⁹ The cultural and social location of water in British society is reviewed by the work of Veronica Strang. See Strang (2001).

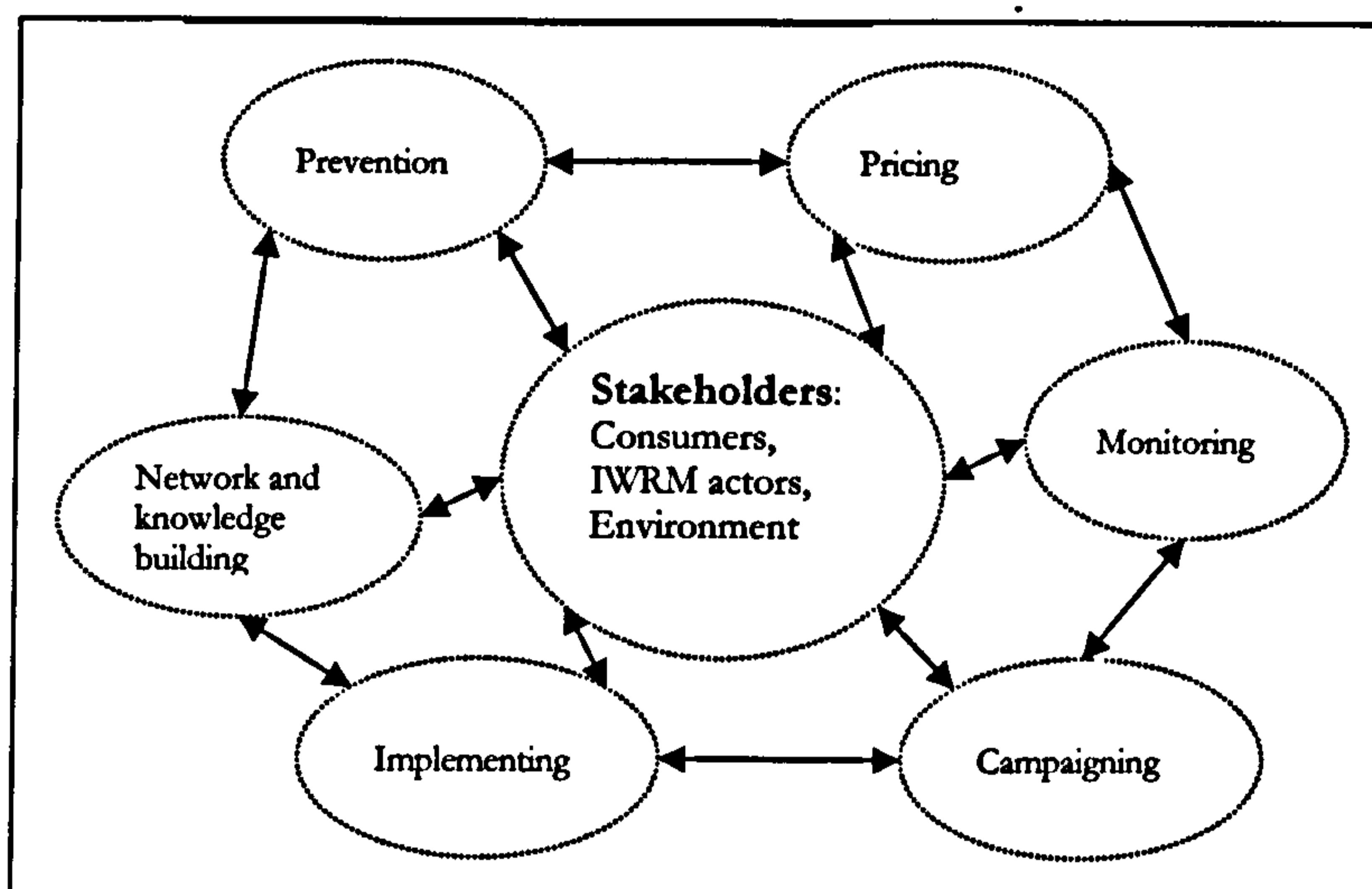


Figure 2: The new exchange of IWRM functions between stakeholders in the post privatisation era of the water sector

This gap between market expectations and natural contingency can be illustrated by comparing public reaction in England and Wales to droughts pre and post privatisation. Whilst pre-privatisation responses to hose-pipe bans and collecting water at stand pipes was greeted with resignation in the 1975/6 drought, the post-privatisation drought orders in 1995 were met with public hostility, media outcries and the flouting of hose pipe bans. The same types of conditions prevailed, the same measures were introduced. The difference was the new water management systems in place – and the new relationships these created.

So where does this leave IWRM in an age of prospective water stress? The current structure of IWRM as a water management model is generally efficient

and a vast improvement on the piecemeal and ineffectual system of its predecessor. However, Europe wide, IWRM has failed to raise in the public consciousness the impending problem of water stress. Rather, the debate still focuses on improving demand management techniques. Climate change is increasingly depicted as the originator of water stress. Although climatic factors do play a role, far more central is the potential inability to adequately manage water resources. Dated infrastructures, consumer resilience to new technologies, flawed pollution control, fragmented management structures, wieldy economic policy and over-consumption all contribute to increased water stress. All these factors, except climate change, lie within the remit of IWRM. IWRM currently lacks an ability, or will, to enable adaptivity to flourish.

There are other problems with IWRM. IWRM's scale is basin orientated and hydrologically centred. However, policy operates at the national, European or global arenas with water operating as a 'multi-dimensional resource enmeshed in nested political economies' (Allan, 2003, p.3,4). Few published studies specifically focus on this tension: the way in which political allocation issues at the macro level have to in some way be managed at the scale of the catchment.

How is adaptation to these problems and tensions to be managed? Can change be achieved? Moreover, how can we make sure that any changes are perceived as legitimate?

2.4 Adaptive capacity and IWRM

Adaptation is the mechanism or mechanisms through which a system, be it a natural or social system, is able to adjust to a changing environment. A central concern of this thesis is the ability of social systems to adjust to change. When talking about societies, people and processes we can talk of their adaptive capacity (Gunderson and Holling, 2002; Ohlsson, 1999) – their ability, either innate, learnt or developed, to mould themselves to the new experiences they confront. We can talk of the adaptive capacity of institutions, schools, the police, the church; the adaptive capacity of processes and the adaptive capacity of people. One hallmark of successful adaptation is the belief in the necessity, fitness or the 'rightness' of the reason for change.

Ohlsson and Turton have written extensively on the concept of adaptive capacity as a scarce resource. In other words, as much as a country can be viewed as naturally water scarce due to climate or topography, so a society's relative adaptive capacity should also be viewed as a national resource. Put slightly differently, natural water scarcity creates 'first order' scarcity whilst a lack of adaptive capacity is termed 'second order scarcity' (Ohlsson, 1999). If adaptive capacity can be understood to comprise of economic, technical, social and political elements, a deficit in any one element can be detrimental to the ability to provide adaptive responses. This creates a balance between 'environmental capital', 'social capital' and economic development (Allan and

Karshenas, 1996; Turton 1999). An imbalance within these three factors requires a paradigm shift in order to return to equilibrium. Turton argues that a recognition that supply sided management regimes are untenable in the long term leads to an appreciation that IWRM is the most appropriate model for water governance regimes.

For Turton, water stress is connected with social regeneration and social stability. In water stressed societies water becomes a tool of the powerful and loses its status as a benign natural resource. Utilising the work of Homer-Dixon (1994) Turton argues that the growing scarcity of water as a natural resource is compounded by the 'ingenuity gap' of many countries which lack the capacity to socially reproduce new technological or institutional solutions to solve water stress. This creates in Turton's opinion 'second order water scarcity' – a lack of social capacity (whether endemic or structured) which compounds 'first order water scarcity' climatic water stress. A lack of adaptive capacity is rooted within societal limitations.

These are urgent issues. So far the problem of water stress in many developed countries has been ameliorated through the expediency of virtual water and the continued reliance on engineering capability. How can the acute nature of the water stress issue be made part of the political agenda? The notion of a threshold point may be relevant. A threshold point describes the point at which social systems break down through a failure of adaptation (see Figure 3, below). Waiting for collapse may be one option; but perhaps

not the most advisable option. Another option may be to avert the political crisis by developing a policy instrument mix which simultaneously alerts actors to crisis but offers incremental policy instruments which help ease the transition from one form of social relationship with water to another.

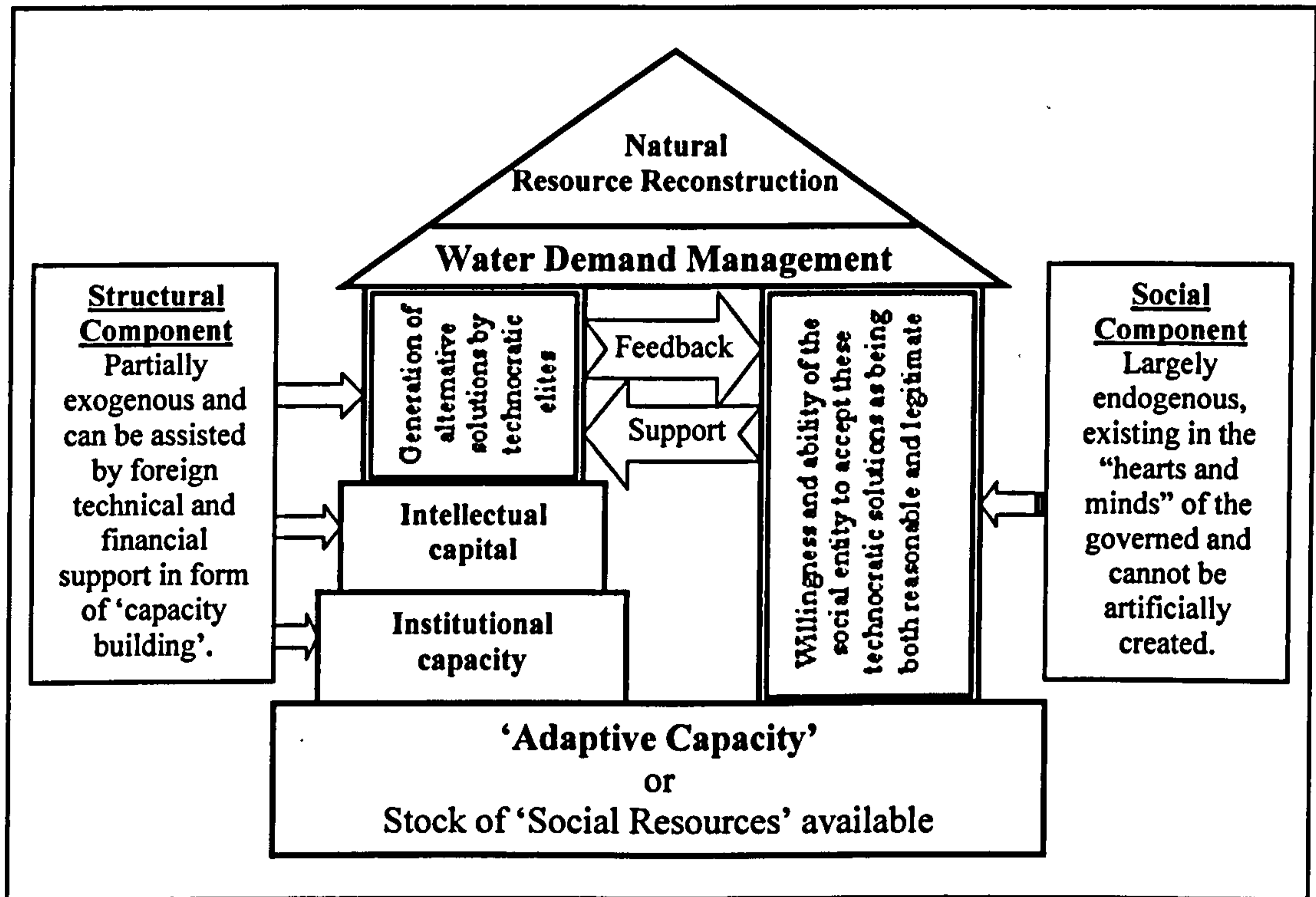


Figure 3: Model linking 'natural resource reconstruction' via water demand management to the 'adaptive capacity' of a social entity.³⁰

In order to address these problems it is necessary to think about IWRM as a regime that brings together various stakeholders to build social resources. These stakeholders can be seen as water users, the various institutional actors charged with overseeing water management and environmental concerns and businesses. Various policy options that are produced by

³⁰ Turton, 1999.

management institutions impact differently on different stakeholders. These stakeholder groups have perceptions of policy that are influenced by their own perspectives, and the relationships that they enter into with other groups. The degree to which policy is considered to be legitimate depends on the perceptions of these policies by each stakeholder. Considering this process from the perspective of IWRM bodies rather than stakeholders, it can be suggested that the legitimacy of policy will depend on the extent to which IWRM bodies can shape or anticipate the legitimacy requirements of governance bodies or water users to assure the successful implementation of its objectives. This concept is explored further in Chapter 7.

2.5 An overview of the thesis and its contribution to the field of water resource management

The consideration of the scholarship to date in these first two chapters has highlighted a number of areas where a knowledge gap exists. Firstly it has been shown in Chapter 1 that water stress is explored at a global, regional or national scale; few available studies appear to have dealt with the impact of water stress on single river catchments, despite the rationale underpinning both IWRM and the WFD that this is the ideal unit for water management.

Secondly, the legitimacy literature has a tendency to focus either on conceptual principles such as bureaucratic and contractual authority or legal responsibility. There is little sense in which legitimacy can be recognised as

present in state–civil society relations outside of formal procedures of representation such as voting. There is no published work available to help understand how legitimacy operates and is negotiated within and between water users and governance bodies. Other areas of legitimacy that deal with practical aspects such as rights over water or the development of water markets also do not explain how decisions come to be accepted over time by water users. There is then a gap in the articulation of how legitimacy is negotiated between different stakeholders.

Lastly, adaptive capacity research does not consider how communities should prepare for change before water stress reaches the public agenda. This thesis hopes to contribute to this literature by engaging with this theme. It is clear then that the current literature does not adequately address the research issue outlined by the thesis. There is also the need to develop a methodological framework along with empirical research to help address this knowledge gap; these issues are dealt with in Chapters 3, 5, 6 and 8. In order to close this knowledge gap, the research proposes the following research questions aimed at satisfying the thesis objectives. The overarching thesis research questions are outlined, followed by the questions pertinent to each of the fieldwork activities detailed in chapters 5, 6 and 8.

In order to close this knowledge gap the research proposes the following research questions aimed at satisfying the thesis objectives (see Table 1). These are described below, and then linked to fieldwork activities 1, 2 and 3.

The overarching thesis research questions are outlined and the research questions pertinent to each of the three fieldwork activities; the Fenland scoping study, the household questionnaire and the structured interviews detailed in Chapters 5 and 7. The development of the legitimacy dialogues model is specific to Chapter 6.

Thesis Objectives	Research Questions
<i>To identify the presence or absence of legitimacy in current relationships between water users and water governance bodies at a river catchment scale.</i>	Is legitimacy present or absent in current relationships between water users and governance bodies along the River Nene corridor?
<i>If it is possible to identify legitimacy as operational, to then examine how and where it operates at the river catchment level. In particular the research is interested in exploring the interaction between formal and informal processes of legitimacy at the basin scale.</i>	What are the different needs and expectations of water users and governance bodies in relation to their existing use of the River Nene catchment?
<i>To explore the dynamic that exists within and between water users and water governance bodies in order to assess how water stress may alter these relationships.</i>	Can strengthening legitimacy enable a broadening in response envelopes to allow for more adaptive policy tools to cope with water stress?
<i>To assess the potential adaptivity of these two stakeholder groups to emergent change; what is their potential receptivity to</i>	What policy options to combat water stress are water users and governance bodies willing to consider?

<p><i>new policy options and management strategies to accommodate water stress.</i></p>	
<p><i>To document what policy and planning options water users and governance bodies themselves forward as possible strategies to combat water stress at the catchment scale</i></p>	<p>Are the institutions, organisations, agencies and bodies responsible for the governance of water resources and water services in the River Nene catchment potentially adaptive to water stress?</p>

Table 1: Thesis objectives and research questions

Fieldwork Activity 1: Informal scoping interviews conducted within the Fenland region of the River Nene catchment (Chapter 5).

The scoping interviews used six generic themes as a way to shape the interviews:

1) Flooding – How strongly do stakeholders perceive a risk of flooding? Do they have experience of flooding? What types of flood warnings or flood controls exist and what would stakeholders like to see implemented? What shapes local flooding: is it a seasonal event, mainly freshwater or seawater flooding or attributable to, land use regimes?

2) Drought – How strongly do stakeholders perceive a risk of drought? Do stakeholders have experience of drought? What types of drought orders or drought controls exist and what would stakeholders like to see implemented? What shapes local drought events: are they seasonal or attributable to land use regimes or consumer use?

3) Water quality – Do stakeholders feel that water quality has improved or declined in recent years? What specific pollutants impact on local water quality? Is there enough water quality testing carried out? Is there enough access to information on water quality?

4) Governance – What organisations are the stakeholders aware of? What do they perceive as the role of these organisations? Are these public, private or civil society based organisations? Is there connectivity between organisations? Are they individually or collectively effective?

5) Local agenda – What dominates the local agenda? What do stakeholders feel should be given more weight? How might changes be better managed or vocalised?

6) Economy – Have stakeholders' livelihood been affected, positively or negatively, by changing conditions on the Nene? Are other issues more pressing – or is there connectivity?

Fieldwork Activity 2: A household questionnaire based survey of domestic water user attitudes to water management issues conducted along the River Nene catchment (Chapter 5).

This household based fieldwork sought to address the following five specific research questions:

- 1) What are the dominant perceptions that consumers hold with regards to current water provision in terms of service, value, quality, safety and reliability?
- 2) Are consumers aware of any recent changes to their water environment (e.g. increasing water stress)? If so, is it possible to catalogue these changes e.g. in terms of rate of change, cause of change and effect of change?
- 3) What range of possible future water policy options to ameliorate water stress are consumers willing to accept?
- 4) Post privatisation of the sector, do consumers view water governance bodies as a coherent set of institutions?
- 5) Is it possible to discern the existing nature of legitimacy relationships between water users and governance bodies through isolating contributory issues such as trust, communication, longevity, safety and policy innovation?

Fieldwork activity three: Structured interviews with water governance bodies and water user associations to discuss strategic planning along the catchment using water stress scenarios (Chapter 7)

This fieldwork utilises two waters stress drivers using pre seen questions (see Table 2 below).

Flooding scenario	Rapid development scenario: Milton Keynes quadrangle
<p>1) From your organisation's perspective what causes flooding along the River Nene?</p> <p>2) What are the solutions to flooding along the catchment?</p> <p>3) Who or what should provide these solutions – and is this institutional mix currently in place?</p> <p>4) What prevents or may hamper this institutional mix from developing solutions? (e.g. time, expertise, resources).</p> <p>5) What does your organisation believe needs to be done at the catchment level to lessen the risk of flooding?</p>	<p>1) Do you think that the proposed rapid urban development will have a significant impact on the river and, if so, why?</p> <p>2) What will be the benefits and costs (e.g. environmental, social, and financial) at catchment level of such development along the river?</p> <p>3) Which organisations are championing these development plans?</p> <p>4) Does your organisation feel the appropriate people and institutions at catchment level have been consulted and involved in the strategic planning stage?</p> <p>5) What outcomes would your institution like to see with regards to this proposed Milton Keynes quadrangle scheme?</p>

Table 2: Structured interviews scenario questions

Chapter 3 will discuss the methodology which underpins the research stages of this thesis.

2.6 Conclusion

This thesis attempts to address the emergent phenomena of water stress within the context of existing relationships between water users and governance bodies. It will make use of the concept of legitimacy. This necessitates an interdisciplinary approach where natural resource management concerns are married with political science interests and political philosophy.

In summary, this chapter has argued that new approaches to resource management and the commodification of water demand a widening agenda for legitimacy. Legitimacy is not just to be found in accounting for the activities of the state, the civil service, government agencies and the judiciary. Nor is legitimacy simply to be associated with the actions of private companies that seek to justify policy and pricing by developing strong relationships with citizens through mutual collaborations with Non-Governmental Organisations (NGOs) and Community Based Organisations (CBOs). What must be explored are the complex interactions between a wide variety of actors engaged in dynamic social and economic relationships. These complex negotiations of power and authority will be addressed in this thesis through a notion of 'legitimacy dialogues' where accountability and the justification of decisions and acts are inseparable from diverse questions of efficiency, scientific practice and controlled and accountable use of resources.

At the close of this chapter it is worth mentioning that no literature connected with sustainable development have been cited. This is a deliberate strategy. This thesis makes no reference to sustainable development, simply from the practical approach that such a discussion would move the focus from the research problem area. Adaptive capacities are inherently linked with 'sustainability' research and continuity. Since this thesis is thinking widely around issues of water stress, and approaches to ameliorate water stress, it is clear that a pro-resource outcome is the natural desire of this work.

Chapter Three: On methodology; journeys from ideas to evidence

3.1 Introduction

This chapter outlines the general methodological approach adopted throughout the thesis. Section 3.2 presents the thesis as organised around a reflexive process. Theoretical concepts and empirical fieldwork are iteratively reviewed as part of a dynamic process in which fieldwork research and conceptual development are refined and gauged against the aims of the thesis as a whole. This facilitates a broad consideration of key concepts central to this thesis, namely understanding the social world, legitimacy and the different policy outcomes generated by concepts of government and of governance. Having explored this process in some detail, Section 3.3 goes on to address the nature of the project as social scientific inquiry. Although the empirical techniques to be used are rigorously designed and enable the researcher to present an objective knowledge of the social world, the assumptions underlying the work remain essentially value choices. This section articulates the challenge raised by social enquiry techniques, namely interpretation and validation of different social science methods. Elaborating this point, Section 3.4 goes on to engage with the 'hydropolitical' agenda that can be found in the work of Allan and Turton, and shows how it is relevant to the design of empirical questions.

Section 3.5 outlines in greater detail the empirical methodology. The approach utilises a variety of qualitative data collection techniques including formal questionnaires, informal face to face and telephone interviews and structured interviews with institutional representatives and stakeholders. As argued above, there is an iterative element to the empirical methodology: each of the research questions or assumptions outlined in Chapter 1 are 'tested' through fieldwork, so those concepts and assumptions are reviewed and taken into the field again. The chapter concludes by relating the empirical research back to the project's grounding assumptions.

3.2 The reflexive structure of the thesis

This section will explore the methodological concepts that underpin the research enquiry. Examining the role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress is essentially a social enquiry; these relationships do not exist in the natural world. This thesis is then a contribution to social enquiry.

The thesis is interested in exploring a set of relationships that cannot be reduced to a simple model.³¹ there is no simple way to identify legitimacy

³¹ This project is also rooted in a hermeneutic approach to social science. It is necessary to briefly outline the assumptions of this approach. Hermeneutics begins with an understanding of the 'universality of language' (Gadamer, 1989). This means that we are always within language; the world cannot be observed from some neutral position. Hermeneutics thus views the humanities and the social sciences as interpretative in nature. The second fundamental assumption made by hermeneutics is the historical nature of interpretation. Interpretation always takes place against a tradition or traditions. The interpreter is never alone, but located within a history that

operating within social relationships. Informal legitimacy appears to be identifiable by the absence of instability of social relationships. This makes it more difficult to 'plot' than a phenomenon with a set of explicit indicators. Moreover, given that legitimacy simultaneously operates within formal and informal modes simply adds further complexity as to how a single piece of research may identify and validate its existence. The challenge for the thesis is to thus develop an approach which clearly details what type of data can be generated through social enquiry. Yet this complexity provides an opportunity to make a contribution to social enquiry by combining empirical fieldwork with novel theoretical development.

The theoretical approach that supports this work can be broadly defined as multi method.³² This is because the research methods employed to satisfy the research questions combine multiple social enquiry techniques to provide an approach that is both exploratory and flexible. The overarching objective is to address the concern depicted within the thesis title. Each of the three

makes the individual act of interpretation possible. Interpretation is always a fusion of the horizons of the interpreter and the traditions of interpretation. The third condition of interpretation is the dimension of conflict that is an irreducible feature of acts of interpretation.

³² More precisely, it rests on a hermeneutic methodology that is congruent with an interpretative approach to the social world. The origin of hermeneutics comes from the ancient Greek *hermeneuo*, meaning both interpretation and explanation (Tontti, 2004, p.7). For an understanding of why a hermeneutic theoretical approach appears to be the most suitable for this thesis it is important to contextualise hermeneutics itself as a school of thought. Hermeneutics develops from the work of German theologians from the 17th century which sought to uncover the authority of biblical texts. This search for theological authority developed in modernity into wide ranging debates over meaning and validation. Hermeneutics prompts the social scientist to acknowledge the inherently interpretative nature of their task. Again, this does not leave social science as unbounded or anarchic. Understanding or interpretation is itself guided by the structures of historicity outlined in the footnote above.

fieldwork research activities undertaken is reviewed in light of the research questions and this reflexive process enables the next research activity to be shaped. This means that each of the fieldwork activities were reviewed and evaluated as an element of this reflexive process enabling an approach which evolved throughout the research for the thesis. This provided a reflexive and iterative direction to the empirical fieldwork, as each round of data gathering helped to build a more complex picture of the subject matter under investigation. This has allowed the thesis to approach research problems that are attendant on studying both textual data (e.g. formal interviews analysed by verbatim transcripts) and non textual accounts (e.g. informal face to face and telephone interviews) of human action.

This approach is deliberate, because the nature of the data on which analysis can reflect is not clear until it has been uncovered by the fieldwork. The findings may lead the thesis to modify or question the concepts with which it started and which underpin the analysis. This 'learning by doing' approach is thus anchored by an ongoing and structured reflection on the thesis' grounding assumptions and objectives.

Underlying this approach is also the presupposition that the social world is coherent. Without sketching a more comprehensive history of the social sciences, this is a difficult idea to explain. However, the key assumption is that all social actors are rational and will follow rational strategies to fulfil their objectives. This presupposition of rationality in social enquiry techniques is

essential, because the interpretation of the results of the empirical fieldwork relies on the assumption that both actors and institutional decision making is rational. Moreover, empirical interview techniques also presuppose that those interviewed answer questions in good faith, and are rational actors capable of understanding their behaviour and explaining it to others.

3.3 Social science, value bias and objectivity

The study of water stress as a social, economic and political issue demands a brief review of the dichotomy between the natural and social sciences. This review is also made necessary by the need to engage with the cross disciplinary nature of this thesis. As suggested in the previous chapter, work on water stress requires natural and social scientists to work together. It is thus crucial to be clear about the assumptions that underlie social science, and to elaborate the way in which it can provide knowledge of the social world. What is the nature of the knowledge that social science makes available?

There has perhaps been a central tension in the philosophy of the social sciences: one approach has been to conflate social phenomena with natural phenomena, 'causally determined physical events' (Schutz, 1972: p.3), another has preferred to understand social phenomena as belonging to a cultural world that cannot be understood in the terms of the natural sciences. For the latter position, the issue has been the extent to which the political or

intellectual values held by the individual researcher have compromised the nature of his or her findings.

There was a profound need, then, for a secure foundation of the social sciences. Weber's work is central to the provision of this new foundation (Weber, 1949, p.51) and allows an elaboration of the basic suppositions of a social science.³³ Weber's 'interpretative sociology' (1949, p.56) founds itself on a neutral empiricism; an observation of social behaviour that attempts to be as value neutral as possible. Weber sought to construct a system of thought which would enable research into the social world conducted within a framework as rigid as that adhered to by natural scientists.

This project seeks to make use of empirical techniques that are as free from bias as possible. In short, it attempts, at this level, to be value free. However, social science is not natural science. A social researcher cannot claim that their work is entirely free of influences and value choices. Social research must indeed proceed with certain suppositions about the values that inform its practise.

One of the grounding assumptions of this thesis is that water stress will, over time, increasingly become a pressing concern for many developed countries.

³³ Weber is taken as the starting point due to the recognition that his work is the foundation of modern sociological enquiry. This is not to say that social enquiry per se originated at this point. We can trace an ancestry through Rousseau, John Stuart Mill, Locke and Hobbes right back to the writings of Aristotle. For the sake of brevity, Weber's work is seen as presenting a key focus for the problems of sociological enquiry.

Water stress will be experienced differently by different populations; consequently impacts of water stress will be similar though not uniform. Furthermore, the idea of water stress is presented within this thesis in such a way as to enable the research to hypothesise about the phenomena of water stress as located within social relationships. It can be compared to the assumptions that are made about the functioning of the market in classical social research. The ideal market is understood as a coherent system. This does not 'exist' as such. No claim is being made that one could 'discover' a perfectly functioning market in social reality. Water stress posits an "objective possibility" on the basis of those features which imaginatively appear as plausible. Plausibility relates to the extent to which the assumption that has been made can reveal the 'interdependence' of social phenomena (Weber, 1948, p.92). The assumptions may or may not correspond to ideas or ideals actually in the minds of and motivating social actors. Such a relationship may exist, but it is not absolutely necessary.

It is not just that the conclusions of sociological research are contentious; the 'empirical science of concrete reality' (Weber, 1948, p.72) is always necessarily limited. This is the problem of the imposition of a frame on the social phenomena under study:

'How is the causal explanation of an individual fact possible- since a description of even the smallest slice of reality can never be exhaustive? The number and types of causes which have influenced any given event are

always infinite and there is nothing in the things themselves to set some of them apart as alone meriting attention.' (Weber, 1948, p.78).

This is a difficult argument. Responding to it returns to fundamental issues.

This research is an opportunity to access stakeholders, both governance bodies and water users, at the catchment level and present a set of findings that will contribute to our understanding of the problematic addressed by the thesis. In general terms then, the principle of 'order' that underlies the value choices behind the research is predicated that the 'part' of reality that is being studied is 'interesting and significant to us'. This 'us' is perhaps a form of shorthand for the institutional organisation of research. For instance, research into relationships between water users and water governance bodies are 'significant and important for us' because it provides a fresh insight and contributes to future policy formulation and deployment.

In short, enquiry into the social world must operate within the boundaries determined by the philosophy of social enquiry. Knowledge of the social world is different in kind from that of the natural world. However, this does not prevent the research from operating within a highly structured scientific approach. This allows the production of social enquiry which is relevant, robust and adherent to 'scientific' premises.³⁴

³⁴ Are there limits to the investigation of social phenomena and who or what shapes these boundaries? Thomas Kuhn's work (1962) has been instructive and has contributed to a reflection on the value systems utilised by the social sciences. Kuhn developed the concept of the 'paradigm' or 'world view' to describe the way in which social science has an innate tendency to create self limiting boundaries by elevating

3.4 Social enquiry and the hydropolitics of water

Returning to, and elaborating on, the concept of the politics of water introduced in Chapter one, requires a refocusing on the underlying assumptions of the present work. This thesis associates itself with the work of Allan (1998, 1999) and Turton (1999a, 1999b) that roots water in its social and political context. Their enquiries could be described as hydropolitical as their work is concerned with questions of the social context of science and technology. They draw on insights offered by the disciplines of political economy and political science.³⁵ As detailed in Chapter 2, what is developed is the idea of a 'sanctioned discourse' around water which is highly politicised. Turton and Allan's work also direct attention towards the concept of legitimacy as embedded within the interaction of a number of different actors and institutions. The thesis therefore needs to elaborate a way of thinking about

some forms of disciplinary enquiry (namely theory development) whilst denigrating others (namely methodology). These constructed 'world views' can limit social science's willingness to risk new approaches. Kuhn's work allows researchers to be aware of disciplinary frameworks and to determine the social enquiry approach which is more relevant and suitable for their research hypotheses. With Kuhn's work in mind, the discovery of 'laws' or rules of social intercourse is, then, not an 'end' but a 'means' of creating interpretative schemas (Kuhn, 1962, p.79). This is not to denigrate or reject a search for laws or determinant factors in the social world. They are essential 'heuristic' or interpretative devices, allowing the world to be understood. However, behind the configurations that allow these interpretative devices to be presented in the first place are 'value orientations' and 'value concepts' (Kuhn, 1962, p.76) that allows empirical reality to be incorporated into culture. Ultimately: 'the knowledge of social laws is not knowledge of social reality but is rather one of the various aids used by our minds for attaining this end' (Kuhn, 1962, p.80).

³⁵ Although much of Allan and Turton's work is focused on developing and middle income countries, they reveal how water stress creates tensions in developed political economies due to the interdependent nature of international politics and economics.

how actors and institutions relate to each other. It is pertinent then to explore Turton and Allan's methodologies further and determine if their approach is useful to this thesis.

Turton and Allan are concerned with assessing which different policies are put in place, what is included and excluded from the policy and political agendas, national and international ways of organising water resources. Allan's methodology utilises both scientific data and adopts a traditional political science approach of assessing the impact of policy decisions on both individual river basins and multiple international watersheds. As Allan is dealing with a natural resource, he employs scientific data to illuminate the inadequacy or saliency of policy decisions in water resource management, particularly those at a supra-national or transboundary level (Allan, 1999). Turton meanwhile seeks to analyse the power politics involved in water resource management through a combination of scrutiny of official policy documents, statutes and committee findings along with case study analysis (Turton, 1999a, 1999b). Yet this social enquiry remains to some extent at the level of reviewing tariff structures, social responses to changing prices and education campaigns to elucidate policy decisions. His work does not directly involve social enquiry through direct qualitative work with actors and institutions. One of the potential contributions to knowledge derived from this thesis then is the generation of unique qualitative data which understands in greater specific detail the relationship between water users and water

governance bodies at catchment level to add to the field of hydropolitical analysis. It is now necessary to see how these themes inform the empirical field work undertaken.

3.5 The development of the empirical fieldwork

Given water stress' emergent status, understanding the nature of the extant relationships between water users and those institutions tasked with governing or taking stewardship over water resources is crucial. This is the macro objective; the question remains about the scope and nature of the research activities that are suitable to this ultimate concern. As suggested in previous chapters, there are potentially a very broad set of issues raised by the national and international aspects of water stress. However, looking at all developed countries or a series of case studies to provide comparative analysis would not be possible within the scope of this present work.

Having selected one catchment as the boundary of analysis it is vital to ask some pragmatic questions. What data can be gathered within the research time frame and given the available resources? What are the financial, time and manpower constraints to the research? Will the quality of the data gathered be diluted by trying to be too inclusive? Will there be enough time and resources to fully analyse and make best use of the data? What will satisfy the research questions and provide the thesis with the information to begin to address the research objective? Are there enough resources to

disseminate and test those ideas by way of publications, presentations and conference papers?

With these questions in mind it is also pertinent to gauge the appropriate remit of the research. As the current scale of water governance is at the catchment level the focus on river catchments as the boundary for social enquiry also seems appropriate.

Having developed a theoretical or 'deep' methodology to underpin the research in the first section of this chapter, we now turn to detailing how the research will take place. Five separate pieces of research activity were undertaken as outlined in the following subsections. Figure 4 details their development.

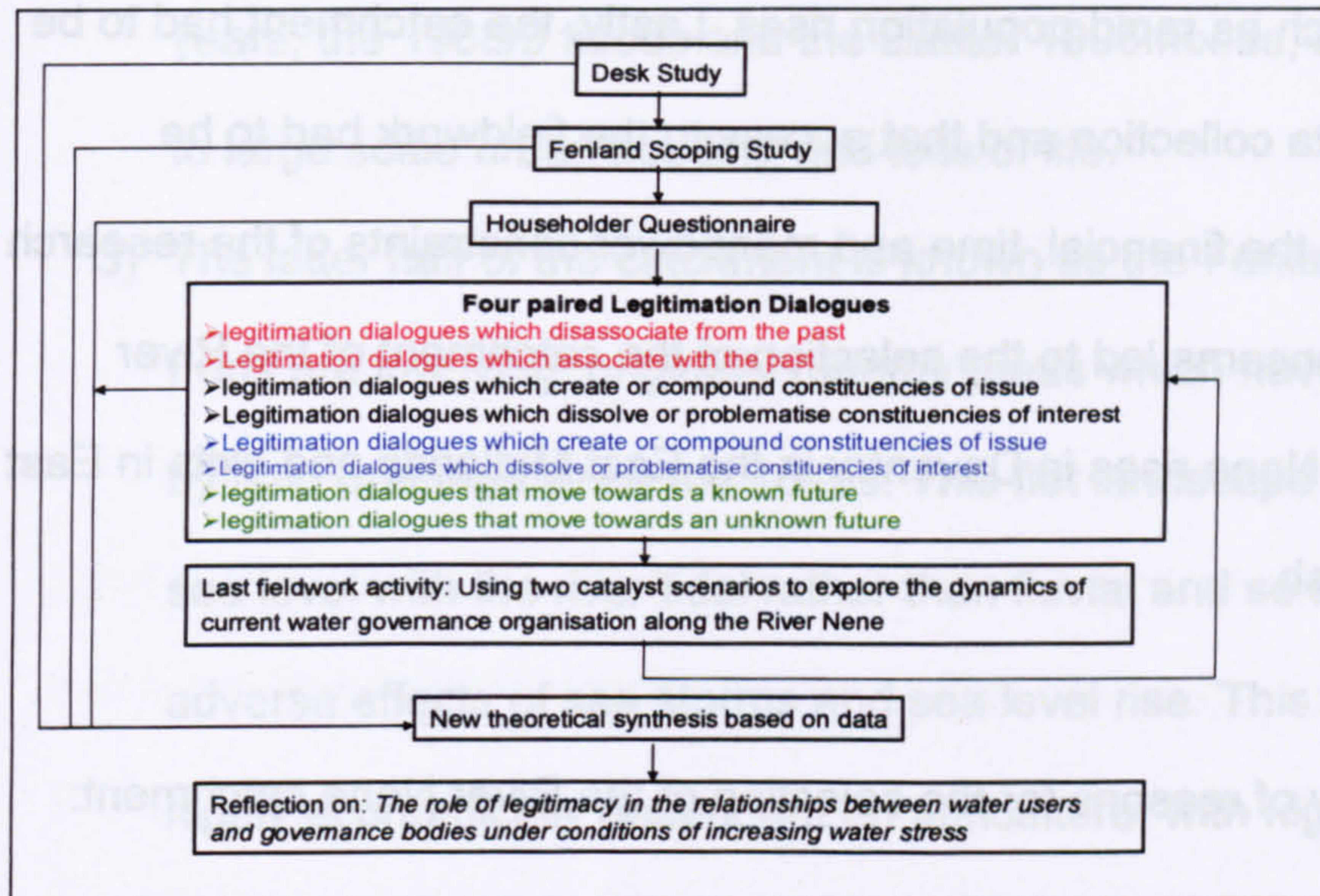


Figure 4: Research activities progression diagram

1) Research activity 1: Background study and catchment selection

The initial goal was to isolate the boundaries of the research. This was the task of the desk study activity, which is elaborated in more detail in Chapter Four. With a single catchment isolated as the spatial scale under investigation the question of location was important. The catchment needed to be free from any overt political problems or issues which may bias the results of the empirical fieldwork i.e. there should be no high media profile or problems of public health outbreaks which may sway unbiased data collection. Secondly, temporal issues which may impact on the data collection process had to be addressed. Particular concerns related to the necessity for each data collection phase to provide comparable data. For instance, if the catchment is affected by a tourist or seasonal population this should be compensated for in the research. Thirdly, the catchment should ideally exhibit some water stress tendencies, this could be drought or flooding events, or be subject to water

stress drivers, such as rapid population rises. Lastly, the catchment had to be accessible for data collection and that access to the fieldwork had to be achievable within the financial, time and manpower constraints of the research project. These concerns led to the selection of the catchment of the River Nene. The River Nene rises in Daventry in the East Midlands and exits in East Anglia at the Wash.

There is a variety of reasons for the selection of the River Nene catchment:

- 1) The catchment lies within two rainfall regimes, the Midlands regime with annual renewable water resources of 726 cubic metres per person (EA, 2001), and the Anglian region with annual renewable water resources of 691 cubic metres per person (EA, 2001). Looking back to the UN's water stress definition outlined in Chapter one, the catchment currently displays water stress characteristics.
- 2) The catchment lies within a government designated growth zone with three urban areas, Northampton, Wellingborough and Peterborough, adjacent to the river looking to rapidly expand their population within the next 15 to 20 years (www.ODPM.gov.uk). This development will almost certainly stretch available water resources. This upper stretch of the catchment is also part of the Northamptonshire wolds which contributes to flash flooding along the river at times of extreme rainfall events. Two serious flooding events have occurred within the last fifty

years, the 1968/9 floods and the Easter 1998 floods, both of which lead to large scale urban flooding and loss of life.

- 3) The latter half of the catchment is known as the Fenland area. The Fens are low lying, originally marshy areas which have been managed by land drainage since the 1640s. This flat landscape is often below sea level with the river tidal rather than fluvial and so subject to the adverse effects of sea storms and sea level rise. This area is also highly economically dependent on agriculture, with high levels of abstraction directly from the River Nene peaking in the summer months, often pivoted around the vital six week potato cropping season (June/July). The characteristics of the River Nene are outlined in more depth in Chapter 4.

Research activity 2/ Fieldwork activity 1: Fenland scoping review

Having selected the catchment and undertaken a desk study the research had to isolate what issues connected with the River Nene, and its adjacent corridor, were of concern to the two stakeholder groups of the research; the water governance bodies and the water users. It was decided that the most efficient method of establishing a typology of concerns was to undertake a scoping review of a section of the catchment. This would allow the research to begin to isolate what types of legitimacy concern was present. Rather than starting with an agenda the research would adopt a 'blank canvas' approach and uncover what issues generated interest. This scoping review, which is

detailed in Chapter 5, aimed to talk widely to water users and governance bodies about the sorts of issues that were of concern to them as individuals working and living within the River Nene corridor. This type of activity has been utilised by researchers as a means to develop a model of issues for further testing. The benefit of having no fixed agenda is that it lessens the likelihood of predetermining question boundaries and so reduces researcher bias and allows for spatially specific views to emerge, which might otherwise be disguised within a formal fieldwork approach. Returning to the theoretical methodology, this semi structured approach enabled an uncovering of local knowledge and expertise, coherent with Bourdieu's (1977) desire for the researcher to root oneself into the field of research i.e. to develop a more subject-subject orientated approach (rather than subject-observer), particular to that segment of the catchment. Using an interpretative framework the research went on to reflect on how far the results from the scoping activity confirmed any assumptions stated in the thesis about the two actor groups.

As outlined in Chapter 5 a number of concerns were revealed:

- (1) The role of water management seemed almost invisible to water users; indicating that water governance bodies were undertaking a credible and successful role. In legitimacy terms, and referring back to Chapter 2, there was strong input and output legitimacy.
- (2) The catchment itself was not viewed in the entirety of the river; instead only a localised view of the river was projected. This is epitomised by the use of two pronunciations for the river's name, delineated by being

either upstream of the village of Thrapston (Northamptonshire), where the river is pronounced 'Nen' (rhyming with 'hen') and downstream of Thrapston where the river is pronounced 'Nene' (rhyming with 'wean').

- (3) There was no pronounced 'us' and 'them' aspect to water management in this section of the catchment. Water governance bodies incorporated official governance bodies and informal water managing collectives; this contributes to a high degree of social legitimacy in the catchment segment.

The consideration of these findings in the light of the thesis aim, led to the development of the next research activity, the household questionnaire.

Research activity 3/ Fieldwork activity 2: A catchment wide domestic water user questionnaire.

As outlined in Chapter 5, this third research activity draws on the results from activities one and two. Having recognised that water users largely accepted the activities of governance bodies within the Fens section of the catchment, the research was faced with a series of new questions with which to explore the research problem:

- a) Is legitimacy signified by the absence of tensions or worries between governance bodies and water users; or do we need to confirm the presence of legitimacy by specifically identifying it?

- b) Is it acceptable to assume that water users are satisfied with water management actions and policies if they are not voluntarily critical of the current regime?**
- c) What types of concern do water users have about their local water environment?**
- d) To what extent, and with which policies, would water users be prepared to adapt to water stress?**

To address these questions generated by the Fenland scoping study, the next fieldwork activity needed to undertake a piece of research which would capture water user opinions along the catchment. As detailed in Chapter 5, the most efficient method was to undertake a household based domestic water user survey, asking water users a variety of questions to address these issues. Developing and deploying a questionnaire is time and manpower intensive; as is the data analysis of the results. The results presented in Chapter 5 are thus a synthesis of the most pertinent questions from the questionnaire.³⁶ The selective presentation of these results returns again to a methodological concern. However; selectivity is an aspect of interpretation and as long as the reasons for the selection are made clear, this does not invalidate the value of the results presented.

The results provided by the household survey revealed a range of responses concerning water users' views towards water governance bodies and the

³⁶ The full questionnaire is presented in Appendix 1 and frequency graphs showing the results for each question of the survey are available for examination.

water environment. This provides data which allows an analysis of both water users' receptivity to emergent policy and demonstrates what types of possible change they are willing to accommodate. In particular, the scope for increasing a policy or processes' legitimacy credentials seemed to be pivoted around the context in which the policy or process is presented. In other words legitimacy is contextual and embedded with a mesh of interconnected values and opinions. This lead to a revaluation of how to identify the operation of legitimacy through empirical work and how it might be possible to present this enmeshed quality of legitimacy as a conceptual model.

Research activity 4: The development of the legitimacy dialogues model

This data generated by the household questionnaire provided an opportunity to study how people articulate their concerns and disseminate opinions. How can this be related to a concern with legitimacy? The 'legitimacy dialogues' model is explored in Chapter 6. The legitimacy dialogues model is useful as a starting point to try to understand the complexity of social interaction. The empirical data also allowed an engagement with the theoretical concerns developed in Chapter 2. Would it be possible to 'find' examples of input and output legitimacy? Could understanding and accessing these oblique legitimacy dialogues provide a means to develop policy instruments which accord with citizen's own perspectives on issues – even outside of water management issues?

Research activity 5/ Fieldwork activity 3: Structured interviews with water user associations and governance bodies associated with the River Nene catchment

Absent from the research activities considered thus far is an understanding of the ways in which water users and governance bodies view water stress scenarios and the types of change they envisage being necessary as a means to either reduce water stress or enable adaptation. Chapter 7 addresses these themes. The method adopted was to select an equal number of both governance bodies and representatives of water user groups from along the catchment to answer pre-prepared, pre-seen questions and record their responses. These responses would be analysed both in terms of their content i.e. their response to the question, and would also be analysed to determine if it is possible to discern the presence of legitimacy dialogues. If legitimacy dialogues could be found then the analysis would also undertake to examine the types of dialogues used to explore when and how these dialogues are deployed. The results are discussed in Chapter 8 and the thesis' conclusions are developed in Chapter 9.

3.6 Conclusion

The methodology of this chapter is founded on principles of social scientific inquiry. It has been argued that whereas social science research can be rigorously organised, the assumptions that motivated a piece of research are

always bound to be value judgments. Aside from making clear the nature of the assumptions and value judgments that motivate the work, it is not possible to 'cleanse' enquiry from these judgments.

Understanding the social world means learning about the actors within it. This relates back to the point above about the nature of value judgments. It has been argued that this research is predicated on a notion of water stress. This may or may not be an issue to the actors whose views of the social world are elicited in this thesis. However, the relevance and usefulness of the notion of water stress and the issues of adaptivity and legitimacy that it places on the agenda can only be assessed as to the extent in which they provide a useful heuristic framework. Thus, any ultimate assessment will have to await the formal conclusions of this thesis.

The research has also been concerned with the internal organisation of the thesis. This thesis is grounded on a reflexive process. Understanding is a process that begins with the assumptions made about the phenomena to be interpreted. These assumptions, are then modified during the course of interpretation. This thesis therefore assumes that the problematic outlined in Chapter 1, along with the knowledge gap identified within the literature review in Chapter 2, are a 'fore project' or 'prejudice' that conditions the interpretations of the social world that the thesis will make. The five research questions outlined in Chapter 2 are the means to modify this 'prejudice' or set of assumptions.

These assumptions are then subjected to an iterative process. To anticipate the more detailed elaboration of this process, Chapter 4 describes the undertaking of a desk study to isolate the remit of the enquiry. It deals with questions such as the location and scale of enquiry and which actors need to be addressed. As will be demonstrated in Chapters 4 to 7, each data gathering exercise builds on the one before and reflects on how far the aims of the thesis are being satisfied. Each new activity is assessed in light of this reflection and evaluation. This can be understood as a self-correcting process. This chapter has also isolated the empirical methodologies adopted by this thesis. The research methodologies for each of the specific research activities do not adopt the same approach, but instead are sensitive to the data needs for each activity.

The next chapter develops in more detail the first research activity, the desk study.

Chapter Four: The current water management regime of England and Wales, and the River Nene catchment

4.1 Introduction

This chapter's objective is twofold. Firstly, it will provide an overview of the historical changes in water management governance within England and Wales to help build a detailed picture of the influences on the development River Nene catchment. The chapter will then go on to show how relationships between water governance bodies and water users at the local level are influenced by national policy. This understanding of the historical background and the basic structures of the contemporary water management regime provide an introduction to themes that will be studied at an empirical level in Chapters 5, 6 and 8.

Section 4.2 provides a macro review of the English and Welsh water sector.³⁷ This review shows how the privatisation of the sector in 1989 has to be seen within the context of changes over the last hundred years. Privatisation in fact makes for a return to a market ownership model that was prevalent in the 1800s. Whilst it is instructive to draw some parallels between the present time and the Victorian era, it is also important to acknowledge the precise form of the present structures of the current water management model. The new

³⁷ Scotland and Northern Ireland have their own water management regimes which differ significantly from England and Wales and so remain outside of the thesis' remit.

regime has a regulatory framework and is tightly controlled at the national level,³⁸ with European legal and political influence steadily growing.

If we look at the spectrum of management models which could be used to organise a developed country's water management regime we see that the English and Welsh example is one extreme. No other European country has gone so far with the liberal model of privatisation within the water sector. The reason for the adoption of this model has been well documented within the literature (Kinnersley, 1994; Richardson *et. al.*, 1992). Less clear is the impact privatisation has had on water users, and in particular how commodifying water has altered expectations of water resource management.

Returning to the legitimacy theme, Section 4.2 will also argue that privatisation in water provision has created a set of tensions that have to be negotiated. New relationships have been created between water user and water provider (Strang, 2001). The privatisation or commodification of water has arguably created the potential for a legitimacy gap (Habermas, 1976) that must be both understood and ameliorated if the sector is to cope with the need for the types of social, political and economic adaptation and transformation brought on by water stress.

³⁸ Three regulators were established by the 1989 Water Act: the Office of Water Services (Ofwat) to control price rises, ensure available capital for investments and hold the reins on the 25 year water licenses; the Drinking Water Inspectorate (DWI) who are concerned with ensuring drinking water is 'wholesome' (www.dwi.co.uk) and fit for the purpose and finally the National Rivers Authority (NRA) whose rationale was to safeguard various riverine functions such as water quality, environmental quality, navigation and flood defence.

A second problematic area will be outlined. As national institutions seek to streamline through regionalisation, European policy making seeks to organise at the river basin level, which is not necessarily congruent with national policy making structures. There is then a potential breach in continuity, both in policy making and policy implementation, as different institutions take responsibility for different catchment functions. This problem must also be tackled to allow coherent policy making.

Section 4.2 will also outline how this regulatory structure operates at the catchment level. Following sub-sections will detail the hydrological, topological and social demographic data of the catchment. The water use profile throughout the river corridor is also considered in Section 4.7. The chapter concludes with a profile of the governance bodies and water user types at catchment level to provide some guidance for the first research activity outlined in Chapter 5.

4.2 A brief history of the water sector: from private provision to privatisation

It is possible to chart a transformation of the English and Welsh water management paradigm through three different stages in a period that stretches from the 1800s to the 1990s. In the 1800s water provision was in the hands of independent private companies. From the 1840s onwards, though,

water provision and management was increasingly brought under the control of the state. The reforms of 1989 saw a privatisation of water provision and the creation of a strong regulatory structure. In this sense, the history of the water sector is an account of marked transformation.

This transformation can be seen as something of a circular return that begins with the dominance of independent, privately run enterprises, moves through a period of nationalisation, and then returns to privatisation. As national economic development increases, so water planning and provision moves into the arena of expert discourses, with local knowledge being side-lined. It must be stressed, however, that the current privatised model is vastly different from the ad hoc water supply framework of the 1800s. Today's system incorporates water supply and waste water treatment within a tightly regulated domestic and international regime. Then, as now, water provision remains a lucrative business.³⁹

As with so many other European countries,⁴⁰ the path to a national water supply system originated in a concern with safeguarding public health. The impetus to engineer, both in terms of hardware and policy, a more cohesive strategy to improve water quality and develop some limited kind of sanitation network was prompted by continual public health outbreaks in the rapidly growing cities created by the industrial revolution. By the late 1800's the role

³⁹ To illustrate, AWS' profits for 2003 are listed at £287.4 million (www.thewaterplace.co.uk).

⁴⁰ The Netherlands, Germany and France have followed a similar trajectory to England and Wales.

of the 'expert' in water management became pronounced. One of the important effects of this conjunction of discourses was the creation of water management as an area of national concern. This led to a series of review panels, health committees and Acts of Parliament. The outcome of a series of largely successful reforms was a water management regime focused on a complex institutional system of boards and authorities, clustered around the booming industrial cities. There was no coherent overall management of the various institutions involved with the provision and management of water.

This situation was streamlined by the Water Act of 1945 that amalgamated all existing water legislation and enacted a waterworks code. Over the next twenty years the number of actors in the water sector was significantly reduced with private water suppliers falling to around 25% of national provision (Kinnersley, 1994). The focus of responsibility still lay mostly at the local level. This stress on local knowledge and responsibility has been much neglected in contemporary water scholarship. However, a memory of this form of water management does remain.⁴¹ The fieldwork undertaken for this project suggests that for those interviewees who have worked or lived in an area for a

⁴¹ The cultural archives of our interaction with water have been well documented – from Janet and Colin Bord's 1985 history of British water cults, holy wells and water myths (Bord and Bord, 1985), to Simon Schama's 1995 analogy of river exploration as colonial metaphor and Veronica Strang's 2001 work in cataloguing water within our cultural psyche. All these works attest to water's unique position as one of our most celebrated natural resources. They also reveal that an abundance of water is what makes us 'British'. That we are from a water rich country would be hard to contest. Rich agricultural land, green forests and plentiful lakes and rivers are there for us to see. If anything, the most recent difficulty would be controlling our flooding problem. Water stress appears remote in comparison. Images of water scarce lands dominate other parts of the world, and only in times of drought do we recognise the need to conserve water.

long period of time, the local knowledge of water engineers was always a crucial element in river management. From today's perspective, the cost factors of such intensive stewardship would be deemed too high.

By 1970 the water supply and sanitation sector seemed settled (Ernst, 1994). The responsibility for water provision was in the hands of the thirty or so municipal water boards that were accountable to the local authorities and who, in turn, provided capital funding. Financing was based on the rateable value of private property, with no emphasis on full cost recovery, as infrastructure investment was supplemented by central funding. Further streamlining followed as a result of the 1974 Water Act. This Act created ten regional water authorities, with jurisdiction organised around river basins. In effect, this enabled planning to be conducted at a regional scale. Rather than a range of often conflicting viewpoints from the various management boards of the water authorities, the new structure reduced the number of members of each water authority, decreased the influence of local councils and concentrated on the development of staff expertise and co-ordination across functions (Ernst, 1994).

The years after the 1974 Act saw further reforms that addressed the relative economic efficiency of nationalised industries and were ultimately to result in the privatisation of the water sector in 1989. However, before examining these reforms in a little more detail, it is important to stress the importance of the increasing authority of the European Community (EC). The first of the EC

directives on water (see Table 3) was concerned with the quality of coastal waters, focusing on the practise of effluent dispersal at sea. As further EC directives were deployed (including point source pollution, bacterial quality and sewage landfill requirements), it became clear that the role of monitoring and regulating both government and EC directives through the same body was not conducive to a well managed resource. This was recognised as the 'gamekeeper-poacher' syndrome.⁴² It could thus be suggested that the need for more effective regulation and cost effectiveness were drivers of the privatisation process (Summerton, 1998; Richardson *et. al.*, 1992). By 1989, the water sector had been entirely privatised. As stated in the water sector's 1986 white paper: 'Profit is a more effective incentive than Government controls'. (Ernst, 1994).

The water sector was transformed by privatisation. The entire water supply infrastructure, previously built and maintained with public funds, was now wholly owned by the shareholders of the ten water companies. The value of the sector at the time of privatisation was £364 million (Bakker, 2001).

The 'gamekeeper-poacher' problem was resolved through a distinct separation of regulatory powers. Economic regulation fell under the remit of the Office of Water Services (Ofwat). Ofwat were charged with reviewing pricing levels every five years and controlled the twenty five year lease which

⁴² The water boards had, in effect, to police themselves to prevent pollution incidents. This led to a less than rigid adherence to EC guidelines. For more detail see Kinnersley, 1994.

gave the water companies their license to operate. Environmental regulation became the responsibility of the National Rivers Authority (NRA). This organisation also took responsibility for the environmental quality of the water environment. The NRA was superseded in 1996 by the Environment Agency which absorbed the function of the HMIP (Her Majesty's Inspectorate of Pollution) and other agencies to become the regulator that co-ordinated air, land, river and wildlife policies. In 1996 the EA took responsibility for environmental water health, navigation and abstraction licensing. The final area of regulation fell under the Drinking Water Inspectorate (DWI) who oversaw drinking water quality only. English and Welsh water supply and sewerage services were now fully privatised and controlled by a highly regulated system that enjoyed a separation of functions and powers (see Table 3).

Great regard was given by the Conservative government to making sure changes were regarded as legitimate. Richardson *et, al.*, (1992) detail the courtship of the water boards and local government by the national government in order to slowly convince them that not only was wholesale change necessary, but also achievable. The success of the privatisation process also relied on developing an industry that appeared dynamic; water companies were presented as commercial 'players' in order to attract foreign direct investment. The most challenging aspect of privatisation, though, was the goal of persuading water users to accept water privatisation and to spur them to become shareholders. This was particularly difficult as the opinion

polls of the time reveal that between 70% and 80% of the population were against the privatisation process per se (Ernst, 1994). Privatisation was perceived as the selling off of a national heritage.

That full scale water privatisation was achieved at all shows that those in charge of marketing strategies did appreciate the importance of presenting change as a legitimate need. However, as we will see, concerns remain as to whether the total asset privatisation model was the most suitable one to use. Given the initial hostility of popular opinion⁴³ to the privatisation process it is useful to isolate three strategies that might explain why the new water management structure was generally accepted.

Firstly, the speed of change left little chance for critical debate or consultation. In less than 18 months, from the Water Act receiving royal ascent in July 1988, to the sale of the Water Holding Companies in December 1989, the sector was transformed in terms of regulatory structure, financing and ownership. Secondly, the mode of change was also significant. It embraced the economic mood of the decade. Privatisation was pitched as a means for everyone to become part of a share-owning democracy. The third factor that led to the perception of privatisation as a success was the relative stability of water prices and the continuity of the water holding companies post privatisation (the changes seemed to be in name only). This lessened the

⁴³ Opposition included bad press from the national media (Haughton, 1998), a rebellion in parliament (Richardson *et. al.*, 1992) and negative results from public opinion polls (MORI, 2002).

upheaval. In summary, it could be suggested that the limited consultation process coupled with exceptionally strong state endorsement were key factors in the apparently successful re-configuration of the water industry.

However, the ability of the water sector to transform and continue to thrive does not necessarily mean that legitimacy has caught up. Perhaps the most convincing explanation for the apparent ease of transformation of the water sector was the monopolistic nature of the industry— customers could not simply switch providers or refuse to consume. There are other indications that privatisation was not entirely accepted. From a disregard of water use limitations (Haughton, 1998), to non-payment of bills by middle class consumers (personal communication) and a general disgruntlement with private ownership of the sector (MORI, 2002) it could be argued that there was no alignment between the sector and the hearts and minds of the public. Indeed, Bakker describes the disjunctures brought about by privatisation as the 'primary source of the legitimacy crisis of the privatised water industry' (Bakker, 2001, p.157). The example of the English and Welsh water industry privatisation (see Table 3) suggests that what was meant to be a reform directed towards efficiency of management remains a politically contentious act.

1848	Public Health Act Creation of 34 River boards under MAFF
1876	Rivers Pollution Prevention Act
1936/7	Public Health Acts
1945	Water Act – consolidated legislation
1951	Updated River Pollution Prevention Act
1959	UK drought
1960	Extension of River Pollution Prevention Act
1961	Further extension of River Pollution Prevention Act
1963	Water Resources Act – limits to abstraction and spray irrigation
1965	Change from river boards to river authorities
1965	Creation of water resources board – to strategically plan for new water resources
1967	Water (Scotland) Act
1972	Reorganisation of local government
1973	Water Act – created 10 water authorities, absorption of river boards
1974	Control of Pollution Act
1983	Water Act – local authorities lose influence; all meetings private; consumer consultation committees established
1986	Department of Environment consultation paper (February). Open discussions regarding privatisation
1987	Department of Environment consultation (July). Discussions involve the creation of the National Rivers Authority

1989	Water Act –full privatisation of sector. £56 billion debt written off, cash injection of £1.6 billion ‘green dowry’
1990	Environmental Protection Act Town and Country Planning Act (1991 saw the introduction of five Acts which consolidated previously disparate Acts to clarify responsibilities amongst actors and institutions regarding the management duties of resource management and service)
1991	Water Industry Act – consolidated 1989 Act and aggregated all sewerage legislation
1991	Water Resources Act
1991	Land Drainage Act
1991	Statutory Water Companies Act
1991	The Water Consolidation Act Establishment of Drinking Water Inspectorate
1992	Competition and Service Utilities Act – Ofwat to stimulate competition within the sector
1994	Conservation Regulations (Habitats Directive)
1995	Environment Act – to promote efficient use of water by all consumers
1996	Environment Agency created, replaced, in part, National Rivers Authority
1998	Groundwater Regulations
1998	Competition Act
1999	Anti Pollution Works Regulations

	Pollution Prevention and Control Act
	Water Industry Act – disconnection of domestic customers prevented; compulsory metering banned
2000	Contaminated Land Regulations Act
	Utilities Act – no effect on water or telecoms industries
2001	Water Framework Directive – management at river basin level; good water quality; public consultation
2003	Water Act

Table 3: The historical development of the English and Welsh water regime 1848 - 2003

Other developed countries have been through a similar period of institutional reformation. In comparison with the UK, however, changes have been incremental. In France, for example, water supply and sewerage services have evolved since the 2nd World War into a privatised service through municipalities issuing long term licences, generally set at around a hundred years (Barraque *et. al.*, 1998). This provides for stability in asset management and capital expenditure whilst leaving the ownership of the assets and ultimate control with the municipalities (Barraque *et. al.*, 1998, p.93). In the Netherlands public water companies provide water supply services on a cost recovery basis only (Barraque *et. al.*, 1998). The Australian water regime also follows models of accountability and responsibility through regulated markets (Sarac *et. al.*, 2002). In all these countries, assets, including the infrastructure, engineering and technical expertise, are retained by central government.

4.3 Water stress in the new paradigm

Perhaps there is a tension between the regulatory structure and the fact that water is now a product to be consumed rather than simply a communally shared resource. It may be possible to argue that legitimacy resides less with the IWRM experts who previously managed the resource than with the consumers who dictate how much water they require and when they require it. There are tensions between concepts central to consumerism, namely efficiency, service and value, and the realities of managing a natural resource.

A flooding event can also test community coherence. Looking specifically at the River Nene catchment, the 1968/9 floods were attributed to extreme weather conditions that were in excess of the 1:50 year event previously calculated for using existing flood records of the catchment. In response to this event the British Waterways Board invested around £300,000 in flood defences, a significant sum at the time.⁴⁴ Local media reports focused on the salvage operation and the swift restoration of the local community to normal life. A flooding event in the catchment in Easter 1998 which was of a similar scale was reported very differently. Around 10,000 homes were flooded and two people died as a direct result of the flood. A post-hoc flood analysis undertaken by Byes and Horner (2002) placed blame on the water governance institutions, in particular the EA, along with the police and the local council. Criticism was levelled at the flood warning system, the local

⁴⁴ Personal communication.

flood defences and the lack of contingency plans amongst the emergency services. Many residents interviewed in the report spoke of their disbelief that the floods had not been anticipated, despite a week of heavy rain. There appeared to be no flood warning procedure in place amongst local institutions and the EA was found wanting in a number of key areas by the report.⁴⁵ In particular, local feeling seemed to pivot around not so much the natural event itself but that the flood defence and emergency response systems had failed.

Media reports and personal recollections from both the Northampton flood events suggests a shift from community response and community reparation to organisational response and individual compensation. In extreme events communities pull together, but in the aftermath of recent flood events individuals are left to liaise with the appropriate institutions and organisations themselves.⁴⁶ It is also possible to suggest that expectations of service have changed throughout the water management regime, not just in the privatised water supply and sewerage sector but also in the wider environmental and resource management area pivoted around changed expectations of risk (Giddens, 1990). The question tackled in the next section is whether increasing water stress will exacerbate these altered relationships and the fracture points inherent within them, or if a new model of relationships between consumer and governance bodies will be forged.

⁴⁵ Commissioned by DEFRA.

⁴⁶ This could partly be attributed to the changing nature of risk in modern society epitomised in this flooding example by the discrepancy of households who were insured and those who were not. For a useful introduction to the notion of risk, see (Giddens, 1990).

The current English and Welsh water management history indicates that as a regime it should have the potential to generate adaptive policies and management tools. This supposition is based on the sector's evolution over many decades, a process that lends authority and expertise. The privatisation of the water sector theoretically provides for a market orientated sector which seeks no funding from central government and is run along full cost recovery lines. The strong regulatory regime, which operates most effectively at national and regional levels, acts as a check against the water companies' natural monopoly position within the market. These factors provide for a robust system that promotes efficiency, quality and equity through a demand management ethos. Yet the system is flawed. Uneven competencies between the regulators leads to regulatory patchiness; questions over examples of regulatory capture are not within the scope of this chapter, but are certainly a problem within the water management sector. There are also problems within the relationships between central government and water company lobby groups. These relationships may hinder the work of local and regional institutions.

It may prove that as the current regime is relatively young (only 15 years old), there is still much institutional evolution to take place. However, this scope of analysis is outside of the resources of this thesis, as little available research has been carried out on the current set of relationships within central water policy networks. Given the lack of close consultation and co-ordination

between infrastructure authorities, housing planners and water managers it is possible to suggest that whilst the water sector is attempting to carry out more joined-up governance and collaborative or consultative work, other sectors are not well integrated. Securing overall integration is ultimately the responsibility of central government.

Both the Water Framework Directive (WFD) and the 1998 Human Rights Act (HRA) have respectively prompted more public consultation and a clearer stance on the grey area over rights to water. The English and Welsh water management regime demonstrates a strong institutional structure, though one which is quite insular and unable to penetrate other policy networks. The lack of a written constitution also prevents a statement of citizen's rights to all aspects of water services being clearly articulated. In turn this may also underpin the predominant cultural belief that water resources are not stressed in the UK. Adaptivity may well be activated when politicians recognise the need for collaboration across policy networks. What may drive this recognition is not yet clear. The dual influences of the WFD and HRA may play a significant part in activating a paradigm shift in the English and Welsh water resource governance regime.

4.4 Characteristics of the River Nene basin

The River Nene is an entire river catchment. It is neither a tributary to another river nor has any confluence points with any other major river. It does however

have its own small tributaries, namely the River Ise, Harper's Brook and Willow Brook. The estuary of the river and its tidal component (after the Dog-in-a-Doublet sluice) exit within the Fen drainage basin which has 10% of its land cover beneath sea level. Historically the river was important for the navigation of trading vessels. Consequently the river has been subject to extreme anthropogenic change. The river (as can be viewed in Figure 6) has been straightened for most of its course between Peterborough and Wisbech, within the Fens area, to accommodate larger river vessels and so create a quicker route than the original winding course would allow. It is the straightened version of the river which is now recognised as the River Nene and the older, more winding course from the town of March in Cambridgeshire to the Wash is distinguished by the title the 'Old River Nene'.

The river Nene is 117 miles long. It passes from its origins in Northamptonshire, through Cambridgeshire to its outlet at the Wash in Lincolnshire. This area of the East of England is known as East Anglia or generically as the Anglian region. The river is characterised as wide and slow moving. From its source to Northampton the river has its steepest gradient falling 300ft in 17 miles. Consequently, this section of the river is the most prone to flash flooding after bouts of heavy rainfall. For the following 100 miles the river falls less than 200ft. The river flows in a North-Easterly direction towards Peterborough in Cambridgeshire where it becomes tidal, finally meandering into Lincolnshire and closely following the Norfolk border before it

enters the North Sea through the Nene Washes (see Figure 6) and finally the Wash.

The Nene valley has enjoyed various patterns of land use which have effected and shaped the river's hydrology. In the 16th and 17th century there was a programme of Fen drainage which increased the flow of the river. In the 18th century the increase of population and the Enclosure Acts⁴⁷ led more people to work in factories. Alongside this migration to growing industrial towns, other factors led to a decline in agriculture that was exacerbated still further in the 19th century as the area underwent rapid industrialisation. The river acted as a key focus for navigation of goods, services and people. This increase of river traffic led to a development of locks, flood barriers and river straightening. The proximity of the Grand Union canal and the linkage of the river at the Middle Levels in Cambridgeshire which connects the River Nene with the River Great Ouse cemented the economic importance of the River Nene. The increased traffic on the water prevented silting and ensured that the river's flow was smooth. This also helped to decrease the risk of flooding.

The water level between Northampton and the Dog-in-a-Doublet Sluice, Cambridgeshire is maintained artificially to enable navigation. Most of the rivers and streams in Northamptonshire have been engineered or managed to

⁴⁷ The Enclosure Acts of 1760 to 1830 aimed to enable economies of scale in British farming by consolidating land into large areas. Smaller areas were aggregated and common lands disbanded. Farmers were required to enclose their lands through the construction of fences and gates. These acts prevented small-scale farmers from obtaining a livelihood and displaced them and migrant agricultural workers from the countryside. The cities consequently witnessed a surge in migrant workers.

The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

some extent and this is particularly true of stretches of the Nene running through or downstream of urban areas. Water is abstracted from the Nene at Duston and Wansford for drinking and at various locations by farmers for crop irrigation.

The EA has undertaken a range of habitat enhancement initiatives on the River Nene and its tributaries. This work has included bank re-profiling, pool and riffle reinstatements, creation of fish refuges and washlands, meander reinstatements and tree planting schemes (www.environmentagency.gov.uk).

Geographical features of the River Nene basin

The River Nene catchment spans the East Midlands region and the East Anglian region to the North of London. The East Midlands was typified in the early 20th century by a heavy industrial economy with engineering as a speciality which is now almost entirely light and service industry. With good rail and road routes to the rest of England, Wales and Scotland it benefits from its central location. The first major urban centre, moving downstream, is Northampton, a small city in the east of the region.

The East Anglian region has a mainly agricultural economy and this has shaped the land, particularly with the mechanisation of the sector in the mid 20th century. Although linked by the canal network, the decline of waterways as a transport route has meant that though close to London this middle and lower section of the catchment is a little isolated from the rest of the country.

The catchment's main centres in this region are Peterborough, again a small city with a growing service sector that also benefits from the hi-tech spill over from Cambridge, creating the 'Silicon Fen' hinterland, and the smaller market towns of Whittlesey and Wisbech which typify this mainly rural region.

Agriculture still relies on local watercourses but the region is supplied with a network of other catchments, including the River Welland and the River Ouse, so the hydrological flow along the Nene is not an imperative for the area. As trade has moved away from the canals and onto the rail and road network, river traffic has slowed and the Nene's real contribution to its riparian communities is in the form of tourism. This takes two main forms. The first is in its aesthetic quality as a peaceful slow moving river. Peterborough and Wisbech both place great emphasis on the picturesque quality provided by the river demonstrated by the literature generated by their city councils for bringing new business and new residents to them. The river is always prominently featured. The second role of the Nene is its importance in a growing leisure industry. Boating is very popular and generates income for the villages and towns on the Nene's banks. The recent allocation by the Environment Agency in 2000 of £630,000 for the development of three new locks and three new water points to promote boating, demonstrates its importance to the local economy.

The work of the Environment Agency to improve the quality of the water, which is at risk due to over-abstraction and pollutants from agricultural

effluent, has also been demonstrated through the recent introduction of bream into the river as part of a breeding programme to encourage the development of fish stocks and increase support from the angling community. Steps taken to improve the Nene have also resulted in the reintroduction of the otter heralding a return to pre-industrial high river water quality. Consequently the growth of riparian activities – walking, fishing and bird-watching are made a priority by the Environment Agency. Other activities which are becoming popular include kayaking and canoeing with a recently developed white-water centre located at a series of sharp drops in the river just outside of Northampton.

The governance agencies responsible for the Nene have to balance a difficult set of priorities. Although not a river which dominates the region that it spans, the Nene is a vital resource for the local economy and ecology. The growing importance that the leisure industry brings to the local economy is key, particularly as it is both urban and rural. The river is dependent, however, on ecological integrity. The water must be of an acceptable standard for swimming and there must be a regular flow for boating and kayaking; neither too much nor too little. The future for the agricultural sector is not assured. If this sector does decline the disposable income it generates could effect the catchment, as the relative isolation of the catchment from the rest of the country means that incomes are earned and spent within a close local radius.

As for the industrial sector, the spin-off generated by high-technology IT companies and call centres moving out of high cost land around Cambridge and into smaller urban centres like Peterborough could be effected by the recent global economic downturn which again will have an impact on the local economy.

Climatic characteristics of the River Nene basin

The catchment is situated in one of the driest counties in England and Wales with an average of less than 600mm of precipitation per annum. This rain fall is distributed equally throughout the year, on average over 175 days. The mean daily temperature in the winter month of January is 7 degrees Celsius; the mean daily temperature in the summer month of July is 21 degrees Celsius.

Consequently the River Nene catchment is an area of England with some of the lowest mean rainfall of all the country. This is coupled with above average evaporation rates. It is the driest region of the UK, with average precipitation of 596mm compared with a national average of 1190mm

(www.anglianwater.co.uk). Although low rainfall is problematic, the Fen area is a drainage basin and so has, particularly in winter, a steady flow of water through its catchments. However, in the summer, low flow coupled with high agricultural demand can cause abstraction problems. As detailed above this area is part of the affluent South East of England, close to London and the site of a possible 800,000 new homes within the vicinity of the catchment in

the coming twenty five years (<http://news.bbc.co.uk/1/hi/england/2727399.stm>). Given the low rainfall, population growth and potential impact caused by climate change, these resources may soon be stretched to capacity and may lead to a permanent problem of water stress.

Although rainfall is low, given a smaller population and different land use there is not natural water scarcity in the River Nene catchment. As the river catchment is part of the Fens drainage basin, the Nene and other catchments provide plenty of water to the area in winter months. Thus, the issue may be one of lack of adequate water storage facilities. Excess winter water which is 'lost' to the tidal river cannot be recaptured for the vital low-flow summer months. Feasibly it is the population pressure on the local economy which creates water shortage problems. These water shortage problems are likely to be aggravated in the next twenty five years by climate change. In short, the area is not presently water stressed but is very likely to experience structural and naturally occurring episodes of water stress within the coming twenty five years.

The Environment Agency in their 2000 report 'Water resources for the future; a strategy for the Anglian region' use four possible future scenarios to model future water use in the region. There are four 'foresight' scenarios: alpha uses 'provincial enterprise' as its model, beta uses 'world markets' (both alpha & beta are based on outlooks which are consumerist) gamma uses 'global sustainability' and delta uses 'local stewardship' – these latter two are focused

on community. These future scenarios build into possible models, as pictured in Figure 5 (below) which project forward to 2010 and 2025. We can see that scenarios alpha and beta would cause chronic water supply problems within the River Nene catchment.

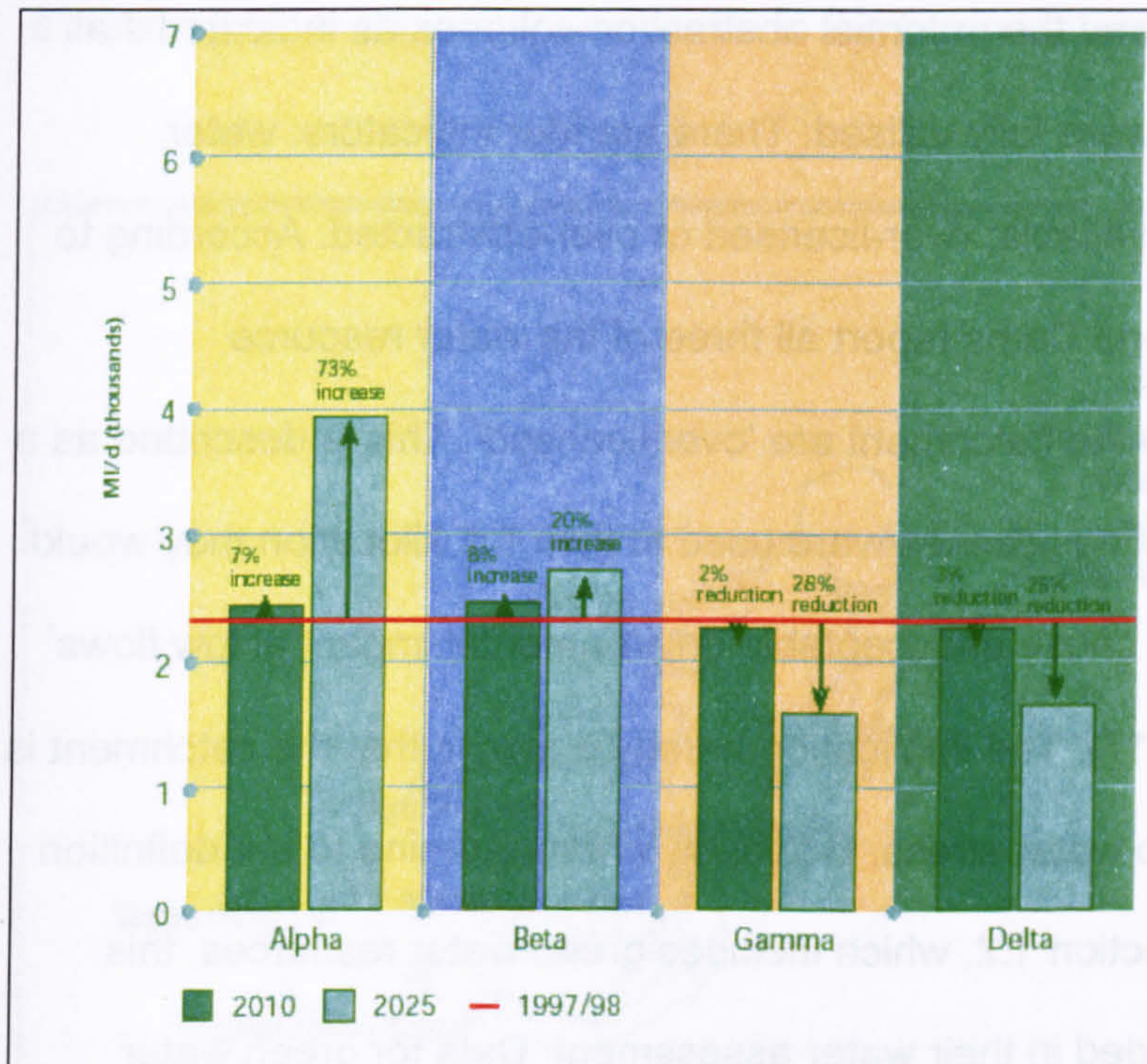


Figure 5: Projected Anglian region total water demand for 2010 and 2025⁴⁸

4.5 Current water use profile

In order to determine if the River Nene is vulnerable to water stress, or is currently water stressed, it is necessary to look at the status of committed abstractions from the river. The Environment Agency holds all publically available data for the river and undertake a resource assessment which

⁴⁸ (EA, 2001).

includes surface and groundwater, though not soil water. The catchment is assessed according to its 'indicative resource availability status' which indicates the relative balance between available and committed freshwater resources. The benchmark flow duration curves of the river, which indicate 'natural' flow without anthropogenic influence, are contrasted with the actual abstraction volumes and the potential abstraction volumes as indicated if all abstraction licences were fully utilised. There are four indicators; water available; no water available; over-licensed or over-abstracted. According to the October 2005 Nene Cams report all three of the water resource management units in the catchment are 'over licensed'. This is described as a state at which 'if existing licenses were used to their full allocation they would have the potential to cause unacceptable environmental impact at low flows' (Nene Cams, 2005, 17). The implication hereby drawn is that the catchment is already vulnerable to water stress. However, when returning to our definition of water stress in Section 1.2, which includes green water resources, this resource is not included in their water assessment. Data for green water resources in the River Nene catchment are not publically available. It should also be noted that the EA do not compile figures for the total water balance of annual renewable freshwater per sector for the River Nene.

Looking at water use along the river, the catchment has several urban centres (see Figure 6).

Water use Daventry to Northampton

As this region is located close to good road links, and benefits from regeneration funding from central government, which offers businesses lower ground rental, distribution and service industries dominate which are very low water users. This area has seen strong business growth over the past decade although there is a long term decline in agriculture. These factors have lead to an overall fall in the water use profile in the business sector.

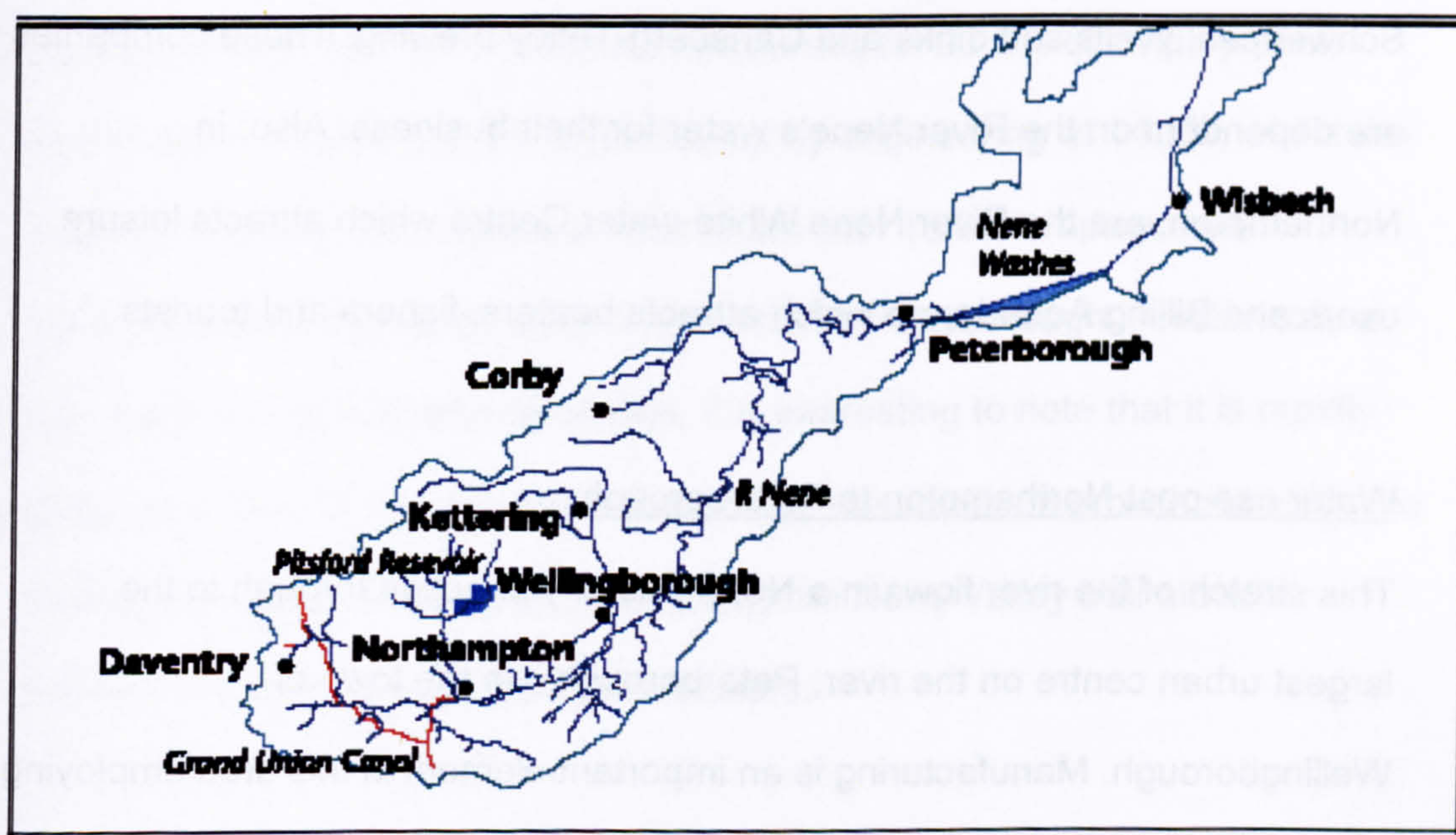


Figure 6: Site and distribution of main urban centres along the River Nene⁴⁹

The service industry is a growing sector with Banking, Finance and Insurance companies dominating. Distribution services are also key and a number of companies also have their headquarters located in and around Daventry and Northampton. Both these sectors have low water use.

⁴⁹ Source: EA website; www.environmentagency.gov.uk.

A 1998 Annual Employment survey published in 2000

(www.northamptonshire.gov.uk) listed as the five main employment sectors in decreasing order; manufacturing, wholesale and retail, real estate, health and social work and finally in joint position education and transport, storage and communication. Agriculture was ranked 12 out of 15. In terms of the second definition of water, it's utility, there are many businesses which use the River Nene. Northampton has three high profile water use companies: Coca Cola Schweppes, Wells soft drinks and Carlsberg-Tetley brewing. These companies are dependent on the River Nene's water for their business. Also, in Northampton, are the River Nene White-water Centre which attracts leisure users and Billing Aquadrome which attracts boaters, fishers and tourists.

Water use post Northampton to Peterborough

This stretch of the river flows in a North-easterly direction through to the largest urban centre on the river, Peterborough, via the town of Wellingborough. Manufacturing is an important element in this area employing approximately 30% of the local workforce. While the footwear industry in general has been in decline it has developed niche markets where companies are thriving, such as The Griggs Group, makers of Dr Marten's boots. The food sector is also strongly represented. Other manufacturing sectors such as precision engineering are also important. Due to its central location Wellingborough has developed as an important distribution centre for multi-national corporations involved in retail, manufacturing and parcel delivery. Nearly 24% of the workforce is employed in wholesale and retail distribution

and a further 11% employed within the transport, storage and communications sector (as at July 2003 www.northamptonshire.gov.uk). There is a growing service sector emerging as new and existing companies expand within areas such as printing, IT and Internet provision and business services.

The Peterborough economy reflects to a large extent that of Northampton and Wellingborough. The difference is that service industry dominates. The 1991 census showed that 'other services' accounted for 23.6% of employment, distribution and catering (23.2%) followed by engineering at 14.3%, whilst the banking, finance and insurance were fourth with 13.3% employment.

Agriculture is bottom employing only 1.3%. As Peterborough is historically a new town, i.e. specifically developed, it is interesting to note that it is rapidly expanding. The IT industry looks likely to be the dominant growth sector in the coming ten years. In terms of water utility, the Nene Valley trail attracts walkers, mountain bikers and bird watchers.

Water use profile: post Peterborough to the Wash

After leaving Peterborough there is no major urban area aside from Wisbech which is sited in the tidal part of the River Nene. The river becomes tidal after the Dog-in-a-Doublet sluice at Whittlesey; the lock prevents the salt water intruding any further upstream. Subsequently there is little use of the river water after this point apart from a navigational role.

The Fens economy is dominated by agriculture and food processing. There is great economic slowdown in this region with the highest rates of unemployment in all of Cambridgeshire. There is a regeneration project currently underway in the three market towns of the Fens (Wisbech, Whittlesey and Chatteris). As agriculture dominates, this user group is the second largest in the area, with domestic consumers as the primary user group.

There are plans underway to restore the Fens to its natural state of wetlands. As detailed, the Fens were artificially drained in the 1600s to accommodate for more housing and agricultural land. Most of this area is below sea level and is a drainage basin for other river catchments. Although rainfall is low all year round, because of the downstream nature of the basin there is excess winter flow. By restoring Fenland to wetlands the whole area will act as a giant sponge for winter water, releasing water back into the catchment in the summer. The aim is to capture otherwise lost water i.e. water flowing to the sea. The other benefit is to attract national and international grants, allowing an inflow of money into an economically rundown area. By restoring the 'Great Fen' there would also potentially be an influx of tourism activities through birdwatchers and walkers coming to the area, this also has a much greater multiplier affect on the local economy than agricultural activity.

4.6 Review of the governance bodies and water users within the River

Nene catchment

A number of organisations are involved in the management and stewardship of the River Nene corridor, operating with both formal and voluntary involvement as detailed below in Tables 4 and 5.

Name of organisation	Jurisdiction: Authority and type of water use	Jurisdiction: Geographical	Institutional History
Anglian Water Services (AWS)	Legally required to supply water. Sewerage services are distinct. All water supplied is potable. Takes responsibility for assured water supply and water quality. Regulated by EA, OFWAT and DWI (see below). Formed in 1989 during the privatisation process.	Regional	Nationalised water boards, themselves formed in 1974 based on entire river catchment principles.
Dept of the Environment and Rural Affairs (DEFRA)	Government ministry which is ultimately responsible for water resources. Whilst DEFRA forms national environmental policy the deployment of those policies is the responsibility of the Environment Agency, OFWAT and DWI.	National	A new ministry, formed in 2001, which absorbed the role of the Ministry for Agriculture, Fisheries and Food (MAFF). DEFRA was allocated Environmental responsibilities on the break up of the Department for the Environment, Transport and the Regions (DETR) in 2001.
Environment Agency (EA)	Governed by DEFRA and the National Assembly for Wales, the EA is responsible for regulating the water companies for environmental water quality and also has a role in protecting the riverine environment. Formed in 1995, operational in 1996, by the Environment Act.	National. EA offices are regionally sited and capacities are split across activity e.g. navigation, licensing, drought planning and flood defence.	Replaces National Rivers Authority who had in 1986 replaced the 10 regional Water Boards.
Name of organisation	Jurisdiction: Authority and type of water use	Jurisdiction: Geographical	Institutional History
County	Responsible for strategic	Regional	This administrative

Councils (Northants, Cambs, Lincs)	planning within the county including highways development and maintenance. Work alongside the Office of the Deputy Prime Minister to coordinate regional planning. Duty to consult with water companies regarding new planning. Formed 1884 under the Local Government Act.		level has been operating since 1888, with changes to limit and scope of authority concerning different fields over that time.
Peterborough City Council	Responsible for all local authority duties (single tier structure unlike county and district councils). Formed 1988.	Local	Changed from dual tier to single tier after local government reforms in the 1990s.
District/ Borough Councils (East Northants, East Kettering, Fenland)	Responsible for housing, planning applications, environmental health and leisure, amongst others. Formed 1884 under the Local Government Act.	Local	This administrative level has been operating since 1884, with changes to limit and scope of authority concerning different fields over that time.
Parish Councils	Meet monthly, council voted by parish electorate. Forum through which communities can comment on and make suggestions to the next tier of local government. Formed 1884 under the Local Government Act.	Local	Civil organisations, over 400 years old. 1884 Local Government Act separated the function of church and community development.

Table 4: Profile of the governance bodies operational along the River Nene catchment

Excluded from Tables 4 and 5 (see below) are those governance bodies who only operate at a regional or national level. This research is only interested in those organisations that are operational at the catchment level. This then excludes the DWI, Ofwat and the EU.

Descriptor of water user	Jurisdiction: Interest	Jurisdiction: Geographically	Institutional History
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The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

Domestic customers	Have legal rights to water of an assured quality. Also now have numerous other rights including prevention of disconnection and installation of free water meters at water companies' expense.	Local	N/a
Commercial customers	Have legal rights to be supplied with water. Non payment of water bills can lead to disconnection.	Local	N/a
Middle Level Commissioners (MLC)	An umbrella organisation which represents all the internal drainage boards (see below) within the River Nene catchment along the 'Middle Level' stretch of the river. Formed in the 17 th century in response to the large scale land drainage that was being undertaken the MLC negotiate with County Councils and land developers to agree rates and with neighbouring IDBs to organise schedules of work.	The Middle Levels stretch of the river, from Whittlesey (Cambs) north east to the St German pumping station in Cambs where the drainage system joins the River Great Ouse.	No
Internal Drainage Boards (IDBs)	To maintain drainage system to ensure agricultural land does not get flooded. Each IDB has its own development history.	Each IDB relates to a small pre-fixed area, historically divided.	No
National Farmers Union (NFU)	Has various roles as a representative and lobby group. In the Nene catchment farmers have multiple roles – both as IDB members and as small business owners. Formed 1908.	National	No

Descriptor of water user	Jurisdiction: Interest	Jurisdiction: Geographically	Institutional History
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RSPB	Has charity status. Owns and manages the Nene Washes, a wildlife site which combines protecting birds, fauna and flora with operating a traditional, sustainable stewardship. The site manager at the Nene Washes works closely with the lock keeper (who is EA staff) at the adjacent Dog –in-a-Doublet sluice to regulate water levels. Formed 1889.	Nationwide – own and manage the Nene Washes.	The Nene Washes abut the tidal lock, 11 miles inland. Flooding and drought can have a significant impact on the wildlife – low flow in spring can encourage predators to attack nests, high flow in spring can deter breeding.
Inland Waterways Association – Northampton and Peterborough branches	NGO, works as a lobbying organisation, representing the interests of boaters. Formed 1947.	National.	No.
Wildlife Trust (Northants/Cambs)	Supports the sustainable use of the countryside and the protection of fauna and flora. Formed 1912.	National.	Originally called the society for the promotion of nature reserves.

Table 5: Profile of water users along the River Nene catchment

4.7 Conclusion

This chapter has considered institutional change against the backdrop of the privatisation of the water sector. Sections 4.2 and 4.3 of the chapter mapped how the development of the English and Welsh water sector has created the 'governance constellation' in operation today. These tiers of governance clearly have a direct effect on how policy is deployed at catchment level. The increasing influence of the EU and its various water directives have an impact on how policy is formulated and rolled out. Policy does not simply respond iteratively to national and European imperatives, but is subject to temporal lags. These temporal lags mean that at the local level, governance becomes

sequenced by the respective operating bodies and their planning timetables.

Any one governance body, such as the EA for example, may be implementing identical policy goals but at different tempos.

Yet at the local level these policy goals have to be sequenced with the characteristics of each catchment, as this is the lowest scale of water resource governance. As we have seen these characteristics are comprised not just of river hydrology and catchment geology, topography and climate but also of a highly dynamic socio-demographic profile. This interface between water users and local governance bodies and between different governance bodies is cause for potential discord. Legitimacy, then, is potentially most at stress when trying to reconcile national policy with local level deployment.

Set against this background is the transformation of the cultural status of water with the privatisation process in 1989. The desk study has revealed that the historical evolution of the macro water management regime along with the dynamics of the local catchment leave many questions regarding adaptivity to water stress to be addressed. Whilst this thesis is now clear about the actors involved in water management in the River Nene catchment, and the relative status of governance bodies and water users within it, it is necessary to start isolating what role legitimacy plays within these relationships.

In order to do this work needs to be undertaken at the catchment level to assess the water issues with which each stakeholder group is concerned and

how water users and governance bodies relate to these issues. Before a catchment wide analysis can be undertaken, it is prudent to begin to map out issues and relationships to shape a wider survey. A scoping study is an ideal method of achieving this. Concentrating on one area of the catchment should also help draw out the complex of relationships between water users and governance bodies before a larger catchment wide piece of research is undertaken. These fieldwork activities are detailed in the following Chapter 5.

Chapter Five: Uncovering water users' values and perceptions; a catchment wide survey of domestic consumers

5.1 Introduction

This chapter seeks to describe in detail the scoping study and the household questionnaire (research activity 3/ fieldwork activity 2) outlined in Chapters 2 and 4. It also seeks to detail how data relating to legitimacy was collected.

The scoping study identified that there was no evidence of widespread rejection of current water governance policy at a grassroots level. Nor was there any evidence that institutions were viewed as ineffective. Individual water users and governance bodies appeared to have specific concerns which they would like addressed, but these do not threaten the overall stability of the local water management regime. In effect, the scoping study revealed that on the whole governance bodies and their associated policies were viewed as legitimate. They were therefore perceived as credible and reliable organisations.

It was necessary to elaborate these findings through the capture of water users' perceptions of the water environment and of water resource management, in a questionnaire that specifically targeted domestic household water users at a catchment wide level.

This chapter will go on to describe the way in which the household questionnaire approached legitimacy issues. As suggested in Chapter 2, perceived effectiveness is one indicator of legitimacy. In the list detailed below in Section 5.11, questions 15a – 15f raise these concerns. A number of other questions targeted key contributory elements of legitimacy (as outlined in Chapter 2) i.e. they deal with issues regarding trust, reliability and satisfaction, namely questions 5, 10, 11 and 12. In this way, the household questionnaire allowed the generation of material that examined water users' perceptions of legitimacy.⁵⁰

5.2 A Fenland Scoping Study

This first piece of empirical fieldwork undertaken for this thesis was a scoping study. The aim was to develop, through informal interviews of water users, a picture of the key issues which effect the catchment. This activity was not meant to be entirely comprehensive or exhaustive, but, rather, to set the agenda for subsequent fieldwork activities. With this in mind, the scale of the

⁵⁰ Two other preliminary issues need to be briefly outlined. Previous research in England and Wales has considered customer satisfaction with service delivery, water pricing, water safety and the general care of the water environment (including both riverine and coastal but excluding groundwater). This research has mainly been conducted by Ofwat, the Environment Agency and the water companies. Water company data is categorised as a company asset and so is not generally available for public consultation. This means that it is necessary to rely on water regulator surveys regarding national householder attitudes. One further difficulty was that there is no recent (i.e. post 1989 privatisation) literature which details householder attitude to freshwater issues along the length of an entire single catchment within England and Wales. Strang's 2001 study of the River Stour (located in Devon, England) does capture some of the issues of concern within this thesis, but the research is more anthropologically orientated, and was not a useful comparative study for this thesis.

activity needed to be limited to ensure the activity could be undertaken in a limited time and to maximise the research budget.

Respondents for the scoping activity were comprised of individuals who live and work around the River Nene and its hinterland. This included domestic householders, people who work within governance bodies responsible for the river, farmers who abstract from the river and others whose livelihoods or leisure time are directly connected with the catchment. Excluded are those respondents who do not demonstrate any interest or viewpoints connected with the river. In order to capture a wide range of views, opinions, experiences and expertise to build up this 'picture' of local riparian issues, the fieldwork aimed to include domestic water users, farmers, drainage experts, representatives of the local council, industrial users and leisure users. There was no minimum number of respondents required as the scoping activity was not attempting to be representative. Instead the emphasis was on capturing a diverse range of views.

The interviews were shaped explicitly around water issues.⁵¹ Interviewees were informed that the aim of the interviews were to understand in more detail how the river influences and impacts upon their lives. The level of expertise and specific interests differed with each respondent. This meant that flexibility in the duration and direction of each interview was essential.

⁵¹ The interviews utilised six generic themes as a way to shape the interviews: flooding, drought, water quality, governance, the economy and a category loosely entitled the 'local agenda'.

5.3 Conclusions from the scoping study

The scoping study highlighted a range of concerns on the local agenda, and also drew attention to the differences in response between formal and informal governance bodies and water users.⁵² The activity stressed the need to be aware that even though the English and Welsh water management regime is tightly regulated (see Chapter 4), there are still grey areas of responsibility that could be described as suffering from regulatory 'patchiness'.⁵³ Water stress in particular may further strain the relationships between these governance bodies if there is no clarity in areas of jurisdiction or consistency in policy application. These findings seem to indicate that there may be catchment management for some organisations, such as AWS and the EA, but this may not translate into a catchment vision; which is the intent behind the WFD.

Responses from domestic users in this fieldwork activity seems to indicate high levels of satisfaction with water governance bodies. A necessary further research activity was required to investigate if this is the case further up the catchment. In other words, are there high levels of domestic water user

⁵² The interview transcripts are available for examination.

⁵³ One example includes attempts by the EA to withdraw abstraction licences from farmers if they are not used and removing licences from farmers not using water efficient irrigation systems yet allowing the water companies to maintain generous licences without any caveat regarding using their full quota or reducing leakage rates. Another area of regulatory patchiness is the gap between drought orders being recognised as necessary by the EA and the length of time it takes DEFRA to approve them, by which time the crisis has already peaked; the 1992 drought was used as an example.

satisfaction with potable water services and the local water environment throughout the catchment or is this the preserve of the Fens?

It was decided to undertake a household questionnaire of all the catchment in order to answer this question and to provide more data concerning the needs and expectations of this water user group. Added to this is the opportunity to discover what kinds of policy options to adapt to water stress may, or may not, be deemed legitimate by householders. Details of this questionnaire will now be discussed.

5.4 Methodological issues in relation to the household questionnaire

The domestic water user survey sought to address the following five specific research questions:

- 1) What are the dominant perceptions that consumers hold with regards to current water provision in terms of service, value, quality, safety and reliability?**
- 2) Are consumers aware of any recent changes to their water environment (e.g. increasing water stress)? If so, is it possible to catalogue these changes e.g. in terms of rate of change, cause of change and effect of change?**
- 3) What range of possible future water policy options to ameliorate water stress are consumers willing to accept?**

4) Post privatisation of the sector, do consumers view water governance bodies as a coherent set of institutions?

5) Is it possible to discern the existing nature of legitimacy relationships between water users and governance bodies through isolating contributory issues such as trust, communication, longevity, safety and policy innovation?

The success of the fieldwork in addressing these questions and their direct contribution to the overarching thesis questions will be addressed in the discussion section at the end of the chapter.

5.5 The selection of the fieldwork activity

A household survey of domestic water users was selected as the fieldwork activity (Fowler, 2002; Czaja and Blair, 1996; Turner and Martin, 1984). This was a result of various factors. Given the geographical scale of the research, temporal limitations on the research and the available respondent pool, it was determined that a household survey would elicit the most useful information. As the aim of the research was to document a set of responses rather than elicit opinions, it was also decided that a household survey was the best way forward.

Other options were considered. A focus group approach to triangulate⁵⁴ the issues found in the Fenland activity was rejected due to a combination of lack of researcher skill in this method and a reluctance to engage with forms of group participation which can be prone to what Bourdieu terms 'officialising strategies' within which dominant participants set the agenda for discussions (Bourdieu, 1977, p.38 - 43). A telephone survey was also rejected. This was because the complexity of the proposed questions, and the need to rely on prompt cards and utilise diagrams (de Leeuw, 1992), made the telephone interview unsuitable. A postal survey was also rejected as low rates of response are usually generated by this method (Lynn, 1996a).

Having determined the research method, a sample framework was drawn up to ensure that the survey was demographically representative of the catchment as a whole. It was also important to ensure the correct proportion of urban and rural respondents. To provide statistical representativeness the ideal number of respondents was determined as 390.

5.6 The deployment of the fieldwork activity

It was determined that the study would be based on an interviewer administered questionnaire survey of 390 respondents living in the catchment

⁵⁴ Triangulation is the process through which empirical fieldwork results are cross checked against one another to test for the robustness of the research findings. See Lynn, 1996b.

served by the River Nene.⁵⁵ A quota sampling approach was used. Quotas were fixed on the number of people in a household (1, 2, 3 or more) and the housing type (detached, semi-detached, terraced, other). Past research has shown that water use⁵⁶ is affected by household size, the number of occupants and the property type of the dwelling (Sarac *et.al.*, 2002). These variables, along with socio-demographic data such as age, gender and occupation, enable the identification of household and type of consumer along the catchment. As the rationale for the study is the identification of consumer responses to current performance in the water sector, the ability to ascribe responses to different types of consumer is invaluable.

The development of the questionnaire and its deployment were carried out in accordance both with the 1998 Data Protection Act and using the ethical research guidelines provided by the British Sociological Association (BSA, 2002).

5.7 Development of the format of the draft questionnaire

Having identified that a catchment wide survey was the requisite scale for the fieldwork and having identified that householder response was the research objective and having isolated the five research questions (Section 5.4), the next decision was to isolate what questions should be addressed.

⁵⁵ The River Nene catchment covers the counties of Northamptonshire, Cambridgeshire and Lincolnshire.

⁵⁶ Use understood both in terms of volumetric consumption and patterns of use.

Seven key topic areas addressed by the questionnaire:

- (1) Environmental concerns**
- (2) Individual perceptions and knowledge of water resource management**
- (3) Individual knowledge of the drinking water cycle**
- (4) Water uses and perceptions of water quality**
- (5) Water prices and related behaviours**
- (6) Water saving behaviours**
- (7) Perceptions of in-house recycling systems**

Capturing a wide range of data was felt to be necessary to enrich an understanding of respondent perceptions and opinions. It would also allow an understanding of a variety of topics which did not seem to have been previously addressed by water governance bodies' surveys and opinion polls.

Question development for each of the seven sections utilised both past surveys and included some novel experimental questions. Using extant questions was not a process of cutting corners in the design of the research activity, but a decision to include 'control' questions to compare the results of the study with those of past surveys. Novel questions were initially tested on an ad hoc basis with colleagues to ensure that wording formats made sense to respondents and generated an expected range of answers.⁵⁷ Several

⁵⁷ In other words, the question generated similar responses and therefore was easy to understand.

iterations of both question wording and section presentation occurred during this ad hoc stage of questionnaire compilation.

5.8. Development of a pilot study

Once the outline format of the questionnaire had been drafted, a pilot of 20 questionnaires was undertaken. The respondents were selected at random and were not from the River Nene catchment. The respondents included those with no connection to water resource management and some with a degree of expertise in water recycling issues and water management concerns. These latter respondents were included to ensure that the nature of the questions used and the diagrams presented were technically accurate.

Feedback from the pilot stage identified three key limitations with the pilot questionnaire:

(1) Lack of clarity of question wording: This affected both how respondents answered the question and can lead to uncertainty about what the question was asking.

(a) This first issue concerned how respondents answered the question. This is not a novel problem with qualitative surveys that include both closed and open response questions.⁵⁸ The aim of the pilot stage is to determine those open

⁵⁸ A 'closed' question provides a respondent with predetermined limited response options e.g. 'yes', 'no' or scalar options e.g. 1 to 10. 'Open' questions allow respondents to provide any answer they feel the question requires. Unless specified these answers are always verbal.

response questions that are ambiguous or misleading. Rewording several of the questions to remove ambiguities, or at very least reduce the incidence of anomalous answers, was possible at this stage. This was assisted by several of the respondents providing alternative suggestions to improve clarity of wording.

(b) Having revised what types of answers were generated by the question it became clear that ambiguity could arise because respondents did not understand the aim of the question. This led to a revision of the aim of several of the questions.

(2) Inclusion of too many questions. Given the opportunity the household survey presents of gathering a wide range of data, the temptation faced by the researcher is to include a large number of questions within each of the section headings. A wide range of literature is available which details optimum question numbers within surveys (see Fowler, 2002; Czaja and Blair, 1996). Much prior research has also been undertaken on the ideal length of interviews. For household surveys which are unique⁵⁹ an upper time limit of thirty minutes is recommended (Fowler, 2002).

After the pilot study it became clear that there were both too many questions, and the questionnaire could easily exceed its twenty five minute interview boundary. This creates a problem of respondent fatigue that can affect the quality and/or nature of his/her response. The excessive number of questions

⁵⁹ i.e. there is no relationship between interviewer and respondent and the survey is not going to be repeated at some point in the future,

also impacted on the realistic expectations of fully utilising the data within the scope of the research timeframe. As a result of the pilot it was decided to scale down the number of questions.

(3) Coding of open response questions. Careful coding is essential for accurate data analysis and a structure needs to be in place before the main survey takes place. The pilot provided an opportunity to determine the range of open response answers and to create a useful and comprehensive, though not exhaustive, coding system.

The pilot also highlighted expected errors such as repetition in question number, typos, poor grammar, inconsistencies with response categories such as five options in one question and three in another, and confusion in instructions to interviewers (such as when to reveal show cards and when to ensure the respondent knows that answers were to be their personal response rather than that on behalf of the entire household).

5.9 Timing of fieldwork

As the questionnaire covered concerns such as water quality, trust in potable water providers and water pricing issues, it was imperative that the fieldwork was undertaken at a time when there was no dominant media issue connected with freshwater resources nor any public health outbreaks.

A secondary issue was ensuring that the fieldwork did not coincide with any holiday period that may have affected the availability of respondents. As the questionnaire was designed for household respondents to be undertaken at their home address, it was necessary to ensure that interviewers selected times of the day and week that were convenient for respondents. Interviewers also had to 'hit' the correct demographic profile as outlined in Section 5.6. Because the questionnaire was due to be conducted in June it was important to ensure interviewers' kits were fully prepared at the beginning of the month so that all questionnaires would be completed before the commencement of the school holidays in mid July.

Due to the scale of the survey and the timing restraints, an independent research company was used to undertake the interviewing process and first stage data coding. The company complied with research industry protocols. These include employing supervisors to check that a proportion of respondents had actually been interviewed, had signed off the interview and that the interviews had been undertaken according to ethical and Data Protection Act guidelines.

5.10 Data input and analysis

The data was collected by interviewers at the respondent's home address and then coded using an agreed structure and inputted into an SPSS 11.0 spreadsheet.

All analysis was completed using SPSS 11.0 software, with graphs presented in Excel. For all open response questions, the data entry operator created subject headings for the most common responses and placed those difficult to initially categorise into an 'other' column. These 'other' categories were then analysed and re-coded at a later stage. Interviewers used the International Standard Classification of Occupations ISCO-88 to classify the occupations of respondents after asking them about their profession. After data inputting was complete, 10% of the spreadsheet entries were back-checked against the original completed questionnaire to check for errors. The data was then 'cleaned'. This process involved deleting obvious errors (such as double entries) and removing entries that could not be accepted as valid responses due to poor data logging techniques at the time of the original interviews.

Variables were then categorised or aggregated. For example, the variable 'age' is more usefully employed in data analysis processes when assigned into standardised age group categories.⁶⁰ Once this aggregation stage was completed the data set was re-coded to remove outliers. Outliers are responses which are uncommon or unexpected, and which can lead to the misinterpretation of results. An example evident in the study reported here was the inclusion of responses from interviewees aged 14 and under. These responses, whilst valid, lead to difficulties in interpreting those results where age was used as a variable. This is because any chi-square tests or clustering

⁶⁰ The category used within this data analysis followed the International Standard of Classification.

exercises are rendered insignificant as the outliers prevent the data from showing a normal distribution. These outliers are always few in number. As this study was not using age as an independent variable, and particularly as individuals of ages 14 and below can be assumed to not make critical household decisions, these responses were removed.

The results of the survey, as reported below, do not display 'don't know' or 'no answer' responses unless such response categories greatly impact on the result. This type of response would normally indicate that the respondent either did not understand the question or felt uncomfortable in answering the question. A preliminary screening of the data showed that there were few questions where 'don't know' was a significant element of the total response. To remove the 'don't know' and 'no answer' responses the appropriate questions were re-coded. This procedure is accepted practise within survey reporting (Fowler, 2002). Any questions with a high proportion of 'don't know', 'no answer' or missing responses are, however, noted in the results section below.

5.11 Results

The questionnaire from which the questions discussed below are drawn from is comprised of 52 questions⁶¹: The full questionnaire is presented in Appendix 1.

⁶¹ Of these 52 questions 17 also have multiple parts labelled 'a', 'b' etc.

As there is such a large data set generated by the questionnaire it would be inappropriate to try to discuss all findings within this one chapter. Rather, as the survey contributes to a detailed exploration of the thesis hypothesis, this chapter will focus in detail on a number of questions taken from the survey which are most relevant to the thesis' goal.

Using the five research questions, outlined in Chapter 2, as a guideline, 15 questions have been isolated, drawn from six of the eight subject headings of the questionnaire. These fifteen questions as they appear chronologically in the questionnaire are questions 5, 7, 8, 14, 22, 23, 24, 32, 33, 43(a), 43 (b), 43(c), 44, 45 and finally 46.

It is felt that these fifteen questions sufficiently address the research questions without overburdening the chapter (or indeed the thesis) with excessive detail. Any fewer questions would not do justice to the wealth of data generated by the questionnaire. However, where relevant, this chapter will draw on the results of other questions when they provide useful complementary information. The fifteen questions are those that specifically cover issues of IWRM function, perceptions of water governance bodies' achievements, trust in IWRM processes and finally the legitimacy issues of possible future policy options.

The following sub-sections of the chapter will detail the data analysis approach taken to examine the survey data. Within each section the fifteen

questions will be analysed, referring to other questions where appropriate. Problems encountered during the data analysis stage will be discussed for each data analysis activity.

Frequencies of response

Throughout the survey 'don't know' and 'no answer' responses amounted, on average, to less than 5 per cent of the total quantitative response.⁶² In view of this fact it was felt unnecessary to include them in the final frequency graph for each question.

Aside from the actual response information they contain, the frequency graphs reveal new insights about domestic water consumers' willingness to engage with water resource management topics. The graphs highlight that respondents are willing to be involved with water management issues of different levels of complexity (these findings are explored in more detail in the discussion section of this chapter). This suggests that water users, also described here as domestic consumers, are willing to engage with a variety of water concerns and even explore new avenues of water policy and water technology which may be unfamiliar to them. As this willingness takes place within the context of water as a 'non issue' it indicates that there is a background level of interest in water related topics.

⁶² This figure was calculated by selecting six questions at random from the questionnaire and calculating the percentage for 'don't know' and 'no answer' responses compared with categorised response. These six questions represent 10% of the total questionnaire number of fifty two.

Fifteen frequency graphs are presented below. The graphs are displayed with frequency information, rather than percentages, to illustrate the actual response from a possible total of 390 interviewed respondents. As the results of the frequency graphs are self explanatory the discussion of the graphs will appear in the 'discussion' section of this chapter.

Question 1: *Water resource management is a term used to describe the way in which freshwater resources such as rivers, reservoirs and underground aquifers are managed by water companies and government bodies to ensure reliable, safe supply. In your opinion, is water resource management in your local area an issue that needs to be addressed:*

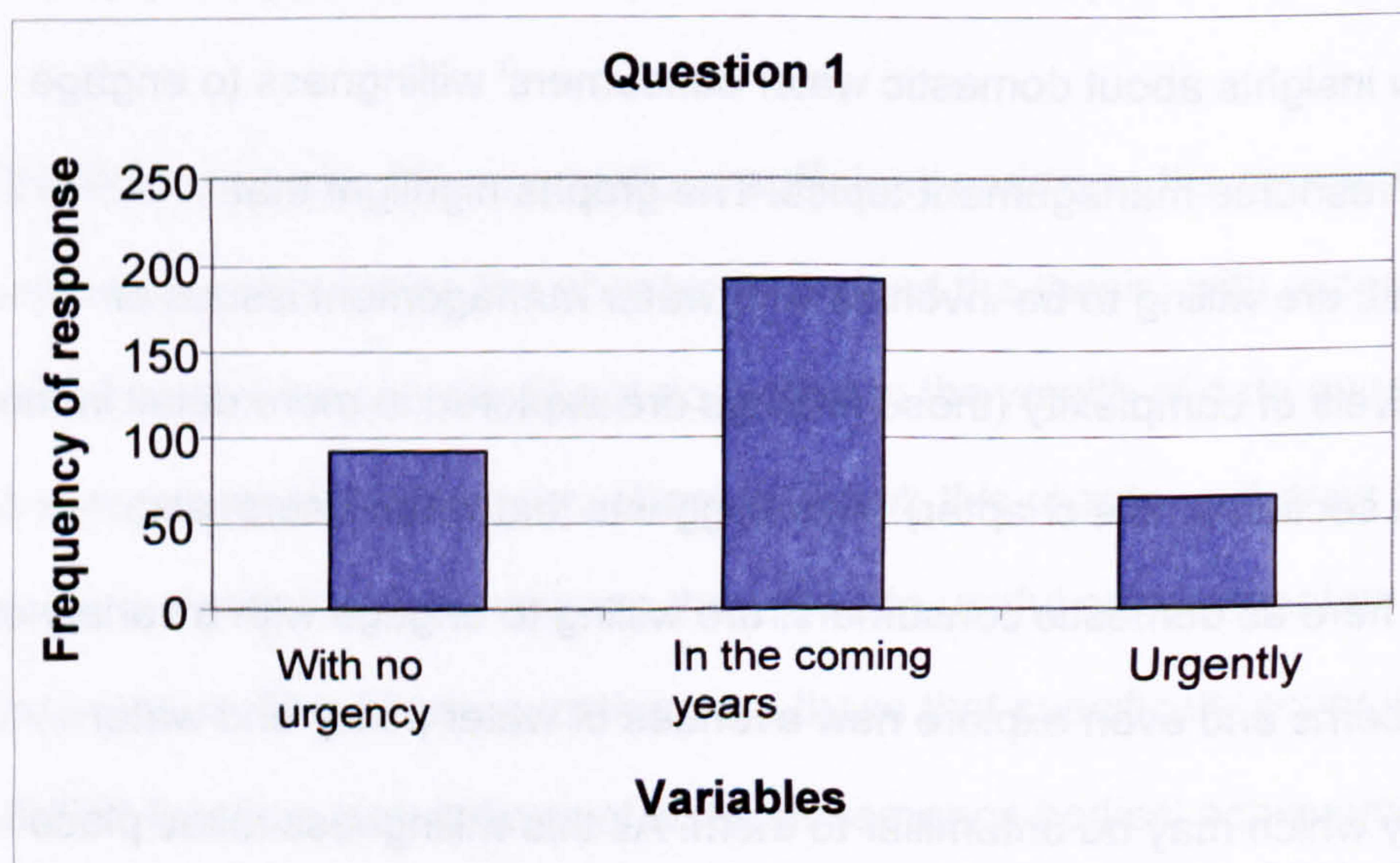


Figure 7: Graph to show perceived urgency of local water management issues

Question 2: *Would you say the overall quality of the water environment in your surrounding area in the recent past, i.e. the last 10 years, has:*

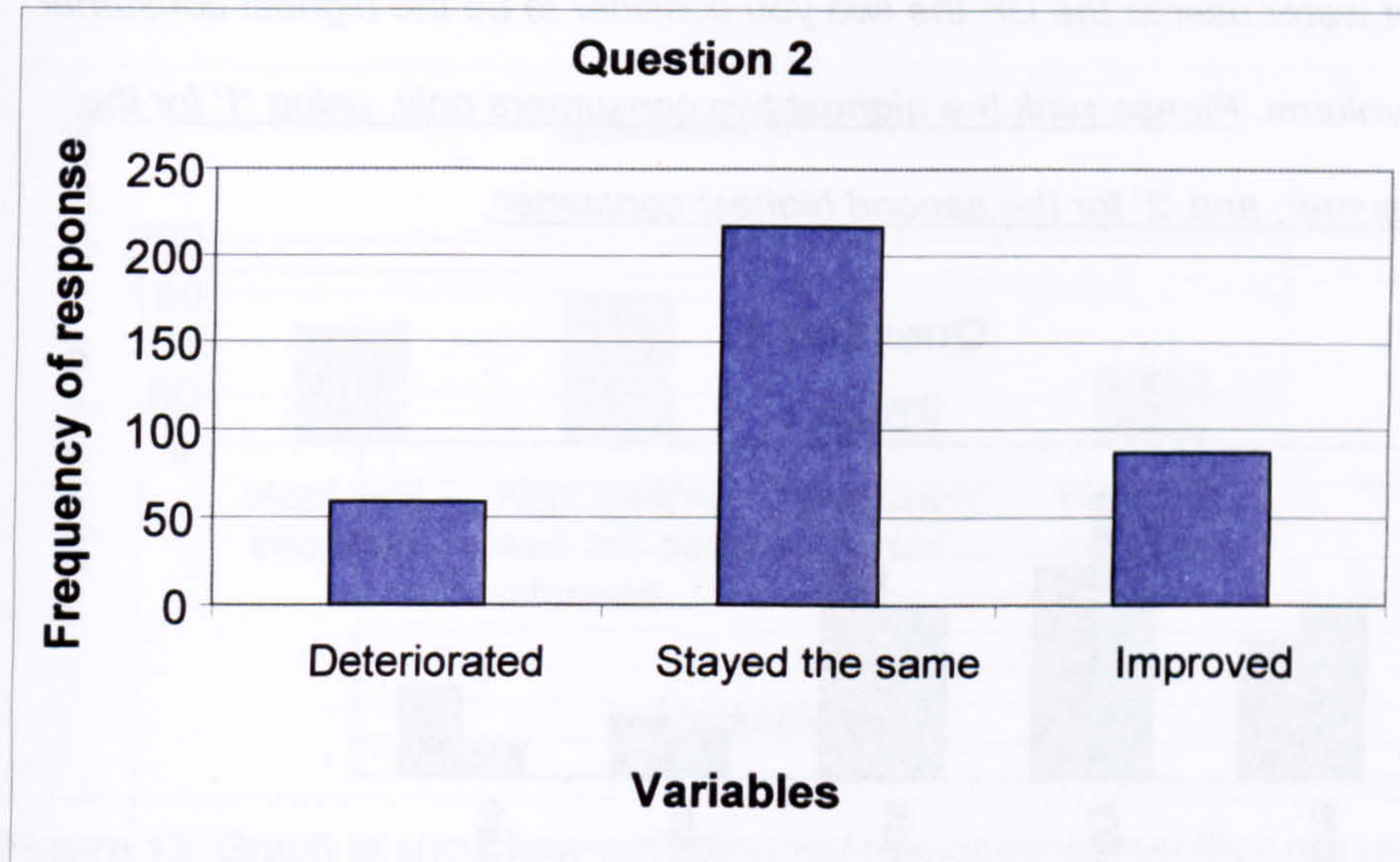


Figure 8: Graph to show perceived change in quality of respondent's local water environment

Question 3: *Would you like the opportunity to be involved in discussions and debates on the present and future management of water resources?*

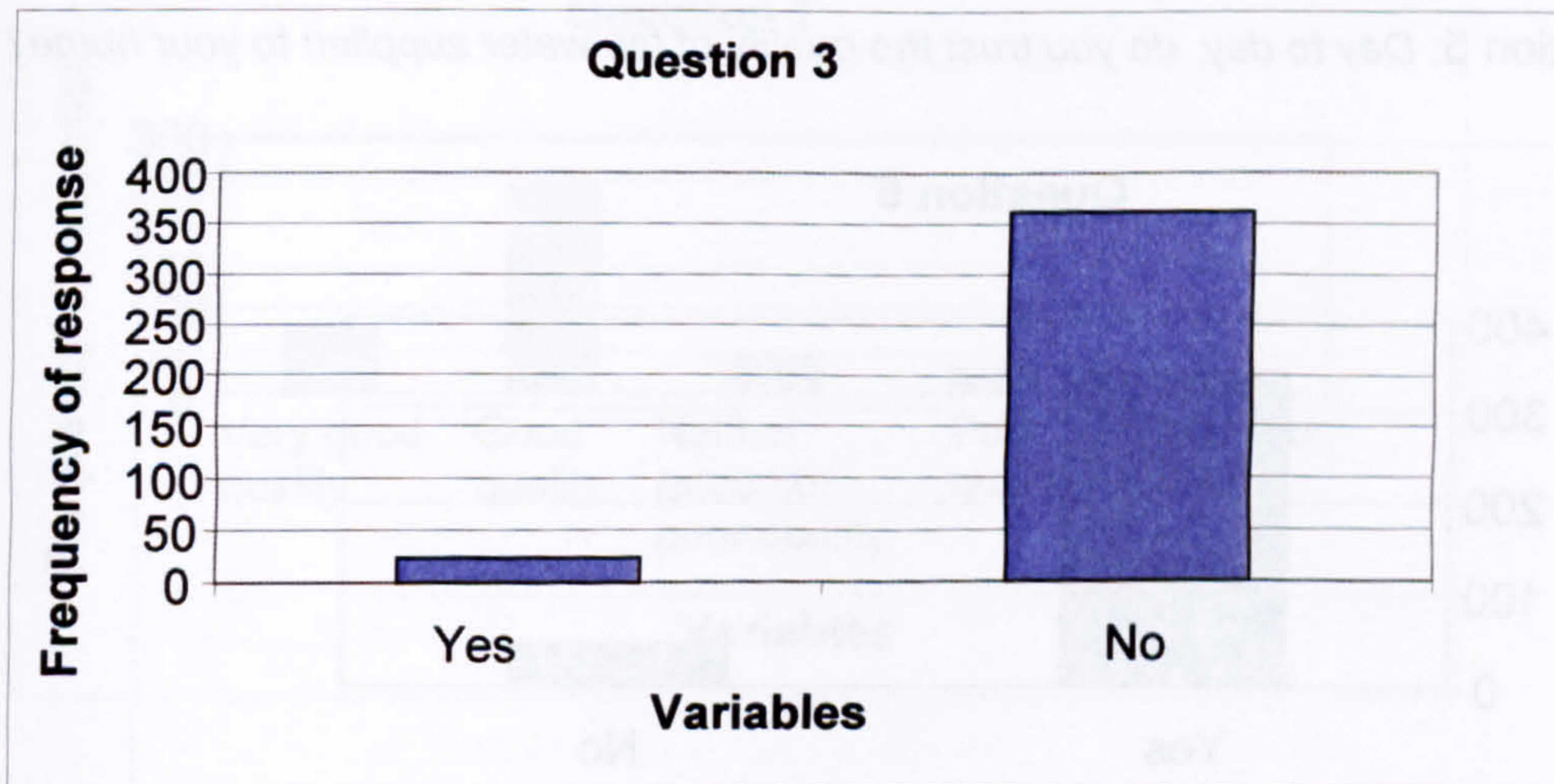


Figure 9: Graph to show willingness to participate in water management processes

Question 4: Having looked at **Showcard F** please select from the following five categories of water user in the UK the two you consider to be the highest consumer of water by volume. Please rank the highest two consumers only, using '1' for the highest consumer, and '2' for the second highest consumer.

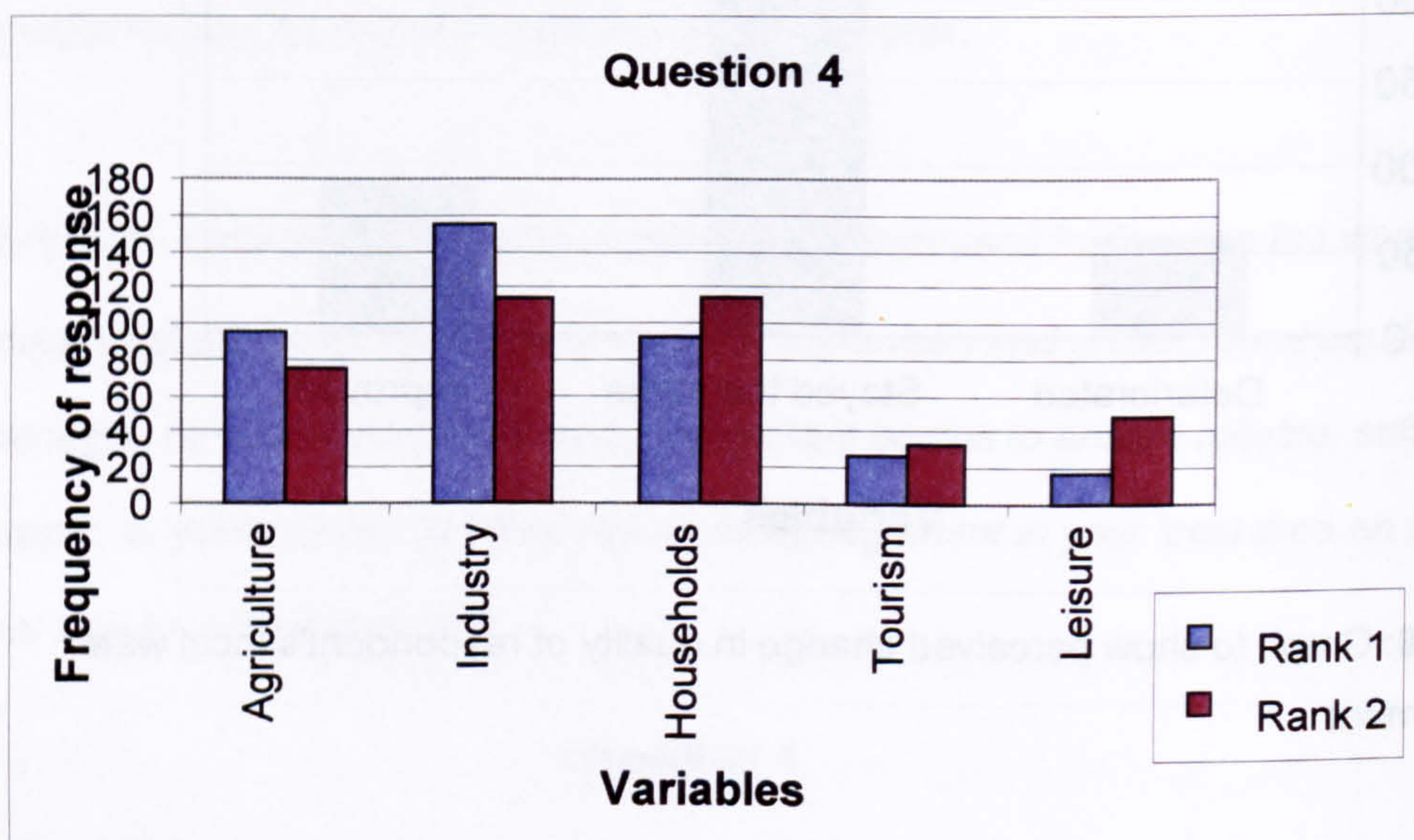


Figure 10: Graph to show rankings of water use per sector

Question 5: Day to day, do you trust the quality of tap water supplied to your home?

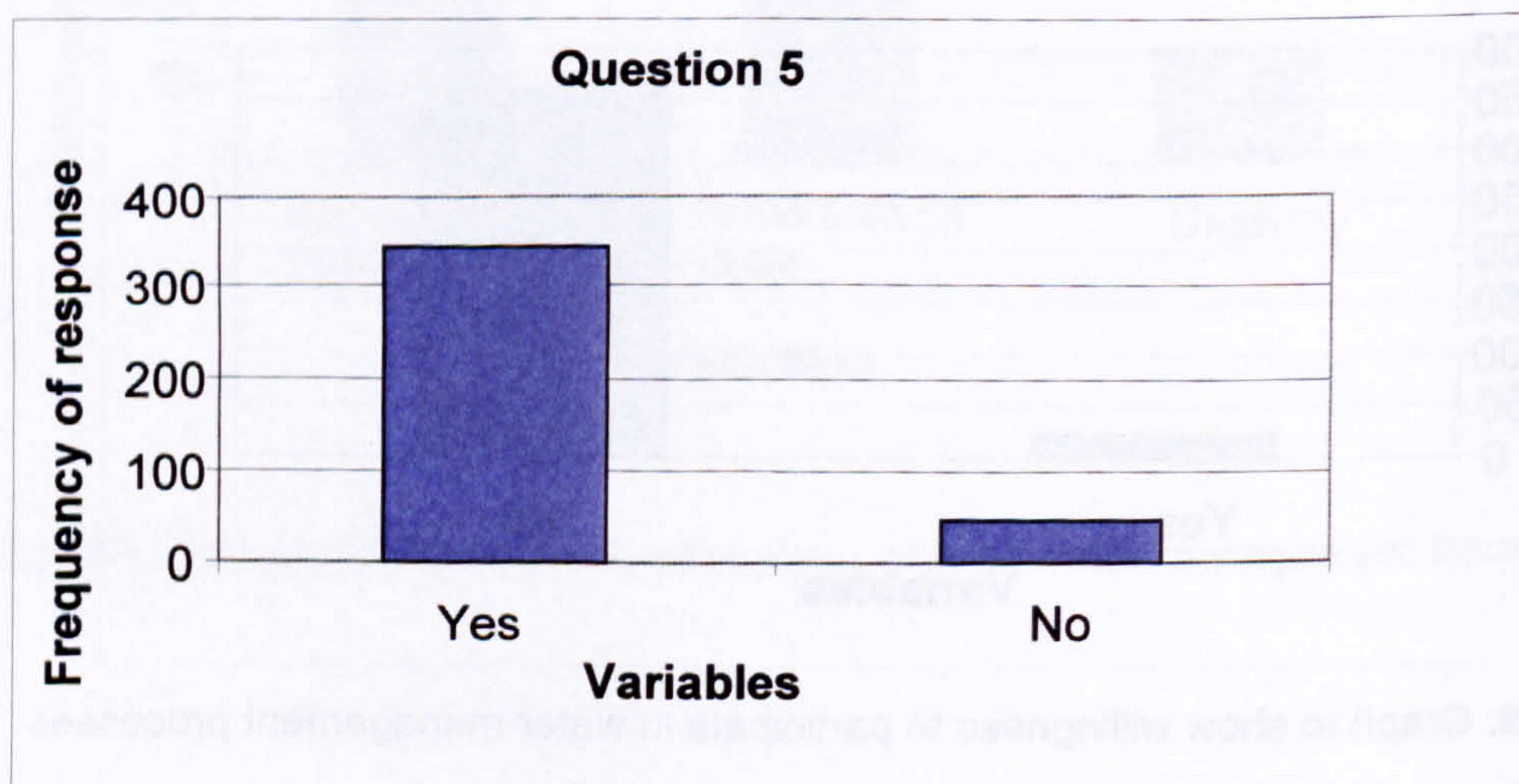


Figure 11: Graph to show trust in domestic potable water supply

Question 6: Thinking about the quality of the tap water supplied to your household would you say you are:

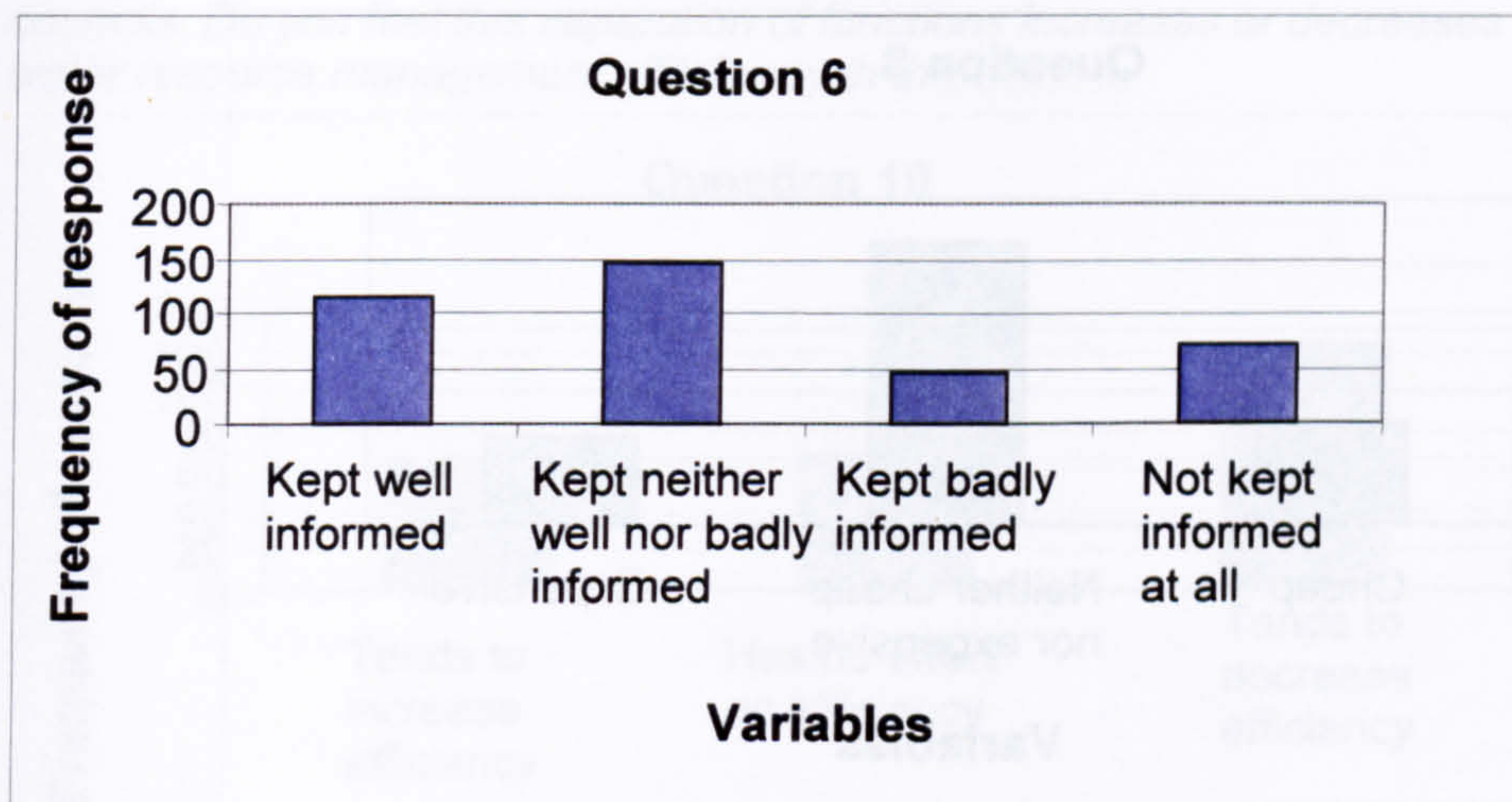


Figure 12: Graph to show how well informed respondents feel they are regarding domestic potable water supply quality

Question 7: Personally, would you say that your tap water is:

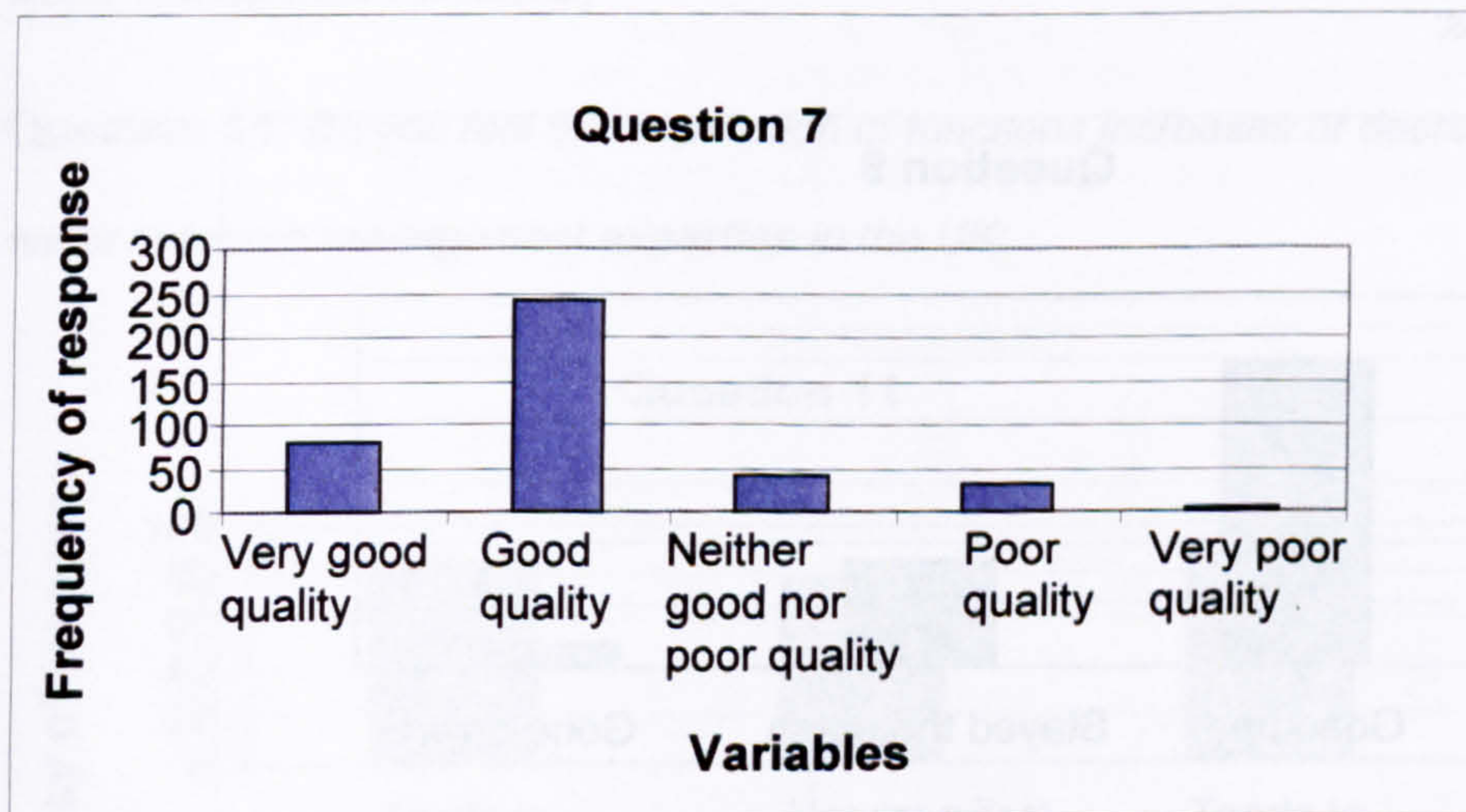


Figure 13: Graph to show perceived quality of domestic potable water supply

Question 8: On the whole, do **you** think that the tap water that is supplied to your household is:

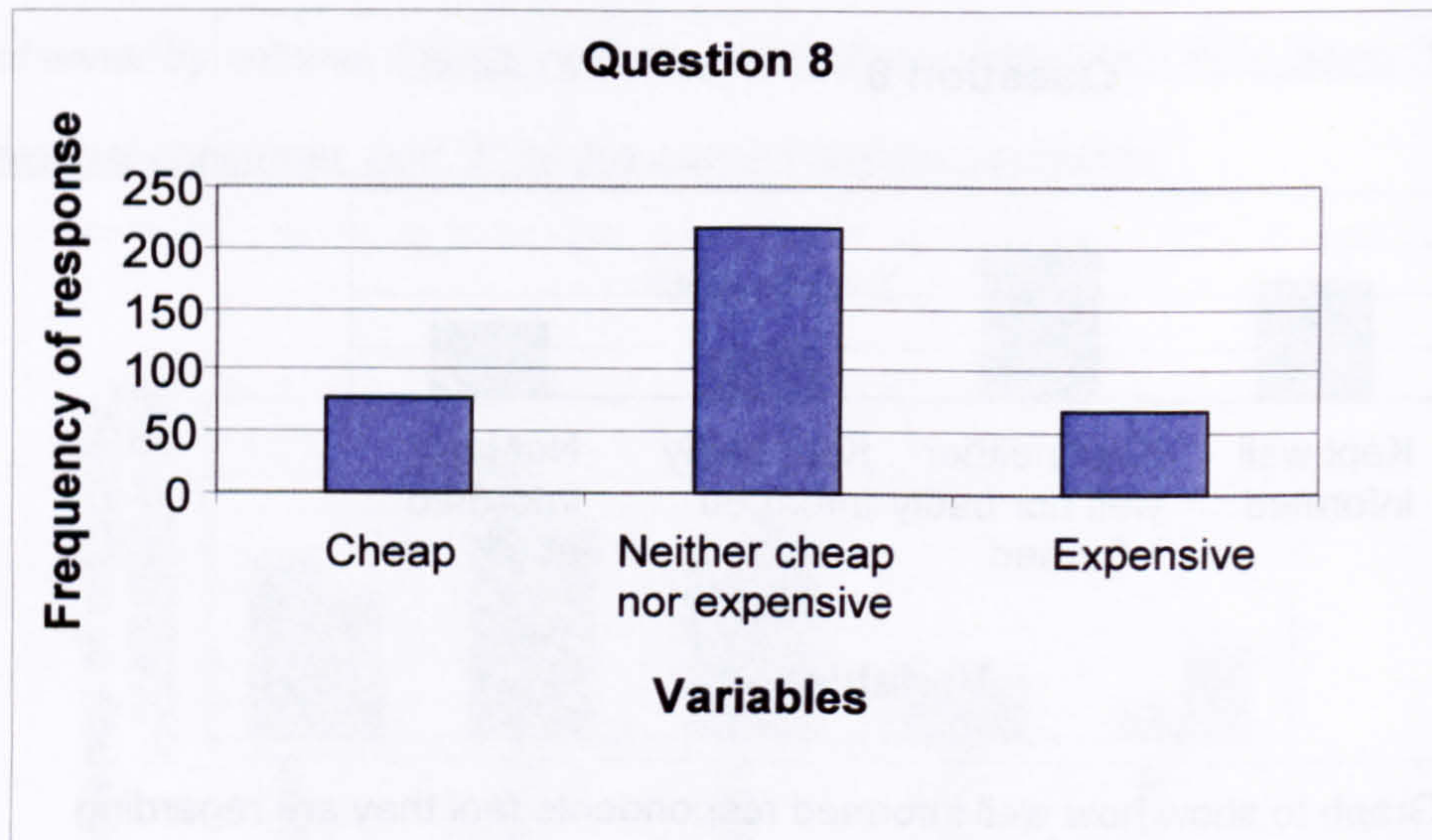


Figure 14: Graph to show perceived price value of domestic potable water supply

Question 9: Do **you** feel that in the last 10 years, the overall price of your household water bill has:

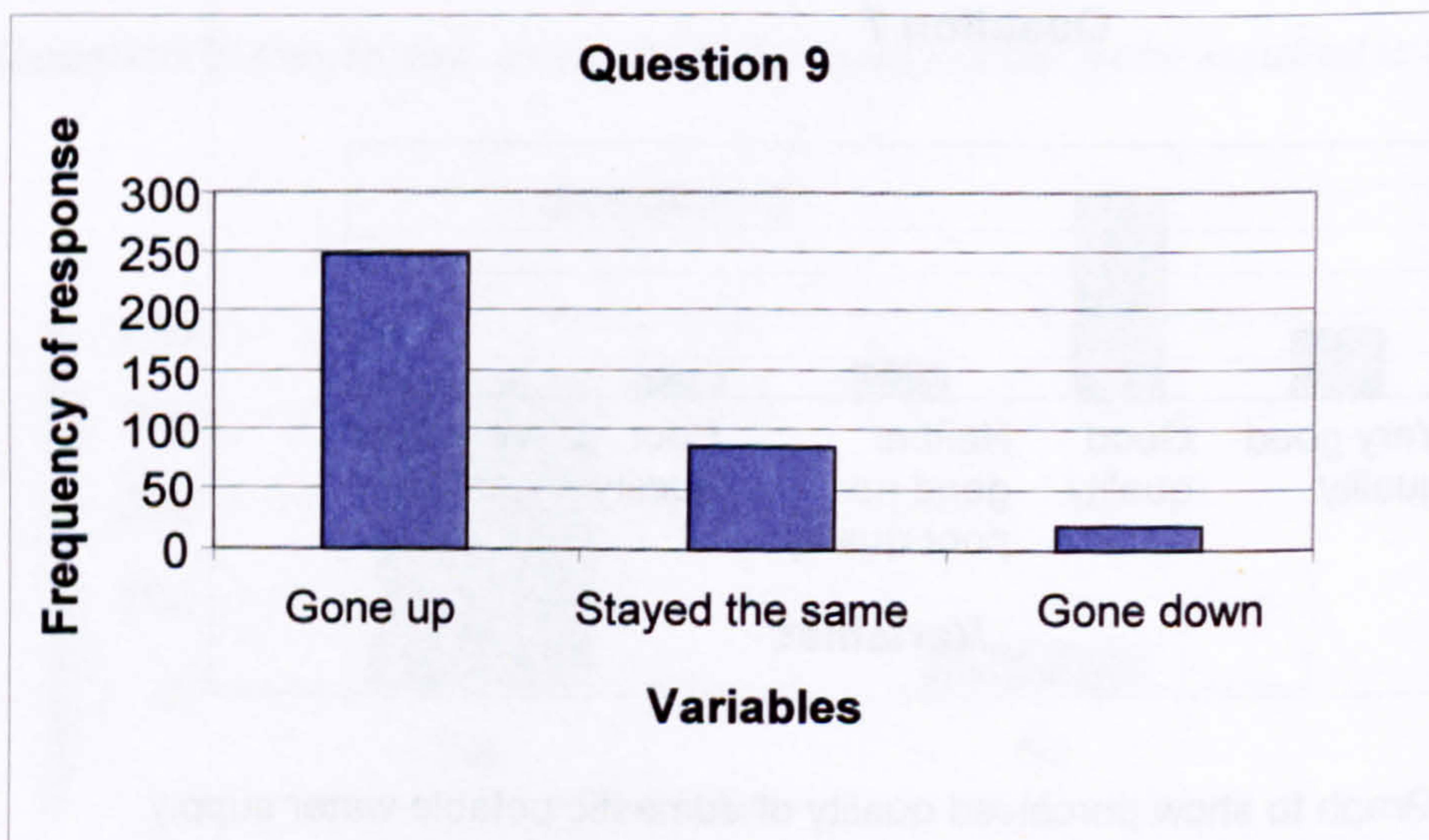


Figure 15: Graph to show perceived fluctuation in price value of domestic potable water supply

Question 10: Water resource management has evolved over time with different bodies taking responsibility for different management functions. For example, water supply is the legal responsibility of the water companies; water quality is the overall responsibility of the Environment Agency and land use planning is managed by local councils. Do you feel this separation of functions increases or decreases overall water resource management **efficiency** in the UK:

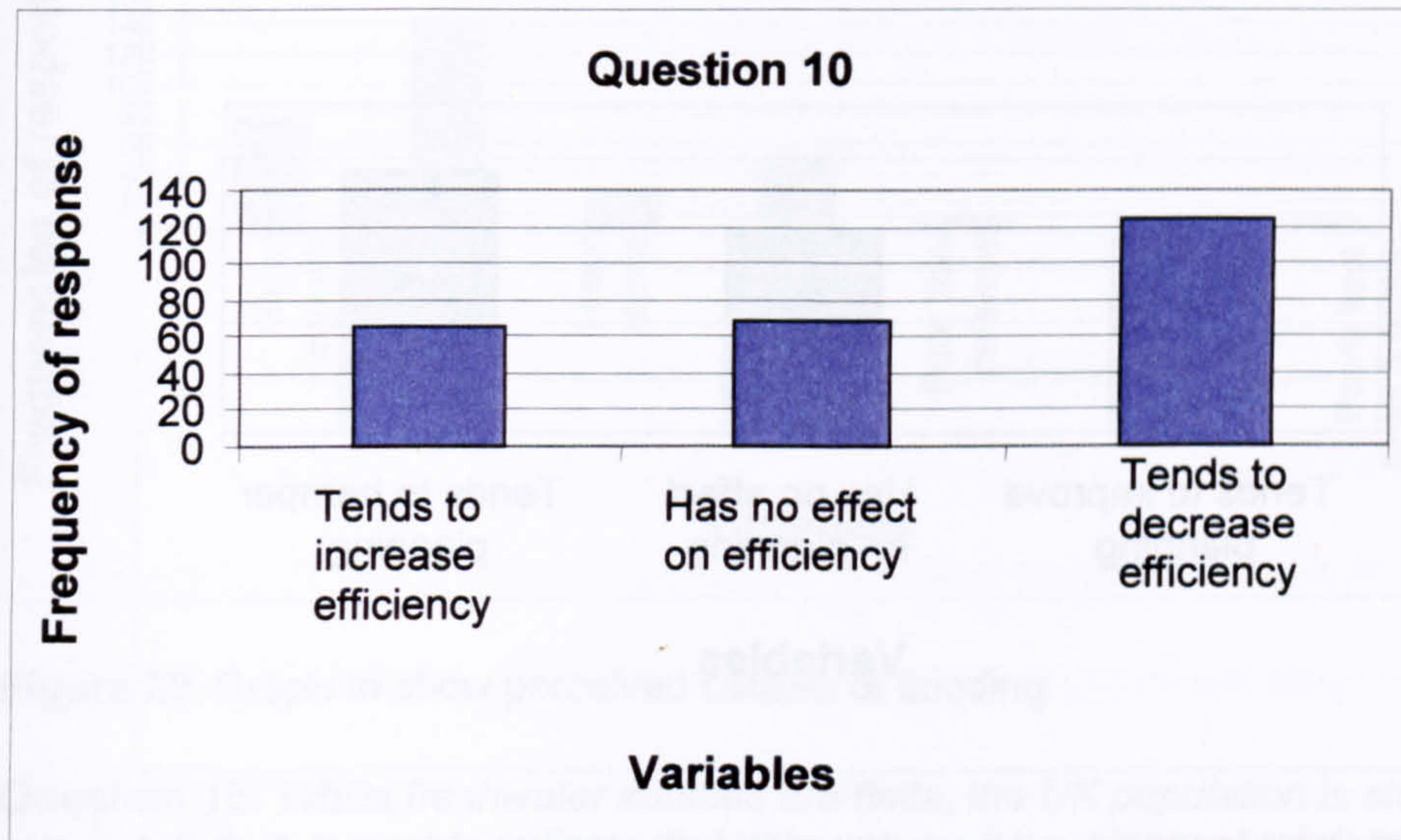


Figure 16: Graph to show the perceived impact of separate spheres of operation on water management efficiency

Question 11: Do you feel this separation of functions increases or decreases overall water resource management **expertise** in the UK:

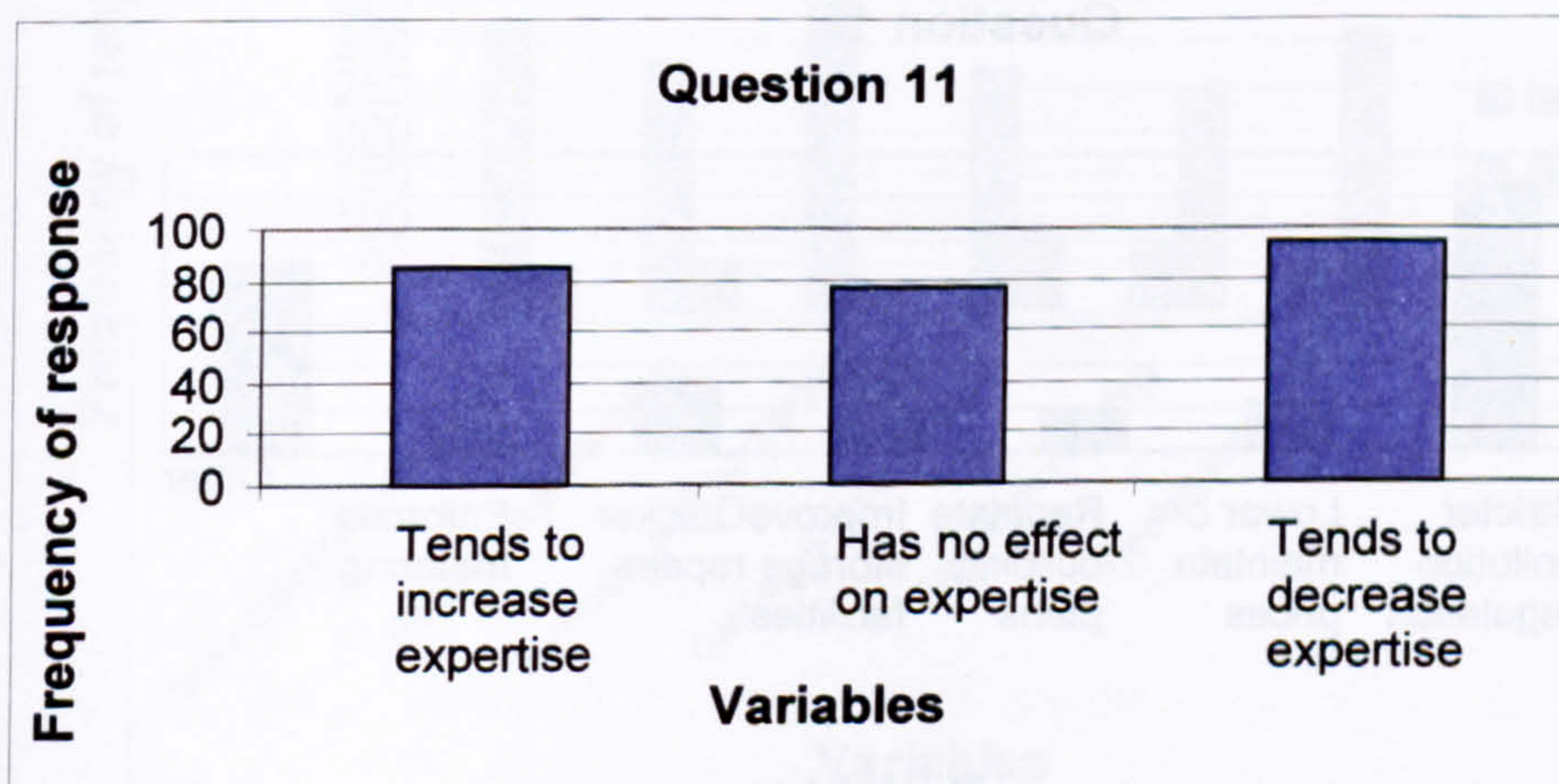


Figure 17: Graph to show the perceived impact of separate spheres of operation on water management expertise

Question 12: Do you feel this separation of functions improves or hampers overall water resource management **planning** in the UK:

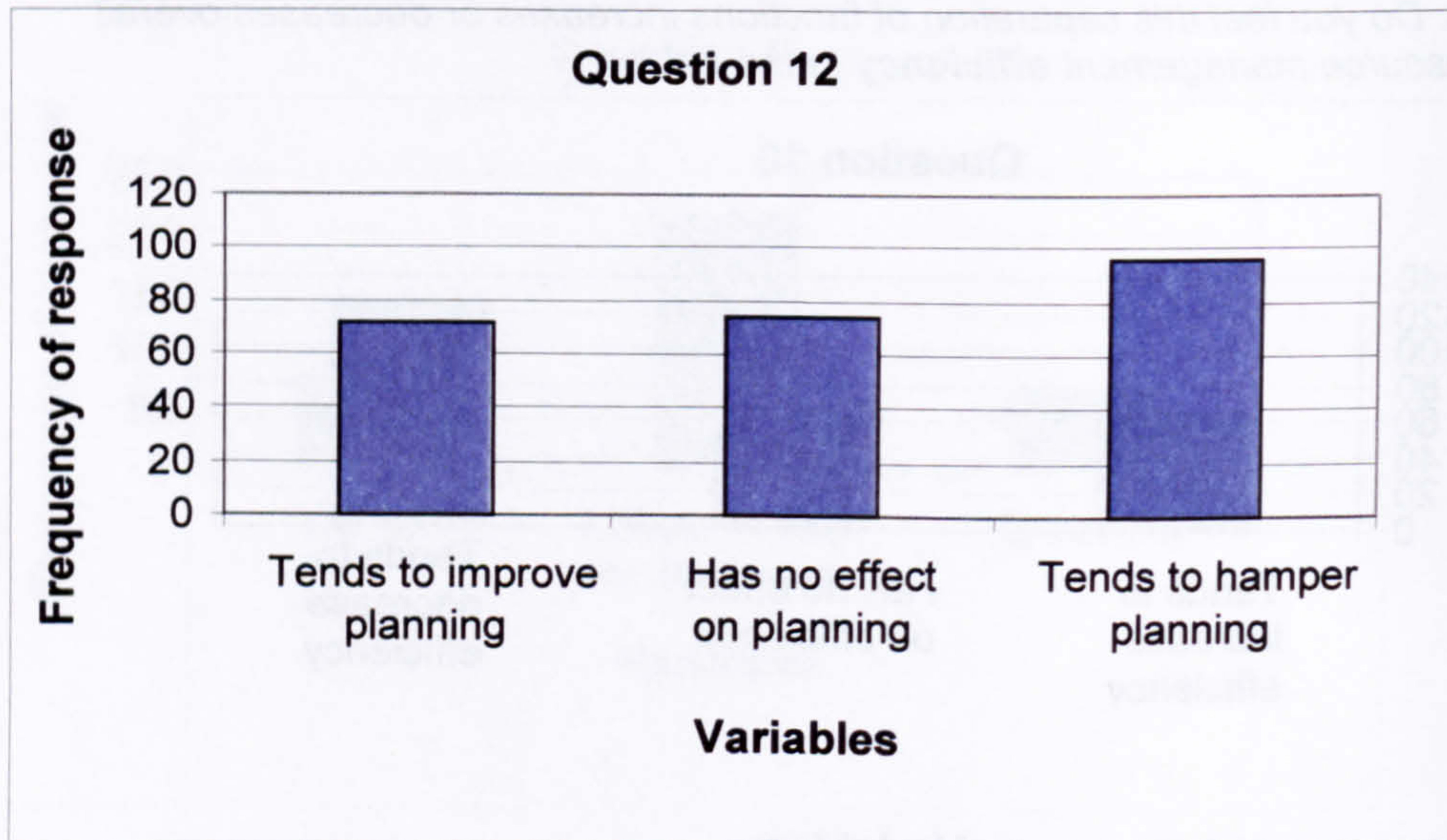


Figure 18 Graph to show the perceived impact of separate spheres of operation on water management planning capacity

Question 13: Can you think of any laws, regulations or policies that you would like to see enacted with regards to water resource management on a national level? They could cover anything you think may be of importance, from water pricing, management systems, pollution, water storage development, water transfers or water efficiency:

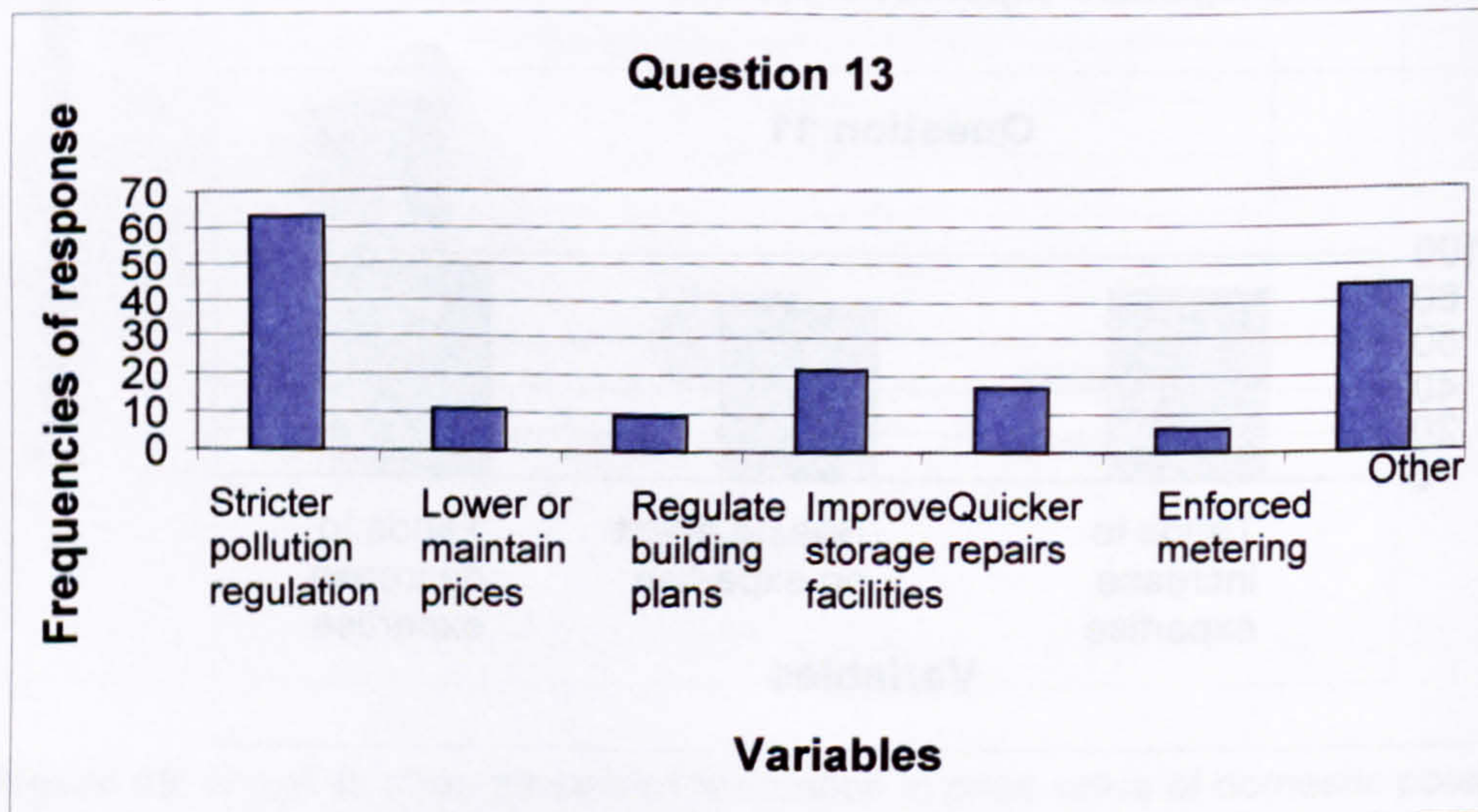


Figure 19: Graph to show respondent's self selected water policy options

Question 14: Many homes in the UK have been adversely affected by flooding events. What do you think is the cause or are the causes of flooding?

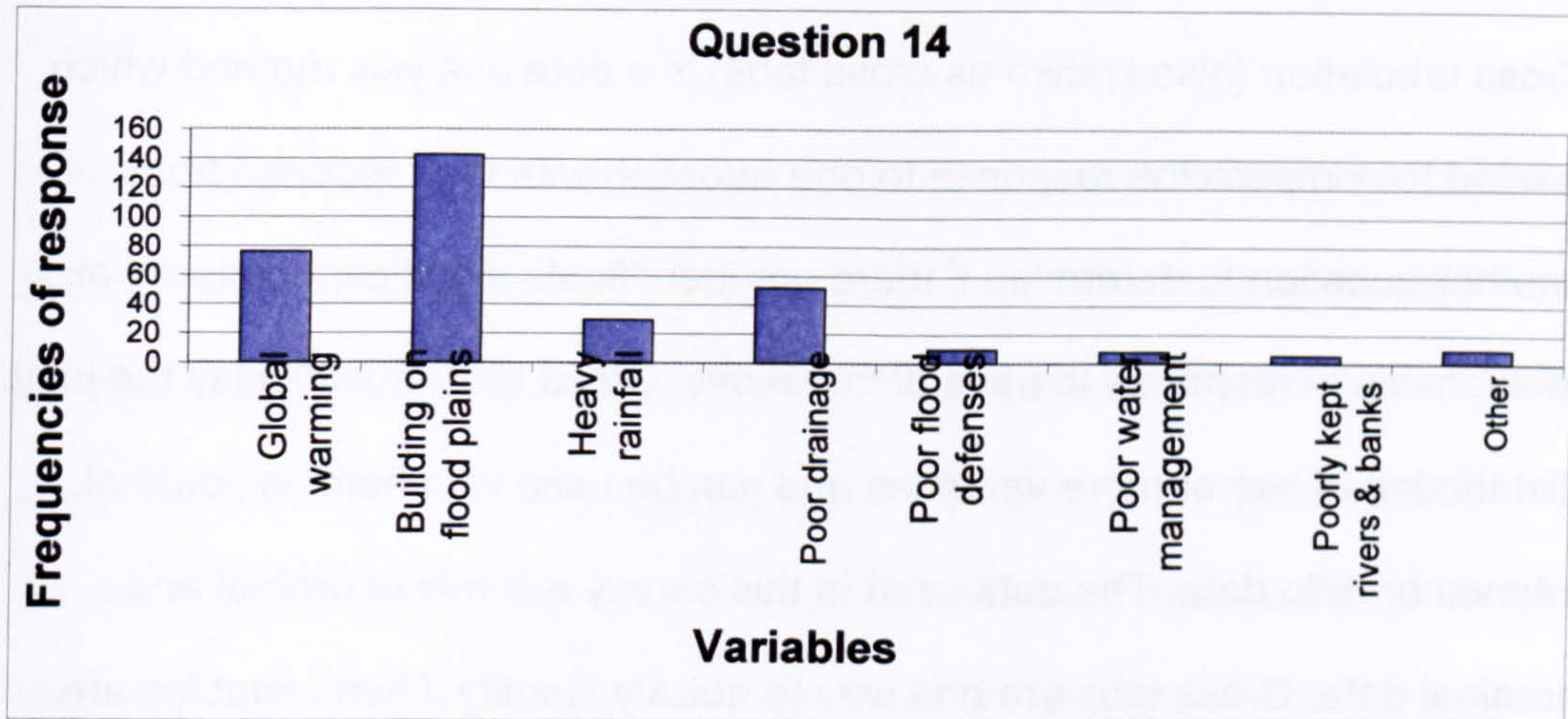


Figure 20: Graph to show perceived causes of flooding

Question 15: Whilst freshwater sources are finite, the UK population is steadily growing. Future forecasts indicate that although we have plenty of rainfall we may in time suffer water stress. In order to reduce water demand changes may have to be enforced. From the following list please indicate which **you** feel to be a legitimate policy change and which an illegitimate policy change in the context of growing water stress:

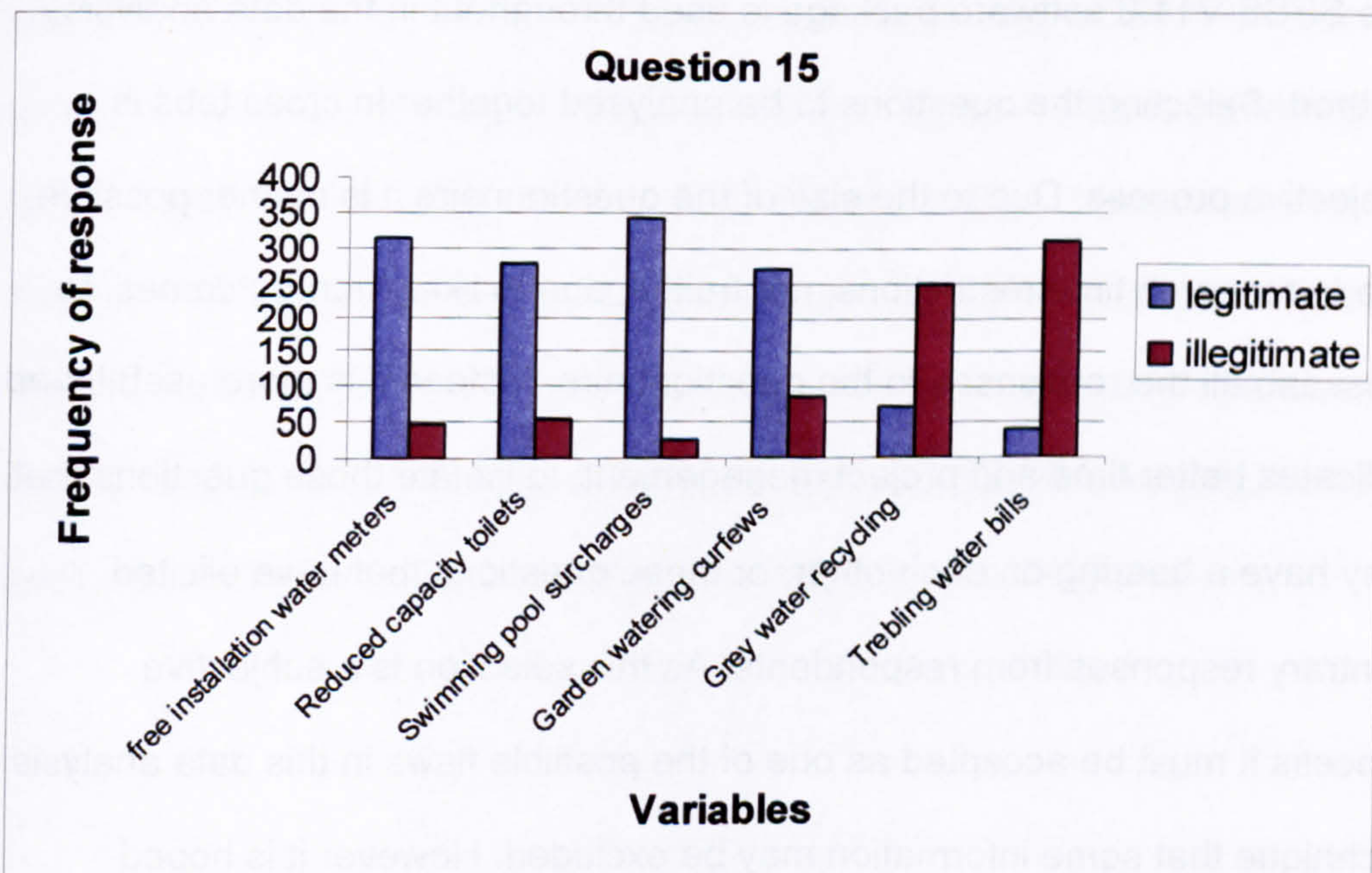


Figure 21: Graph to show the perceived legitimacy of various policy options which tackle water stress

Cross Tabulation

Cross tabulation (also known as cross tabs) is a data analysis method which is used to compare the response to one question with the response from another question to determine if there are identifiable significant patterns of relationship in response to pairs of questions. Cross tabs thus display the joint distribution of two or more variables and can be used with nominal, ordinal, interval or ratio data. The data used in this survey is a mix of ordinal and nominal data. Cross tabs are one way to quickly identify if two variables are statistically likely to have a bearing upon one another. In other words, cross tabs validate that any relationship is non-coincidental. This data analysis method presupposes both a large sample size and random results.

The SPSS V11.0 software package is used throughout in the data analysis method. Selecting the questions to be analysed together in cross tabs is a subjective process. Due to the size of the questionnaire it is neither possible, due to research time restrictions, nor fruitful, due to likely non-outcomes, to cross tab all the responses to the questionnaire. Instead it is more useful, and indicates better time and project management, to isolate those questions that may have a bearing on each other, or those questions that have elicited contrary responses from respondents. As this selection is a subjective process it must be accepted as one of the possible flaws in this data analysis technique that some information may be excluded. However it is hoped

through educated judgement that this risk is minimalised. A detailed analysis of the cross tab results will appear in the 'discussion' section of this chapter.

In order to clearly identify a strong relationship when undertaking cross tabs the chi-square test is applied. This assesses the probability that a relationship between two variables is co-incidental. Table 6 (below) lists all 76 cross tabs undertaken in this data analysis stage and highlights those where the chi-square test has found a significant i.e. non-coincidental relationship. This is indicated by a chi-square factor of 0.05 or below (and marked in red in the table). There is an underlying presumption that the variables are independent of each other. Those results that show that over 20% of the cells have a sample count of 5 or less and so are deemed outside of the valid range of inclusion and are marked 'cell count low' in the table. This is a standard practise figure to use. Given that the overall sample size is 390, it is clear that a count of 5 or less makes the result unreliable. Again, it should be highlighted that a 'significant' chi-square result does not infer any conclusions about the causal relationship between the variables used, but instead indicates that chance is not a factor of the relationship. As with all results, any conclusions drawn must be supported by the data and other contributory factors. All cross tabs and chi square results are available at any time for examination.

	Age Chi square	Gender Chi square	Property Chi square	Selective Question 1 Chi Square	Selective Question 2 Chi Square
Question 1 Urgency of water management	0.002 Significant	0.146	0.480	Perceived change in water environment 0.009 Significant	Trust in tap water quality 0.00 Significant
Question 2 Perceived change in water environment	0.119	0.123	0.952	Urgency of water management 0.009 Significant	
Question 3 Involved in water management	0.873	0.110	0.674	Involvement in community activities 0.001 Significant	Occupation 0.177
Question 4 Sector water use	0.112	0.00	0.188	Water as abundant 0.004 Significant	
Question 5 Trust in tap water quality	0.700	0.030 2x2 table Significant	0.796	Perception of water quality 0.00 low cell count	
Question 6 Informed re tap water	0.109	0.851	0.795	Trust in tap water quality 0.00 Significant	
Question 7 Quality of tap water	0.915	0.292	0.552	Urgency of water management 0.00 low cell count	
Question 8 Relative value of tap water	0.579	0.091	0.824	Changes in water pricing 0.003 Significant	
Question 9 Perception in changes in water pricing	0.311	0.892	0.950	Perceived change in water environment 0.00 Cell count low	Ownership of water meter 0.00 Significant
Question 10 Improves efficiency	0.140	0.916	0.798	Trust in tap water quality 0.001 Significant	
Question 11 Improves expertise	0.161	0.423	0.645	Trust in tap water quality 0.019 Significant	

	Age Chi square	Gender Chi square	Property Chi square	Selective Question 1 Chi Square	Selective Question 2 Chi Square
Question 12 Improves planning	0.469	0.851	0.833	Trust in tap water quality 0.009 Significant	
Question 13 Suggested policies and laws	0.628	0.426	0.229		
Question 14 Solutions to flooding	0.831	0.181	0.831		
Question 15a Legitimacy of enforced metering	0.342	0.611	0.029 Significant	Water meter ownership 0.035 Significant	
Question 15b Legitimacy of cistern size	0.365	0.680	0.851		
Question 15c Legitimacy of swimming pool surcharges	0.719	0.010 Significant	0.430		
Question 15d Legitimacy of watering curfews	0.40	0.610	0.833		
Question 15e Legitimacy of enforced grey water reuse	0.119	0.386	0.042 Significant		
Question 15f Legitimacy of trebling water prices	0.025 low cell count	0.946	0.242		

Table 6: Results of cross tabulations on selected household survey questions

The remainder of this section will analyse in more detail those cross tabs which show a significant relationship; some implications of these results are suggested.

5.12 Analysis of the research questions

Question 1

Age influences response. The majority of respondents of all age categories felt that IWRM was an issue to deal with in the 'coming years', starting at 40% for the 60 to 74 age group and rising to 80% in the 15 to 24 age group. In the 'no urgency' category ages 75 and above were most likely to treat it as a non urgent issue (37%) with the 46 to 59 age group the lowest respondents in this category (16%). In the 'urgently' category those in the 60 to 74 age range had the highest response at 33%, whilst the other age groups have a significantly lower response between 12% and 18%. No respondents in the 15 to 24 age group thought IWRM was an urgent issue. No clear pattern could be detected in the age profile then, with the majority of respondents content to wait until the 'coming years'.

When responses are cross tabbed with question 2 (changing quality of the water environment), 55.4% of overall response concluded that it is an issue for the 'coming years', indicating that it is a low priority issue. Unsurprisingly, those who felt the quality of the water environment had 'deteriorated' are more than twice as likely to denote IWRM as 'urgent' (at 36%) as those who felt environmental quality had 'stayed the same' or 'improved' (15%). Equally, those who felt that quality had 'improved' were twice as likely to say IWRM had 'no urgency' (32%) than was 'urgent' (15%). This shows there is no significant pattern of response between the two questions. Perceiving that the environment has degraded does not mean that a respondent is more likely to

signal that IWRM issues are urgent. This lack of association could illustrate that respondents may feel environmental degradation lies outside of IWRMs' remit of responsibility, or that IWRM cannot provide solutions to environmental degradation. This area could benefit from further investigation.

When question 1 was cross-tabbed with question 5 (tap water quality), the majority of all respondents said it was an issue for the 'coming years'. Those who trusted tap water quality (87% of the total sample) were almost twice as likely to respond to 'no urgency' (at 29%) rather than 'urgently' (16%). Those who did not trust tap water quality (13% of the total sample) were 4 times more likely to see it as urgent (37%) as non-urgent (9%). It is possible to appreciate that there is a relationship between trust in tap water quality and perceptions in the urgency of IWRM issues. However this is a weak relationship as the majority of all respondents feel neutral about IWRM.

Question 2

Cross tabbing responses question 1 (water management urgency), the results show that those who felt water management issues were 'urgent' were three times more likely (at 30%) to perceive a 'deterioration' in the quality of the water environment than were those who deemed issues 'non-urgent' (at 10%). Likewise 'non urgent' respondents differed from 'urgent' respondents by 10% in viewing an improvement in the local water environment.

These results appear to demonstrate that those respondents who are concerned with local water management issues will also be concerned about

the local water environment, so it is possible to identify a constituency who may be receptive to water conservation policies. This particular cross tab also reveals that the majority of all respondent types (with responses ranging from 58% to 69%) see no change in the local water environment. Given that during the past decade (1993 – 2003) the River Nene catchment has experienced both drought and flooding events, one can assume that these were not significant enough events along the whole catchment to stimulate either positive or negative reactions from respondents.

Question 3

A respondent's participation in community activities (question 9b – see Appendix 1) does not indicate a willingness to participate in IWRM. Of the total sample 13% participate in community activities – 87% do not. A respondent is four times more likely to say 'yes' to IWRM participation if s/he already engages in community activities (18% for the 'yes I would participate in IWRM' as opposed to 4% for the 'no I would not participate in IWRM'). Yet these percentages are low 18% of 13%: only 2.3% of the total sample. A respondent is still far more likely to say 'no' to IWRM even if s/he participates in community activities. Non participation in community activities increases the likelihood of saying 'no' to IWRM by 17% from 82% to 95.8%. Figures for both involvement in community activities and willingness to be involved in IWRM participation are both very low percentages of the total sample count.

Question 4

Cross tabbing with question 39 (see Appendix 1), those who 'agreed' or 'strongly agreed' that water was 'abundant' (22% of the total sample) also recognised that agriculture was the sector that consumed the most water (averaging 45% of response). Those who deemed water as 'abundant' gave the ranking in its correct national use order (Agriculture, households, industry, leisure). Respondents who felt water was not abundant (67% of the total sample) believed that industry was the main water using sector. Unfortunately, though an interesting response, it is difficult to draw any clear conclusions from this result.

Question 5

Responses show that female respondents are twice as likely to mistrust tap water quality (14% of women mistrust compared to 7% of men). Men trust tap water quality 7% more than women do. When comparing tap water trust with types of water drunk (question 25, Appendix 1), if a respondent mistrusts tap water quality s/he is most likely to drink bottled water (still) at 37% or filter tap water (31.1%). If a respondent trusts tap water s/he is most likely to drink tap water.

Question 6

Cross tabbed with question 7, those who 'trusted' their tap water quality were most likely to feel negative about information provision, with the highest response of all groups at 23% in the 'not kept informed at all' category. When

comparing tap water quality and where tap water is extracted from (question 12b – Appendix 1) there is no significant relationship revealed in the results. This indicates that quality is not associated with knowing its source.

Question 7

No significant results.

Question 8

Cross tabbing with question 9, those respondents who felt water prices had declined in the last ten years were more likely to view water as 'cheap' (at 35%) compared with those who felt prices had risen (18%). Conversely those who felt water prices had risen defined water as 'expensive' (at 24%), twice the response of those who felt water prices had 'declined' (at 12%). This indicates that the relative value of water is linked directly with its price.

Question 9

If one compares water price changes and ownership of water meters (question 33 – Appendix 1), those who have water meters in their property are three times more likely to feel that prices have 'gone up' rather than 'stayed the same'. However, non water meter owners are still more likely to feel prices have risen than water meter owners. This indicates that installation of water meters has no marked effect on how water users perceive relative price changes in household water bills. Given that water meters will record exactly how much water is being consumed in the household, one may infer that

people may associate a rise in prices with a rise in other household bills – even if their bills may actually decline as a result of water meter installation. As water meter research is outside of the thesis' objectives no further analysis will be undertaken though the data may be of use to other researchers.

Question 10

Cross tabs with question 5 indicate that of those respondents who stated they trusted tap water quality (88% of all respondents), 28.1% of them felt that efficiency is 'improved' by a separation of management functions whilst 43.8% felt it had 'declined'. Of those who 'did not trust' tap water quality (10% of the total response), 6.3% felt that efficiency 'improved' as opposed to 78.1% who felt efficiency had 'declined'. This is an interesting finding, indicating a lack of correspondence between trust in water quality and perceptions of water management efficiency. This may indicate that the standard of service provision, or even its perceived safety, does not accord with its ability to provide that service efficiently.

Question 11

When one looks again at responses provided by question 5 of those who trust in tap water quality (88% of the total response population) one sees that 33% feel that expertise 'decreases' with a separation of functions; this rises to 60% amongst those respondents who do not trust their tap water quality (10% of the total response population).

Question 12

Respondents trusting the quality of their tap water (question 5) see little impact of a separation of function of planning capabilities; whilst those who mistrust tap water quality feel function separation correlates with poor planning. Of those respondents who 'trust' tap water quality (88% of the total response) 30.3% felt that planning is improved whilst 36.5% felt that it is hampered. Yet of those who 'do not trust' tap water quality, 26.7% felt planning is improved whilst 63.3% feel that it is hampered.

Question 15 part a

Of all the property type categories bungalow owners at 94% feel that enforced free water meter installation is legitimate. A respondent is least likely to support it as a policy (a drop of 15% to 79%) if s/he is a terraced house owner.

Those respondents who already own a water meter (48% of the total response) are more inclined, by 7%, to believe it is legitimate to enforce free meter installation than those without a meter. Those without are more likely, also by 7%, to feel it is illegitimate.

Question 15 part c

Gender does appear to influence responses as women were 13% more likely to feel swimming pool surcharges are a legitimate policy than men whilst men were twice as likely as women to consider it an 'illegitimate' policy option.

Question 15 part e

A respondent is 17% more likely to view enforced grey water reuse as illegitimate if s/he lives in a terraced rather than a semi detached house (87% as opposed to 70%). Although this proposed policy is universally unpopular amongst householders, it does indicate a variance in receptivity.

5.13 Upper and lower catchment comparison

As the earlier Fenland empirical fieldwork (see Chapter 5) revealed a number of local concerns regarding water management issues, it was felt that the questionnaire results could be usefully employed to determine if there are significant differences in attitude along the different sections of the catchment. Table 7 highlights the organizational variation that geographical scale involves and which may shape how water policy is experienced at the catchment level. It was decided then to apply specific analysis to the 15 questions by comparing urban and rural responses and also responses from the top of the catchment, near the source of the river, with the bottom of the catchment where the river joins the sea. Responses from the top of the catchment come

from Daventry respondents and from the bottom from Wisbech respondents (see Figure 7).

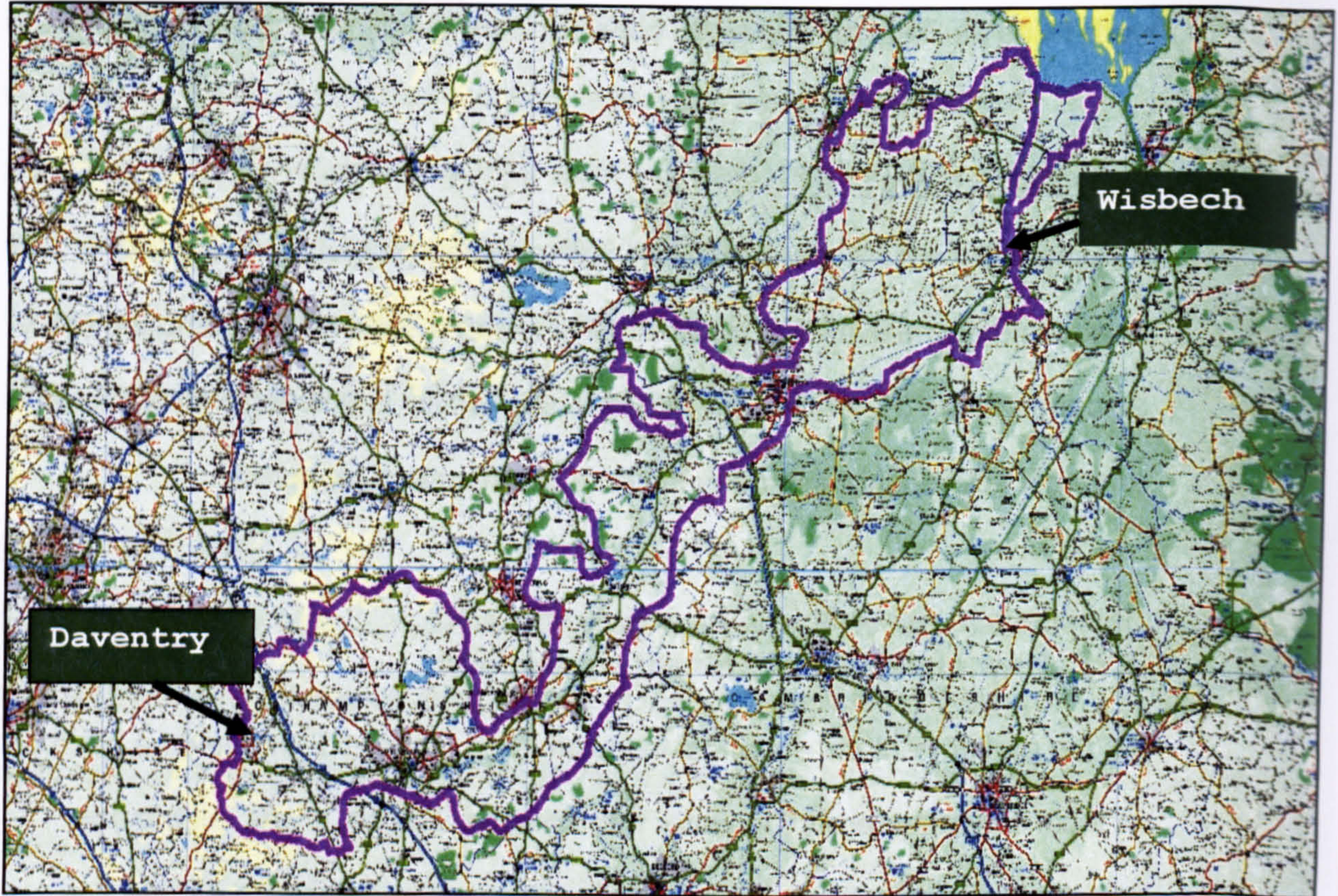


Figure 22: Location of Daventry and Wisbech on the River Nene catchment⁶³

Responses are provided in tabular form in Appendix 2, indicating percentages of response by each of the two geographical locations.

These two categories of analysis provide interesting comparative assessment options. By dividing responses by locality, it is possible to explore how the influence of physical location in different types of community may have a

⁶³ Source: NSRI, Cranfield University, personal communication.

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bearing on responses. Comparing upstream and downstream responses provides an insight into the diversity of opinions along the catchment.

Macro	Meso	Micro
<i>National</i>	<i>Regional</i>	<i>Local</i>
Government ministries e.g. DEFRA, ODPM	Water companies	MP surgeries
Regulators e.g. DWI	County Councils	Local & town councils
Large NGOs e.g. WWF	Regulators	Individual campaigners
Academic research	Regional NGOs, e.g. Water Voice eastern	Local NGOs e.g. Internal drainage boards
Lobby organizations e.g. WaterUK	Lobby organizations e.g. chamber of commerce	Lobby organisations e.g. local NFU branch
Private sector e.g. breweries	Private sector e.g. Foodfen	Private sector e.g. trading association
National media	Regional media	Local media

Table 7: Water governance bodies operating at different spatial scales within England and Wales

Finally, a focus on sub-catchment responses to the questionnaire may reveal different attitudes towards legitimacy issues than may be apparent from using standard variables such as age, gender and property type. The results of the sub-catchment analysis are presented in Appendix 2. The implication of the results are discussed in section 5.14.

5.14 Discussion

The results provide new insights into how household water users within one river catchment consume and value water.

The cross tab results show a low level correlation between both the three key variables of age, gender and property type and also the selected questions.

As a consequence no firm inferences can be drawn from these particular data analysis results. This indicates at the catchment level no dominant trend groups are exhibited.

High overall response to the questions shows that domestic customers are willing to be engaged in a wide range of topics including areas which are unfamiliar to them, such as water reuse technology and novel policy options.

A valuable way of contextualising the significance of these results is to refer back to both the five specific research questions and the five thesis research questions to see in what ways this piece of research has addressed the overall agenda of the research. This discussion section will aim to review how far each question has been illuminated by the household survey data and to reflect on what other pieces of research were needed to either validate the findings or fill in knowledge gaps. The discussion will again confine itself to the 15 questions analysed within the 'results' section.

Specific fieldwork questions (see Section 5.4)

- 1) What are the dominant perceptions that consumers hold with regards to current water provision in terms of service, value, quality, safety and reliability of supply?

This question was addressed by survey questions 6, 7, 8 and 9. The results show a high level of satisfaction regarding the quality and safety of water and its relative cost. Reliability was not specifically addressed as an issue. These results indicate that water provision is generally regarded as a non-contentious issue at the catchment scale.

- 2) Are consumers aware of any recent changes to their water environment (e.g. increasing water stress)? If so, is it possible to catalogue these changes e.g. in terms of rate of change, cause of change and effect of change?

This question was addressed by survey questions 1, 2, 4, 7 and 14. Only one of these questions was an open response specifically addressing flooding. The dominant concern, building on floodplains, is a factor controlled at the local planning level. This would seem to indicate that cause and effect is mainly viewed within a localised horizon. Generally though, response to closed questions indicates that there is no overriding or urgent concern and

respondents do not feel sufficiently motivated to involve themselves in water management discussions.

- 3) What range of possible future water policy options to ameliorate water stress are consumers willing to accept?

This question was addressed by survey questions 3, 13 and 15 a – f. Although consumers are not willing to participate in management fora, the results indicate a willingness to engage with a diversity of policy options. These are both suggested and self formulated. Responses indicate that consumers are willing to trial quite radical policy innovations to reduce water demand. This would indicate that consumers appreciate the multiple demands placed on water governance institutions and are, in theory, receptive to exploring a variety of water saving options. There is however, a clear cut-off point when measures are too extreme, namely grey water recycling and radical price hikes. This former option could be interpreted as a mistrust of water reuse technology; the data set does not reveal if this is due to its unfamiliarity, practical issues such as lack of space or cultural issues connected with potable quality for all household activities.

- 4) Post privatisation of the sector; do consumers view water governance bodies as a coherent set of institutions?

This question was addressed by survey questions 10, 11 and 12. Catchment scale feedback indicates that management capability presented in terms of efficiency, expertise and planning tend to be viewed as having marginally deteriorated since privatisation. This was the historical point at which regulatory functions were clearly separated into specific institutions. Given earlier results which show generally high customer satisfaction in service provision, there is no data within this survey to explain this response set.

- 5) Is it possible to discern the existing nature of legitimacy relationships between water users and governance bodies through isolating contributory issues such as trust, communication, institutional longevity, and policy innovation?

This question was addressed by survey questions 2, 3, 5, 6, 10, 11, 12, 15 and 15 a-f. Specific research questions 1 and 4 indicate a conflicting response to issues of service provision and satisfaction with post-privatisation management capabilities. This would indicate that survey response alone does not provide the thesis with sufficient detail to make definite conclusions about the nature of legitimacy relationships, as institutions can still have high output legitimacy even if viewed as not optimising on their management capability. We can say then that aspects which aid the building of legitimacy relationships, such as trust and communication play an important part in confidence building, but this is conferring legitimacy on governance

institutions only. These survey results do not indicate in what ways consumers view each other as having a legitimacy stake within IWRM.

This data set can also be usefully analysed with respect to the overarching research questions of the thesis and are detailed below in the next section.

Thesis research questions

Research Questions
1. What are the different needs and expectations of water users and governance bodies in relation to their existing use of the River Nene catchment?
2. Is legitimacy present or absent in current relationships between water users and governance bodies along the River Nene corridor?
3. Can strengthening legitimacy enable a broadening in response envelopes to allow for more adaptive policy tools to cope with water stress?
4. What policy options to combat water stress are water users and governance bodies willing to consider?
5. Are the institutions, organisations, agencies and bodies responsible for the governance of water resources and water services in the River Nene catchment potentially adaptive to water stress?

Research Question 1: *What are the different needs and expectations of water users and governance bodies in relation to their existing use of the River Nene catchment?*

The response to this question is limited by the data which focuses solely on water users (and is the case for all of the research questions in this discussion section).

It is evident from the data that there is a high level of overall satisfaction with the current water management regime service within the catchment. This is inferred from responses to questions 1, 2, 3, 5, 6, 7 and 8. These questions either show neutral responses or positive responses regarding issues of service standards, service cost and quality and local water environment issues. It is possible to infer from the high level of neutral response that expectations have remained static over the past 10 years. This would indicate that water issues are not high on household respondent's list of primary worries or concerns. As these are closed questions it is not likely that the research can infer any suppositions concerning respondent's needs.

Looking at the sub-catchment analysis (Appendix 2) it is clear that downstream respondents have a different set of concerns than upstream respondents.

Research Question 2: *Is legitimacy present or absent in current relationships between water users and governance bodies along the River Nene corridor?*

As detailed in Chapter 3 and explored somewhat in Chapter 6, legitimacy's presence can be marked through an absence of any perceived crisis. What has not been explored, but is worth pursuing, is the link between trust and legitimacy. There is a wealth of literature which explores the role of trust in society (see Sabel, 2002; Giddens, 1990; Barker, 1990). Although this literature enriches the exploration of legitimacy within this thesis it also detracts from a specific analysis of how legitimacy functions as a political concept. Rather than take a theoretical detour, this question, in the context of household users, is a good place within the thesis to think around the link between trust and legitimacy.

It is possible to identify trust in this survey context as the willingness to rely on an institution's ability to provide a reliable standard of service. Citizens rely on institutions to provide accurate information on which they can form judgements and opinions. Citizens reduce their exposure to risk by trusting those state and public sector institutions on which they depend. Trust, therefore is a contributory factor which helps build or cement legitimacy.

Looking at the results of question 3, one interpretation could lead one to surmise that there is a strong relationship of legitimacy between water users and governance bodies (note, it is not possible to infer how governance

bodies feel towards water users). One can surmise this by the strength of water users' desires not to be involved in discussions and debates concerning water management. If respondents felt mistrust of the governance bodies it is likely that this 'no' response rate would be significantly lower. Comparing the results of question 3 with results from questions 1, 2 and 5 we can say that no high incidence of mistrust is apparent.

Question 5 clearly indicates high levels of trust in the product (water) supplied by the governance bodies. Comparing this result with question 6 (perceived tap water quality) we see that the provision of reliable information merits lower levels of security, with a higher incidence of neutral or even negative responses. This indicates that citizens can distinguish between the product and the service. This is supported by question 7's response which confirms that most respondent's feel that their water is of a good quality – even if information concerning water quality is absent. Question 5's results tally with question 7's results in profile of response. Trust in product and trust in service are obviously viewed in two different ways; and a lack of trust in service does not necessarily infer a lack of trust in the product.

Moving on to questions 10, 11 and 12 dealing with particular aspects of service, namely efficiency, expertise and planning capacity, we see a markedly different set of responses. The frequency graphs for each show that the majority of response in each category shows a negative response. The objective of these questions was to ascertain if the separation of functions in

water resource management, which was instigated by the privatisation process, was perceived to be successful in key management areas. These three results show that the public are not satisfied by these management changes. Yet this does not appear to have had an impact on the perception of the product delivery. We can infer then that water users are able to separate trust into different aspects of an institution's remit. Again the results of 10, 11 and 12 show that levels of mistrust are not high.

The only question which specifically deals with legitimacy is question 15. These results show that respondents are willing to accept quite radical policy proposals in order to reduce the impacts of water stress. The high response rate shows that respondents do not have a problem with the concept of water stress nor with the change in cultural use of water that water stress may bring. This in itself is surprising given that question 4 shows that most people feel that industry uses the most water; it could be presumed that question 15 would reflect those findings and that a greater proportion of household policy would be viewed as 'illegitimate'. The high response rate also highlights that water users do not find the terms 'legitimate' or 'illegitimate' problematic. Only with grey water recycling and trebling of water prices do we find a rejection of legitimate policy options. Grey water's unfamiliarity will have an impact; responses from this question section (see Section 7, Appendix 1) show that concerns with cost of maintenance, bulkiness and odour problems are all deterrents to the uptake of this technology by householders. Returning to questions 8 and 9, we can see that there is a general perception that though

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water is not an expensive household utility its cost is rising; this undoubtedly impacts on the willingness to accept sharp rises in price.

Research Question 3: *Can strengthening legitimacy enable a broadening in response envelopes to allow for more adaptive policy tools to cope with water stress?*

The discussion undertaken in response to Research Question 2 can equally apply here. Having noted different perceptions to issues of service and product, it is possible to argue that the results show a neutral attitude towards governance bodies; there are no responses which indicate mass dissatisfaction. The sub-catchment analysis (Appendix 2) does reveal location specific dissatisfaction. Returning to question 15, the results indicate that householders appear to accept quite radical policy innovations to counter water stress. Of course the theory of some of the options may not be so palatable in real life; the Sydney water company has had day-time garden watering restrictions in place since 2001. Although complied with they are seen as unpopular (www.smh.com.au). Yet the questionnaire results do indicate that satisfaction with governance bodies may provide more flexibility to policy innovations.

Research Question 4: What policy options to combat water stress are water users and governance bodies willing to consider?

As stated above, this question can only be addressed from the water users' perspective. As detailed throughout this chapter, the results show that domestic users are willing to be flexible with monitoring their water consumption (through the installation of water meters); by retrofitting water saving devices (such as smaller capacity toilet cisterns); by selectively taxing household swimming pool owners and by limiting when they can water their gardens. This last policy option response in particular is surprising given that most past research has shown that garden watering is an issue that is highly provocative, as people are unwilling to compromise their outdoor activities to save water.

The policy options rejected by respondents focused on grey water technology and extreme price rises. These options are vastly different. Grey water technology is a developing field and does not have much available data available concerning domestic receptivity. Responses to question 42c (Appendix 1) reveal that issues of odour, maintenance, size and safety are all concerns connected with this technology. Developing grey water technology as a policy option may be a case of education, or more exposure to this water reuse system within eco-housing.

Water pricing has its own field of literature which will not be discussed here (see Winpenny, 1994; Zhou et al, 2000; El Fadel et al, 2001). Water and willingness to pay issues have also generated much discussion when looking at water demand management policy options (Lawson, 2002). What the survey response does show is that householders along the River Nene are willing to consider other policy options before they accept price rises. Future research could benefit from exploring these policy options in more detail.

Research Question 5: *Are the institutions, organisations, agencies and bodies responsible for the governance of water resources and water services in the River Nene catchment potentially adaptive to water stress?*

This question was not addressed by this piece of research. In order for the thesis to understand potential adaptivity it is clear that empirical research needs to be undertaken which specifically explores potential adaptivity to water stress. This fieldwork activity is detailed in Chapter 7.

5.15 Conclusion

Six key conclusions can be drawn.

1. The consistently high level of overall response to this study by domestic consumers reveals that people are willing to be engaged in water resource management issues. Moreover, the varied response to a mixture of open and closed response questions highlights that there are a range of current water

resource issues with which consumers are concerned. The study results suggest that the public's willingness to engage with such issues provides public participation initiatives with the certain knowledge that receptivity does exist. In particular, the questions which engaged with the legitimacy or illegitimacy of possible future policies generated a high level of engagement with consumers, suggesting that this is both a concern and an access point for involving people with public participation exercises.

This suggests that whilst legitimacy does not rank as a high profile concept that is prominent on any public agenda, it is a key element for the acceptance of water management within the catchment. This leads to a re-consideration or re-valuation of the role that legitimacy plays in the 'making things happen' schema of relations between civil society and the state, and raises a concern with deliberative democracy.

Returning to the literature review within Chapter 2, the research can now identify a further knowledge gap – that of how legitimacy operates between these two spheres of civil society and the state. Further, the methodology adopted in this chapter prompts a reconsideration of the conceptual principles which underpin the assumptions outlined in the opening three chapters.

Chapter 6 provides this opportunity by reviewing the assumptions concerning the deployment of legitimacy within modern polities and attempts to develop a new conceptual model that might explain more thoroughly the evidence delivered by the empirical fieldwork.

2. Respondents were able to isolate six areas relating to water governance that they feel should be addressed: pollution control; lowering prices; protecting flood plains; improving storage facilities, improving repairs and maintenance and, finally, introducing enforced metering. There is a great difference in emphasis the upstream and downstream locations. For policy makers this presents a challenge. Although there is consensus about the issues of concern, there is no consensus concerning the appropriate emphasis each policy should be given.

3. The multiple responses generated by the 'causes of flooding' question reveal that respondents are able to easily discern the contributory factors that they feel exacerbate the risk of flooding. Responses show that combinations of these contributory factors vary. In relation to policy development, it is clear that location at the sub-catchment level significantly alters perceptions of causation. Although all respondents cited building development on flood plains as the main factor, all other contributory factors change in significance; policy makers must be receptive to this when developing catchment flood defence plans so they can utilise local knowledge and experience.

4. The upper and lower catchment locations show considerable differences when considering the separation of functions in water resource management. Respondents in the lower part of the catchment show a much higher satisfaction level with expertise, efficiency and planning performance in the

post privatisation mode of water resource management than respondents in the upper section of the River Nene. Two factors appear to be significant: trust in water quality and the location of the respondent. Throughout the catchment mistrust in water quality results in a tendency to view management performance in all three areas, efficiency, expertise and management, as declining. Location has a significant effect, with upstream residents much more likely to view all management criteria as poorly performing. These responses demonstrate that not only does service perception in one sector have a knock-on effect in another, but that this perception can also be geographically specific. Not only do governance bodies need to get practice right, but they must ensure that service is tailored to the needs and expectations of particular sub-sections of the catchment.

Policy makers may find explanations for this response in the types of relationships that exist between water governance organisations and the public in different sections of the catchment.

5. Similar response profiles across all sub-catchment levels can be found at the basin scale. All along the catchment enforced metering, smaller toilet cistern size, surcharges for private swimming pool owners and garden watering curfews were all supported as legitimate policy proposals. However, enforced grey water system installation and trebling of domestic water prices were all rejected as legitimate policy initiatives. Again, it is necessary to be careful of generalising at the catchment level.

6. The low correlation of responses to pairs of questions, illustrated through undertaking cross-tab analysis, shows that respondents cannot be easily grouped into types e.g. a predisposition to show concerns for the water environment does not mean that respondents automatically perceive water management issues to be urgent. In other words respondents in this survey have not constructed a simple 'cause and effect' view of the world. In terms of adaptation to water stress this may mean that policy makers will need to construct much more sophisticated messages to accompany policy instruments: simply slotting people into target groups will not capture the complex opinions of real life actors.

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Chapter Six: Identifying legitimacy; the development of a concept of ‘legitimacy dialogues’.

6.1 Introduction

This chapter returns to the central ambition of the thesis; to examine the role of legitimacy in the relationships between water users and governance bodies. The chapter will be organised in the following way. Section 6.2 will examine the way in which legitimacy has become visible as a phenomenon of study, and develops an understanding of legitimacy as embedded within a network of relationships that link together diverse institutions and actors. To develop this sense of legitimacy as a network, the chapter will look at the notion of governance.

The chapter then moves on to ask how we can build up social legitimacy⁶⁴ by strengthening input and output legitimacy. One way in which this could be done is through increased participation, communication and consultation between the agencies and actors involved in the consumption and management of water. The need to explore these issues feeds directly into the fieldwork results detailed in Chapter 5. This leads the research to focus in this chapter on the notion of dialogue as a concept which helps articulate the operation of legitimacy. The chapter concludes by developing a model of

⁶⁴ See Chapter 1.

'legitimacy dialogues' and formulating a strategy to test this model within the ultimate fieldwork exercise detailed in Chapter 7.

6.2 Legitimacy and governance

How does legitimacy become 'visible'? How is it possible to study the phenomenon? One influential approach would suggest that legitimacy only becomes apparent when there is a crisis in state-society relationships (Habermas, 1984, 1987). It is thus possible to speak of a 'legitimacy gap' (Habermas, 1976). Whilst this idea cannot be dismissed, the focus of this work is somewhat different. A legitimacy gap will be understood as a failure to provide or rather harness input and/or output legitimacy. If a process, person or policy is viewed as socially legitimate (Schelling, 1960), then there is likely to be a higher value placed on input legitimacy; an absence of social legitimacy may also compromise or dilute possible option spaces⁶⁵ for output legitimacy.

When formal processes attempt to demand validation without recognisable achievement then there is a gap between formal authority and popular support. The fieldwork undertaken by the thesis in Chapter 5 indicates that there is regulatory 'patchiness' along the catchment between water users'

⁶⁵ 'Option spaces' refers to the conceptual area that decision makers operate within. Often the actual option space does not map directly onto the perceived option space of the decision maker. Option spaces are also malleable. Policy goals can be achieved both by widening option spaces and by changing conceptual spaces to match.

perception of service provision and critical appraisal of water management efficiency, expertise and planning capacity. Determining strategies to narrow or eradicate these perceived gaps could play a significant role in shaping the boundaries and opportunity spaces for policy tool development within the context of adaptive water management.

This leads to a second point. We need to understand that legitimacy is embedded in networks that link together informal and formal modes of legitimacy. If legitimacy is operational, and if it can play a role in both developing and deploying adaptive policies to ameliorate water stress, how is it possible to access the channels through which legitimacy is strengthened? If it is not possible to identify these concerns, policy formation remains an expensive and time consuming process of trial, error and reformulation.

The argument will be developed by referring back to the fieldwork described in the previous chapter. It is clear both from the Fens scoping review and the household questionnaires that water users can be engaged with water resource issues. Moreover, the scoping study and questionnaire highlight that this engagement with water resource issues, even in the context of it being a low priority concern, reveal that water users have clear positions on certain subject areas such as quality, pricing, involvement in decision making and types of policy option. What is not fully understood from the scoping study and the questionnaire is how to access the process or arena in which opinions are formed concerning what makes a right or legitimate policy, institution or

decision. Being able to more closely target what water users and governance bodies consider 'legitimate' may help to develop policy strategies that are acceptable to both and that provide for adaptivity in light of water stress. The scoping study and questionnaire empirically show that legitimacy is important, but they do not reveal the elements that determine what mix will make a person, process or activity seem legitimate. We need then to think more about how people or institutions articulate legitimacy. One way of doing this is to reconceptualise legitimacy as operating within a network of formal and informal networks. Legitimacy then exists as part of the dynamic of relationships and can wax and wane; it also is dependent on communication.

As argued in Chapter 2, legitimacy has to be understood as a form of dialogue. To understand legitimacy as dialogue, it is necessary to return in more detail to the concept of governance (see Chapter 2). This concept has already been used in Chapter 1 to describe management and stewardship relationships in the River Nene corridor. The term governance also has a more technical definition in political theory,⁶⁶ where it describes how power can be seen as sited within a de-centred network of institutions. Governance conceived as a network of institutions suggests a more useful means to describe legitimacy, as it moves away from the model of legitimacy as a concept linked to a justification of the central state or formal actors. Indeed, thinking in terms of governance networks suggests that legitimacy operates at

⁶⁶ This technical definition is congruent with the use of the term in this thesis. Governance both describes specific stewardship roles and, at a more general level, the networks in which these bodies operate in networks that bring together formal and informal actors.

a grassroots level, fostering relationships of trust, credibility and reliability between actors and institutions of different status. Legitimacy is, in other words, fundamental to relationships of governance. After elaborating this broader theory of governance, this chapter will show in more detail how governance can be linked to legitimacy dialogues.

It is necessary, first of all, to distinguish between government and governance. Government describes the activities of the sovereign state and can be linked with the idea of formal legitimacy. Governance, on the other hand, moves away from a legal model, or indeed a model of sovereignty.⁶⁷ To elaborate further, there is one model of authority, which concerns itself with the relationship between the executive and the judiciary, and there is another, that is not so rigidly located. This expression of authority is bound up with the creation of networks which link together different actors operating in both formal and informal governance spheres.

This central point can be made more succinctly. To understand the modern phenomenon of legitimacy in water management, it is necessary to accept that this is a field where diverse agencies operate. This can, at one level, be related back to the development of discourse around water and public health that developed in the last century. This effectively creates the 'space' where

⁶⁷ Governance is not to be confused with Foucault's concept of governmentality (1979). Governmentality is an expression of a mode of power that seeks to organise and control all aspects of civil society. This control extends beyond state apparatus to include powerful expert discourses that recommend how subjects think and act.

different agencies and individuals with different areas of competence and expertise come together to define and manage public welfare. In other words, it would be too restrictive to describe this political space as one occupied entirely by the state and state agencies.

To further expand this point, the contemporary state in the United Kingdom has changed dramatically from the 'small' state of the late eighteenth and early nineteenth centuries. The reasons for this change are complex, but would include the diverse tasks of economic and social management that the state has taken on. The modern state relies on delegation of authority, and on a reliance on regulatory bodies. Although these derive their power from statute, they operate largely within wide powers of discretion. It has been shown in Chapter 4 how the recent history of the water sector has changed the provision and management of the resource. The central question becomes: how can legitimacy be conceptualised within this political framework? How can decisions be seen as authoritative and justified? How can a de-centred state interface with a diverse collection of users groups or consumers, pressure groups, regulatory and policy making bodies? How can we think of a process that produces legitimate policy decisions?

There is another central issue that it is necessary to address. One of the central questions asked by this thesis is that of the legitimacy of change. In conditions of increasing water stress, there is a pressing need for adaptation and change within government and the water industry. If change is necessary,

how is it possible to talk of isolating and 'strengthening' the role played by legitimacy so that transformations are accepted by water users and governance bodies?

Whilst adaptive responses to water stress will be self evident in some areas, (for example greater water efficiency use in the home and the use of water hardy crops in agriculture) it is the longer term impacts on society that legitimacy will need to support. There must be a general perception by water users that changes are legitimate. If there is a failure of legitimacy, the consequences are likely to be serious. Water stress may well affect future food security, economic security, and international trade relations; it could dictate patterns of employment and quality of life. More generally, increasing water stress would undoubtedly raise further moral and ethical questions as to how we balance, replace, or abandon, individual freedoms and community approaches to living. Addressing the structural shifts that developed societies will need to undertake is not something that can be undertaken by one sector, or one term of government. As Hay (1994, p.224) reflects:

“The painful reality of exponential environmental degradation necessitates far more than the 'greening' of lifestyle identities and consumer choice. Instead, what is required is a much more deep seated transformation of the context within which such choices are exercised.”

Hay goes onto argue that any form of successful social restructuring rests upon the degree to which public perceptions of what is desirable can

themselves be changed. The risk is that such a change in perception could only come about through a fundamental political crisis. This thesis suggests that such an extreme view is not licensed; at least as far as change in water management is concerned. Studying legitimacy suggests that it may be possible to build on existing relationships of trust to achieve more radical policy ends.

These are, of course, complex problems. The enhancement of adaptive capacity involves multilayered and multi-temporal policy tool development that may involve coercive, remunerative and pliable policies. As adaptive capacity necessarily involves sectoral shifts, the meta problem is one of co-ordinating these changes. Although we can see that some policy change mechanisms can change behaviour and attitudes in certain key areas, whether the state itself has the capacity to provide an integrated response to such wide ranging questions is another matter.

Deepening structures, processes and systems of legitimacy requires planners and policy makers to recognise both formal modes of legitimacy and the informal networks through which ideas and practises are negotiated. It may be difficult to co-ordinate the different expectations, operations and actors that will need to be factored in to an adaptive capacity framework. The landscape of legitimacy will likely take longer to reconfigure than that of policy mechanisms. The threat is that legitimacy may lag so far behind mechanism

change as to severely compromise the effectiveness of selected policy options.

Where does this leave us? Clearly from this perspective strengthening legitimacy is a precursor to policy deployment. It might even be hazarded that strengthening legitimacy relationships may determine the shape of policy. One way of achieving this is through a close examination of the part that dialogue formation has played in shaping modern governance techniques.

6.3 The role of dialogue

Dialogue can be seen as the process of interaction, debate, argumentation and comprehension; although not necessarily involving agreement or resolution. Dialogue can be viewed as processional and iterative and plays a fundamental part in enabling communication between groups and within groups. As Bohm et al stated in 1997:

“Dialogue, as we are choosing to use the word, is a way of exploring the roots of the many crises that face humanity today. It enables inquiry into, and understanding of, the sorts of processes that fragment and interface with real communication between individuals, nations and even different parts of the same organisation.”

Dialogue therefore plays an essential part in trying to promote both ones own perspective and understand that of others. Dialogue is increasingly seen as

an essential aspect of building public participation in policy initiatives. An example is Article 14 of the Water Framework Directive that seeks to increase public participation in river basin management plans. Another approach has focused on developing deliberative democracy through the exercise of dialogue (Matthews, 1994). Several initiatives have been championed utilising this approach including the River Dialogue launched in 2003 (www.riverdialogue.org).

The results from the Fens scoping study and the domestic water user questionnaire lead to a need to re-evaluate how water users and governance bodies communicate with each other and develop relationships grounded in legitimacy. This leads to a series of unanswered questions. What part do dialogues play in legitimacy building? How do actors and institutions construct dialogues to support ideas that legitimate or delegitimize policy? Are dialogues used to support or negate different views – or both? Does this make dialogue essential to legitimacy building or simply one element of it? Do actors and institutions use conflicting dialogues to support their position? If it is possible to see legitimacy as the connection and interface between the 'lifeworld' of civil society and the 'system' of the state, then developing a model to identify the presence of dialogic interaction is crucial (Habermas, 1976). One way of approaching these issues, through the development of a 'legitimacy dialogues' model, is outlined in the following section.

6.4 The formulation of the legitimacy dialogues model

A two month study trip to the Council of Scientific and Industrial Research (CSIR) in South Africa during 2003, led to a reflection upon how a society undergoing massive transformation in all its key sectors is managing to successfully realign itself. The inference here is that South Africa represents a possible role model for the transformative and adaptive capability that developed countries may need to harness to develop strategies that ameliorate water stress. Reflecting on processes of change in South Africa led to the development of the legitimacy dialogues model (see Figure 23).

The model took as its starting point the question 'how did the South African state and its civil society articulate the need for change?' By using the South African Constitution (1996) as a template and reviewing media reports, academic papers and new national laws, a conceptual model was developed. The model reflects that in South Africa a need for change was presented and argued in four ways; by using dialogues that refer to the past; those that imagine an alternative future; those that address the concerns of interest based groups and those that address the concerns of issue based groups.

The refined model (Figure 8) shows that these dialogues are not always positively presented; that negative dialogues, or rather those that problematise or compound a concern, are just as influential with regards to legitimating a person, institution or perspective. The model is not exhaustive

nor comprehensive, rather it is a 'work in progress' that needs to be refined in light of its proven conceptual and empirical robustness.

The aim of the model, as stated above, is to better understand how legitimacy interfaces between civil society and the state. In modern democracies the electorate has to be convinced of the rightness of change in a manner that also protects state longevity. So legitimacy can involve persuasion, conviction and subtle coercion. The model seeks to explain how these different methods inculcate change and transformation in modern society. Yet the model is incomplete unless we can picture how these methods are implemented. The selection of the term 'dialogue' is used here to explore what narratives, opinions, decisions and conversations allow change to be negotiated between different actors and institutions.

Inherent in the term dialogue is the notion of two or more voices entering into communication. Dialogues are therefore dynamic – they involve subjects within a process of interaction.⁶⁸ No reference is made in the model to the power relations, and the tendency towards asymmetry when dealing with state-society relations. This is deliberate as there is a tacit implication in the model that the power dynamic will shift according to where, when and who is

⁶⁸ Conversely a monologue is a one way flow of ideas, opinions, thoughts or edicts and is static – one can only respond to the monologue, not enter into it. A monologue may trigger transformation, unilateral statements such as a declaration of war or interest rate cuts are examples of this. Monologues may produce change. Authoritarian societies could be characterised as ruled through monologue. Dictatorships thus lack, at least at an official level, the interaction of voices and opinions that are necessary for the democratic legitimisation of policy.

involved in any particular dialogue. This interpretation allows the legitimacy dialogues model to be viewed as inherently flexible and dynamic.

The legitimacy dialogues model is useful to the thesis as a means to explore the way in which change is negotiated, enforced, accepted and challenged by water users and governance bodies. Through asking where, how and why legitimacy dialogues appear we can begin to map an evolution of processes that create change – and those which may hamper or block change. Looking at types of dialogue within a discourse it is possible to start to see how ideas, individuals and policies form, how they are affected and how they develop. These dialogues can have different disciplinary roots, can be conflictual, and can overlap and provoke new areas for exploration. They evolve into legitimacy dialogues when they are deployed to attain a certain end – to convince, to enact and to mitigate change.

One question that needs to be posed is the relationship between legitimacy dialogues and techniques of governance.⁶⁹ Legitimacy dialogues are seen, in a governance sense, as a series of different, sometimes interrelated pathways which reveal the issues, the people, the positions and the politics of change. Legitimacy dialogues are, in other words, the public, policy and political discourses which enable change and are crucial to our understanding of the evolution of water management systems.

⁶⁹ Wilson (2003, p164) notes that whilst dialogue involves interaction between groups representing different views, how far this transforms itself from benign participation to exerting decision making influence is not always clear; as he notes: 'multi-level governance and multi-level participation are not identical'.

Legitimacy dialogues which....		
Pair 1	Associate with the past	Disassociate from the past
Pair 2	Create or compound constituencies of interest	Dissolve or problematise Constituencies of interest
Pair 3	Create or compound constituencies of issue	Dissolve or problematise constituencies of issue
Pair 4	Move towards a known future	Move towards an uncertain future

Figure 23: The legitimacy dialogues model

The notion of dialogue provides this thesis with a means to analyse how routes of communication between social institutions (people, processes, practises) have been created.⁷⁰ Thinking around how these dialogues have been blocked, opened, narrowed or redirected, it is possible to refine the four legitimacy dialogue types developed above to posit four distinct pairs (see Figure 23).

These pairs are: dialogues which associate with or disassociate from the past; dialogues which create or compound constituencies of interest or conversely dissolve or problematise constituencies of interest; dialogues which create or compound constituencies of issue or again dissolve or problematise

⁷⁰ Habermas' notion of 'communicative action' (Habermas, 1984, 1987) has also been useful as a heuristic device to allow the creation of a typology of dialogues.

constituencies of issue and finally dialogues which move either towards a known future or, finally, those which move towards an ambiguous or unknown future. Each dialogue type will be explored in more detail before being applied to the fieldwork data, generated by the Fens scoping review, to test for their relevance and robustness. This theoretical exploration of each paired dialogue provides the thesis with a grounding from which to contextualise the results of the already completed fieldwork and the possible implication of these results for the research objectives.

Pair 1: Legitimacy dialogues which associate and disassociate from the past

A truism of politics is that in modern democracies political parties increasingly define themselves as that which their opponents are not. A bi-polar approach to all things – politics, art, design, engineering has been described as the hallmark of the modern age (Harvey, 1989). On the other hand, the concept that progression is marked by the rejection and then resurgence of ideas in an almost cyclical manner suggests that a strictly bi-polar approach is not accurate. Progression as re-thinking of rejected ideas benefits from Hegel's concept of the dialectic (For a more detailed overview of Hegel's work on the concept of the dialectic see Diesing, 1999). Through a dialectical process two antithetical forces meet and create a new, evolved set of ideas, questions and paradigms. This idea of the dialectic was used by Hegel to understand the development of the rational state. It is useful here in providing a depth grounding in thinking about how current legitimacy dialogues which either associate with or disassociate from the past have been formed.

For the exploration of legitimacy within the thesis, this reference to the past, either with positive or negative associations, can be understood as the marking of a fixed point from which change is experienced. Put slightly differently, dialogues revolving around temporal markers provide a historical context around which arguments are formed. This provides a common reference point for participants within the dialogue or set of dialogues.

Pair 2: Legitimacy dialogues which create or compound constituencies of interest and those which problematise or dissolve constituencies of interest

Discussions concerning modern social identities pivot around the creation of economically similar, geographically convergent or likeminded groupings of people or ideas, also deemed constituencies.⁷¹ Constituencies differ from communities. Communities involve common or shared ethical or moral values.⁷²

Communities could be viewed as the meta-level of unity. Constituencies exist as sub-levels and come together through specific interests. Traditional groupings – whether they be based on class, nationality, gender, religion or

⁷¹ A constituency can be described as a collective expression of concern; it is possible to think of constituencies as geographically bounded, for instance when we think of electoral constituencies or we may also think of moral, ethical or political constituencies, such as international support for human rights.

⁷² As Rawls (1999, p.20) states: "The members of a community are united in pursuing certain shared values and ends (other than economic) that lead them to support (the) association and in part bind them to it."

race can be better understood as constituencies of interest.⁷³ Constituencies of interest tend to be medium to long term associations, though these associations may not be homogenous; within each constituency there may be great differences. Drawing the members together is an ideological cohesiveness which may be experiential (age) or functional (work). These constituencies are typified by variety within the constituency but temporally are quite robust. Writers such as Clark (1984) and Barker (1990) view wooing types of interest group as a key way of cementing political legitimacy. From this perspective, legitimacy is linked with the rhetoric of policy rather than the substance of policy outputs.

Pair 3: Legitimacy dialogues that create or compound constituencies of issue and those that problematise or dissolve constituencies of issue

Returning to the concept of constituencies, we can see that describing constituencies of interest does not fully describe the types of dynamic relationships between distinct groups of people in modern political economies. Whereas constituencies of interest lead to loosely bound networks with the flexibility to be robust over long time periods, it is also possible to describe relationships where people are brought together over a cause which unites them, often leading to groupings where only the issue itself unites the identities of the group and there is no underlying ideology to which they

⁷³ There is a common theme that links these groups. Examples could be people who live in a street together, church members, peer groups or union members. What unites them is a common thread – using the above examples we can discern location, religion, age or work as the unifying element.

subscribe.⁷⁴ Examples include protests against building on protected land such as the Twyford Down campaign, internet groups which rallied around the MMR Vaccine, or Manchester United fans campaigning against a takeover bid in Spring 2005. These issue based constituencies are focused and have tightly defined areas of operation and timeframes – once the issue has been resolved these groupings are likely to dissolve or reconfigure over a different issue.

A second difference between interest and issue based constituency is their longevity. Though interest groups may have greater group loyalty there may be more financial and manpower resources quickly harnessed with issue groups. This may make them more likely to achieve a sudden impact on decision making processes. For this thesis, a comparison of these two constituencies provides an opportunity to assess how legitimacy relationships between water users and governance bodies may be differently impacted upon. A concern, and one that is highlighted in a later section, is that the boundary between interest and issue is not always clear. This is because members of one constituency can cross over into another where common interests are affected.

⁷⁴ Examples of these constituencies of issue, or 'New Social Movements' are campaigns to prevent the construction of a road through an area of countryside, the support of a fundraising event or an alliance to raise the profile of victims of torture. The issues can be local, temporal, international – political and non-political. Giddens (1990) has also described these new social movements as the demand for more meaningful participation. Melucci (1989) similarly terms the goal as the drive for alternative frameworks of meaning.

Pair 4: Legitimacy dialogues which move towards a known future and those which move towards an unknown or uncertain future

Policy is predicated on the concept of a rational and organised society.⁷⁵

Policy also works on assumptions about the future of society. Examples of dialogues that move to a known future are classical economic models of the world (Ricardo, 1951; Smith, 1991) and theories of modernisation (Rostow, 1960). The former is reliant on scientific assumptions of predictability; the latter is reliant on historical evidence. Both use retrospective analysis to justify the robustness or fitness of their logic.

Dialogues formed around certainty are very much a part of IWRM strategies in England and Wales. Both the supply and demand management phases currently in practise are based around concepts of measurement, thresholds, response times and control – using past examples and experiences as the gauge. Consequently flood defence systems use scientific principles and hydrological and meteorological data to build physical infrastructures which build on past examples. Demand management employs ‘current using’ practises against population growth figures together with current and future supply sources. Water transfer schemes use prior institutional experience to develop reliable project management plans. This ‘knowability’ of the future enables cross-checking of future plans and policies across institutions and

⁷⁵ Colebatch (1998, p.13) has described policy as a concept which ‘mobilises particular values. It expresses values of instrumental rationality and of legitimate authority’.

between different levels of management. For the end user – the householder, the industrial plant manager, the shareholder, there is continuity of price, supply and quality.

Dialogues that revolve around uncertainty question this certainty of policy formation and subsequently question the 'rational legitimacy' (Rogowski, 1974) that underpins policy making. Increasingly, uncertainty has become less of a problem to decision makers as risk analysis becomes a major element in planning techniques (Giddens, 1990). It is no longer uncommon for dialogues to revolve around unpredictable or emergent futures, particularly when dealing with natural resource phenomena such as water. The legitimacy dialogues model thus takes into account an appreciation of how uncertainty plays a part in shaping arguments between water users and government/ governance bodies.

6.5 Applying the legitimacy dialogues model to the empirical fieldwork

Having set out the conceptual parameters for the legitimacy dialogues model it was imperative to 'test' them. The most appropriate way of exploring the model's robustness was to undertake empirical research which would be able to recognise the presence of dialogues in the interactions between water users and government/ governance bodies. However, this validation of the model should not threaten the research to the extent that it jeopardises the other research criteria; for instance, the decision to undertake semi-structured

interviews with governance bodies and water users all along the Nene (see Chapter 7) should not be compromised by a desire to test for the existence of legitimacy dialogues. The most persuasive conclusion was to 'test' the legitimacy dialogues by identifying if they were present in an already completed piece of fieldwork: the Fens scoping interviews detailed in Chapter 5. This verification activity is detailed in the following section.

6.6 Evidence for legitimacy dialogues in the work completed so far

The Fens fieldwork, as already detailed in Chapter 5, was recorded through hand written notes taken down during both face to face and telephone interviews. Having reviewed the notes it is possible to isolate a number of prominent dialogues that appear throughout the interviews. The method used to denote the presence of legitimacy dialogues was to work through each interview and underline in the notes the presence of distinctive themes. This lead to the identification of seven themes, detailed in Table 9. The colours in brackets indicate a colour coding system used to easily highlight which theme appears within an interview:

1) Institutional

- relationships between institutions (shown in orange)
- resources i.e. funding, staffing, development issues (shown in orange)

2) Technology (shown in pink)

- 3) Climate change (shown in red)
- 4) Flooding (shown in green)
- 5) Siltation (shown in purple)
- 6) Sea Level rise (shown in black)
- 7) Development of a leisure based economy (shown in blue)

Each respondent's thematic response is listed in Table 8. These responses are then plotted into the legitimacy dialogues model by theme, as detailed in Table 9. The results indicate that each of the four paired legitimacy dialogues could be discerned from the Fens interviews. In other words the model does seem a credible way, if not fully exhaustive or comprehensive, of identifying how respondents rely on legitimacy dialogues to explain, justify, convince, reject or understand issues which affect their relationships with other water users and with water governance bodies.

Two outcomes were generated in the creation of Table 9. Firstly when plotting the type of legitimacy dialogue by theme it became clear that a further classification needed to be made; that of the neutral dialogue. Neutral dialogues appear when a reference is made to a theme, but not necessarily a positive or negative statement – there are dialogues which are non-judgemental or simply factual. These neutral statements do not add to the exploration of legitimacy, but they do enrich the legitimacy dialogues model by reiterating that not all speech acts necessarily engage actors in processes of persuasion or confirmation.

Secondly, plotting the dialogues into the model exposed a potential weakness: that of the subjective allocation processes of the researcher. As detailed above, there is often much overlap between constituencies of issue and that of interest, with constituencies of issue potentially forming sub-groups of interest groups. Deciding which narratives belong to which group is not always clear cut, particularly if the respondent's intention with their reply is ambiguous. Although the interviewer can try to minimise ambiguity from respondent replies this remains an unavoidable element of empirical research. Accepting that there is some subjectivity involved in the construction of the legitimacy dialogues model does not render it flawed. Rather, the conclusions drawn from it must be weighed against other evidence collected through empirical research. As the thesis utilises a multi-method approach, this reduces the impact of researcher subjectivity.

No	Respondent	Institutional relations	Staff/resources	Technology	Climate Change	Flooding	Siltation	Sea level rise	Leisure	total
1	Brewery	2	2							4
2	Farmer	2	1	2		1		1		7
3	Domestic consumer 1	1			3	2				6
4	Domestic consumer 2									0
5	Retired farmer 1	2	1			1				4
6	Parish Councillor	1				4		2		7
7	Domestic consumer 3		1		1					3
8	RSPB officer	3				8		2	1	14
9	Fenland District Council – staff								2	2
10	Middle Levels Commissioner	4	1				1	2		8
11	Domestic consumer 4									0
12	Marina owner		1			2	1			4
13	Inland Waterways Association	4				2	2			8
14	Anglian Water Services	6	4	2		1				13
15	Organic farmer									0
16	Tourist									0
17	Retired farmer 2	1	1			1	1	2	3	9
	Total	26	12	4	4	23	5	9	6	89

Table 8: Evidence of legitimacy dialogues within the Fenland scoping study

<p>Associate with past</p> <p>Institutional x1</p>	<p>Disassociate from past</p> <p>Institutional x 3</p> <p>Technology x3</p> <p>Leisure x 1</p> <p>Climate change x 1</p>
<p>Compound constituencies of interest</p> <p>Institutional x 5 neutral Institutional x3</p> <p>Flooding X 1 neutral Flooding x1</p> <p> neutral Siltation x 1</p>	<p>Dissolve constituencies of interest</p> <p>Institutional x 8</p> <p>Flooding x 1</p>
<p>Compound constituencies of issue</p> <p>Institutional x 1 neutral Institutional x 2</p> <p>Technology x 1</p> <p>Flooding x 7 neutral Flooding x 2</p> <p>Leisure x 1</p> <p>Siltation x 3 neutral Siltation x 1</p> <p>Sea level rise x 4</p> <p>Climate change x 1</p>	<p>Dissolve constituencies of issue</p> <p>Institutional x 5</p> <p>Flooding x 5</p>
<p>Move towards a known future</p> <p>Institutional x 3.....neutral institutional x 2</p> <p>Flooding x 5</p> <p>Leisure x 4</p> <p>Siltation x 1</p> <p>Sea level rise x 3</p> <p>Climate change x 1</p>	<p>Move towards an uncertain future</p> <p>Institutional x 5</p> <p>Flooding x 1</p> <p>Sea level rise x 2</p> <p>Climate change x 1</p>

Table 9: Distribution of Fenland scoping study results within the four paired legitimacy dialogues

6.7 Discussion

Retrospectively identifying the presence of legitimacy dialogues in an already completed piece of fieldwork helps strengthen the case that this model is a useful way of identifying the 'presence' of legitimacy within the relationships of water users and governance bodies. However, the model does not yet determine which of the pairs may be deployed when a dialogue is taking place. Referring back to Chapter 5, the research identified that research question five had not been addressed by any of the fieldwork activities. It was decided then to undertake a piece of research which addressed this question and also enabled further testing of the legitimacy dialogues model. This research activity is detailed in Chapter 7.

However, some provisional and tentative observations could be made at this stage. As detailed in Chapter 5, the fieldwork results indicated that there was no looming crisis of legitimacy between water users and governance bodies. No significant campaigns were present along the catchment, nor were there any apparent institutional crises. In short, the formal legitimacy framework appears stable. Yet this is not to say that there are no signs of dissatisfaction either amongst or between water users and governance bodies. Rather, there appears to be a tendency to accept that problems exist, but that the general standard of service within the current water management regime is at worst satisfactory and at best delivers a high level of confidence.

What became clear through analysing the fieldwork data is that examining legitimacy through formal sets of relationships, as detailed in Chapter 2, does not fully explain the concerns addressed by respondents. What was needed was an additional means to identify the presence of legitimacy within the formal and informal networks of actors who constitute water users and water governance bodies.

Although there appears to be stability in the relationships between water users and governance bodies, there is actually a series of issues which are being contested, with the authority or legitimacy of some governance bodies remaining unquestioned, such as the IDBs and MLC, whilst others, such as the EA and local councils, are having to prove their capacity to problem solve. The research raises the question as to how far these relationships may be tested if water stress becomes a common feature of the water regime within the catchment.

6.8 Conclusion

The aim of this chapter was to reflect on the results of the empirical fieldwork undertaken within the Nene catchment and assess how far these results inform the thesis' objective of exploring the role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

To help the thesis fully explore the relationships between water users and governance bodies, a consideration of a society coping with transformation was undertaken. Focusing on the South African experience, a 'legitimacy dialogues' model was created. This model allows the description of dialogues that build or block claims to legitimacy. The legitimacy dialogues model was validated by returning to the results of the Fens scoping study as outlined in Chapter 5. Were legitimacy dialogues present? The results showed that the legitimacy dialogues model is useful. This process of validation and review also led to the refinement of the model with the inclusion of the option for determining the presence of 'neutral' dialogues.

The model can be understood as a device that isolates how actors, or groups of actors, construct arguments to validate or invalidate a decision, process or institution. In terms of adaptation to water stress, it could be argued that understanding an actor's perception and articulation of a position could help water managers, planners and policy makers to determine strategies that comprehend these perspectives. If successful, this approach could lead to improved communication and reduced transaction costs associated with undertaking transformative change. Considering a scenario of impending water stress, an ability to quickly access these actors could also narrow the time lag which exists between policy formation and policy acceptance.

However, there was a problem with testing for legitimacy dialogues centred around water stress issues. As the thesis is attempting to capture attitudes

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about water stress and legitimacy without actually prompting respondents, the research is left with a double conundrum: how is it possible to talk about water stress without mentioning water stress? And further; how do we talk about legitimacy relations without actually mentioning legitimacy?

As outlined above, resolving this problem lead to the development of a further and final piece of empirical fieldwork. The fieldwork involved formal, structured interviews with water users and governance bodies in which two scenarios, both of which contribute directly to water stress, were discussed.

Respondents were provided with the interview questions in advance in order to give them time to reflect on their institutional and personal positions on both subjects. Issues of legitimacy are inherent within the questions, but a final unscheduled legitimacy question was added onto the interview at the very end. The fieldwork was constructed both to address the thesis' outstanding research questions and to provide a means of further testing the robustness of the legitimacy dialogues model. More detail is provided in Chapter 7.

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Chapter Seven: Structured interviews with water governance bodies and water user associations to discuss strategic planning along the catchment using water stress scenarios

7.1 Introduction

This chapter will develop an understanding of legitimacy dialogues initially explored in Chapter 6. For the purposes of policy analysis, it is necessary to explore how far these legitimacy dialogues may impact or shape the relationships between water users and governance bodies. Being aware of legitimacy dialogues may help understand stakeholder discussions in order to encourage participatory practises and shape issues for deliberation. This last research activity is therefore aimed at addressing these concerns.

It is worth, briefly, placing this chapter in the context of the preceding six chapters. The Fenland scoping study has indicated that a reflexive relationship exists between the two stakeholder groups. They are then not mutually exclusive i.e. decision making is not isolated completely from the policy subjects' inputs or opinions, nor are the stakeholder groups mutually dependent. However, both stability and progression are dependent on consensual relationships where both parties share goals. These relationships may be particularly vulnerable however when novel or unpopular policies or decisions are deployed, as indicated in Chapter 6.

This chapter will be organised as follows. Sections 7.2 to 7.6 will discuss the methodology and implementation of the fieldwork. Section 7.7 outlines the fieldwork results. Sections 7.8 through to 7.10 analyses and discusses the findings. The final Section, 7.11, sums up with conclusions regarding the contribution of the fieldwork to the thesis.

7.2 Methodology

Activity Aims

The objective of this fieldwork activity is to accomplish the following three aims:

1) To generate data explaining how different governance institutions and water user groups might respond to water stress drivers. Do they think the imagined water stress scenarios (detailed below) are likely, feasible or inevitable? What challenges do the imagined scenarios generate? Which or what type of institution is likely to lead the response or galvanise public opinion? What would the institution or user group like to see happen?

Asking these questions using a hypothetical scenario will provide the thesis with a greater understanding of the dynamics between the various stakeholders without generating confrontation. By positing the issues as possible future occurrences, there is an attempt to remove personal interest or sensitivity and instead focus on institutional capacity, process and planning.

This 'first order' analysis of the data will examine the content of response to identify trends with, and between, the two stakeholder groups.

II) A second aim is to undertake a 'second order' analysis, to determine the presence or absence of legitimacy dialogues. Analysis of the previous research stages, as detailed at length in Chapter 6, has shown that it is possible to discern four pairs of legitimacy dialogues namely:

Pair 1: Those which either associate with, or disassociate from, the past

Pair 2: Those that compound or problematise constituencies of interest

Pair 3: Those that compound or problematise constituencies of issue

Pair 4: Those that identify with a known future, or those that identify with an unknown future

Again, these four pairs do not pretend to provide an exclusive or comprehensive typology of all possible legitimacy dialogues. Rather, the model offers an approach which may illuminate this second order of analysis. Undertaking empirical fieldwork and interpreting the results in the light of the legitimacy dialogue models enables the thesis to explore how institutional/authority and water user/citizen positions might be constructed. If there is evidence for the dialogues in the interviews, the research activity will determine how the distribution between the four paired dialogues falls. There are three possible groupings for the dialogues that will be analysed:

a) dialogues that are used within a type of stakeholder group and are not related to scenario.

b) dialogues that form differently with each scenario and are not associated with a type of stakeholder.

c) dialogues that are used irrespective of stakeholder group or scenario.

(III) A third aim is to provide clarity for the thesis in terms of feasible policy options in response to water stress at a catchment level. This focus on responses to imagined water stress scenarios may:

a) Reveal how institutions and users relate to water stress concerns and construct their opinions, responses and protocols accordingly.

b) Explore how the two stakeholder groups construct water stress scenarios as either 'natural' or 'human' driven problems. This may help water managers or policy makers understand how institutions themselves view control or access of an issue.

c) Develop policy options which present issues in different ways, with a different 'legitimacy dialogue' mix to stimulate involvement, interest and funding amongst different stakeholders or stakeholder constituencies.⁷⁶

⁷⁶ New Social Movement theory (NSM) argues that stakeholder groups are dynamic and often change their constituents over time. See Melucci, 1989.

7.3 Designing the research activity

Utilising similar criteria to those outlined in Chapter 5, a face to face structured interview was determined as the most reliable and robust means of eliciting the type of data required.

Whereas the household questionnaire was predicated on a need to obtain a representative sample of the entire River Nene catchment, and so relied upon a sample which reflected the demographics of the catchment population, the target population of this fieldwork exercise were those governance bodies and water user associations affiliated with the River Nene. Water user associations were selected as a concern rather than individual users. The interviews explore institutional capacity along the catchment to implement strategic planning; subsequently a certain level of knowledge and engagement with a broad range of water issues was vital and not necessarily accessible from individual water users. Governance bodies also have a level of knowledge of issues connected with the river that is not always present with household consumers. It was felt that accessing water user associations would prove the most time efficient way to access articulate water users who would be able to provide an informed comment on issues dealing with water stress within the river catchment.

Potential respondent groups were selected from researcher knowledge of existing stakeholder groups gained through the various pieces of fieldwork already completed. Invitations to take part in the interview process were sent

to all pertinent water user and water governance organisations that were deemed able to comment on water stress issues within the catchment. In order to do this it was necessary to isolate which water stress drivers or concerns would be both applicable and relevant to stakeholders all along the river corridor.

It was decided that in order to engage respondents the water stress concerns should be tangible and reflect real world experiences. Providing extreme or unlikely scenarios to comment on would not elicit useful answers. The interview was then shaped around two issues or scenarios. This form enabled respondents to focus on a scenario that reflected their interests or working experience.

The first scenario concerned flooding. It was designed to gauge what respondents felt were the cause or causes of flooding and to ascertain responses to a series of questions concerning water management issues and flooding. The second scenario aimed at understanding how rapid urban development in the catchment may impact on Nene water management issues. This scenario was particularly pertinent as the government ministry of the Office of the Deputy Prime Minister (ODPM) had announced on the 5th February 2003 that a development plan for the South East of the country was envisioned, with up to 800,000 new homes to be constructed in the vicinity of the River Nene corridor by 2031 (<http://news.bbc.co.uk/1/hi/england/2727399.stm>). As

a portion of these homes are designated to lie within the River Nene catchment, these development plans will impact upon water supply.

Respondents from the two stakeholder groups were selected according to the following criteria:

- 1) That respondents have an interest in water resources management in some capacity, either formally or informally (i.e. either in a professional or voluntary role). Respondents to include regulators, boating associations, farmers or members of local residents associations.**
- 2) That respondents were operational at the catchment level; i.e. their interest, responsibility or jurisdiction was mainly focused on the River Nene. This excludes the involvement of regional and national bodies.**
- 3) That respondents would be able to make a significant and worthwhile contribution to the exploration of the two scenarios. The phrasing of the invitation to interview letter was designed with this in mind. The letters asked respondents to suggest an alternative contact from within their organisation if the addressee was not the most appropriate person (see Appendix 3 and Appendix 4). Selecting appropriate stakeholders was then predicated on their ability to engage with both of the forecast scenarios.**

The interviews were designed to last for between 30 to 40 minutes. Asking interviewees to devote more time may have reduced the number of respondents willing to participate, particularly those with busy schedules. The aim was to include as many relevant stakeholders as possible.

The interview timings break down as follows: 5 minutes to introduce the research and run through issues of anonymity, data protection and research ethics, 10 to 15 minutes on each of the scenario questions (20 to 30 minutes in total) and 5 minutes to conclude and inform about contact details and the possibility of a follow-up call to clarify any details.

The interviewees were first approached by a letter which was sent at the beginning of August 2004, inviting them to participate in a brief interview in either September or October 2004 (see Appendix 3). At the bottom of the letter was a tear off reply slip for ease of response. This tear off slip also provided space for the invitee to suggest another more appropriate contact where necessary. The letter was despatched with a stamped addressed envelope. Of the 24 letters sent 11 replies were received by the end of August 2004. No response lead to a follow up letter (Appendix 4).

For those who had agreed to be interviewed a thank you letter (see Appendix 5) was sent which included the following information to prepare them for their interview:

- a) That the interviews would focus on issues connected with two scenarios: (i) future flooding events (ii) large scale urban development. These future scenarios are both pertinent to the catchment and emblematic of UK catchments in demographically mobile regions.

- b) That the interviews ask them to answer from a professional capacity in their role in water management or water stewardship, i.e. as chair of their resident's committee or drainage engineer.**
- c) That their answers contribute to a body of work that addresses concerns about integrated water resource management in the River Nene catchment.**
- d) That they remain professionally anonymous, unless they are happy to be named or cited in interview quotes. Respondents were nominally split into 'authority' or 'citizen' categories to maintain confidentiality.**
- e) Respondents were also reminded that the timescale of scenarios involved a projection into the future i.e. from now until 2015. Containing responses within a 10 year timeframe helps focus on possible, feasible solutions to problems.**

Some 13 invitees who had not responded were telephoned during the first two weeks of September 2004. These follow up calls generated 11 respondents, bringing the total figure of respondents up to 22. Of these final 22, one respondent fell ill and was unavailable for interview. Having seen the interview questions a second respondent cancelled as he felt he did not have the requisite knowledge of the catchment to be useful to the interview. The list of the final respondent's organisations and their assignation to a relevant stakeholder 'type' is outlined in Table 11.

To use the interview time more efficiently the interviewees were provided with a list of the interview questions, so they had time to:

- (i) Prepare a response.
- (ii) Where appropriate check the official institutional response.
- (iii) Gather any data they felt was relevant to the question.
- (iv) Think about other respondents or contacts who they felt it would be useful to interview (snowballing).

As each set of scenario questions (Table 10) had to be completed within a 10 to 15 minute timeframe, and as the questions had to be general enough to elicit open response without any guidance, the questions were made deliberately simple to understand and broad enough in scope to accommodate different levels of expertise:

Flooding scenario	Rapid development scenario: Milton Keynes quadrangle
1) From your organisation's perspective what causes flooding along the River Nene? 2) What are the solutions to flooding along the catchment? 3) Who or what should provide these solutions – and is this institutional mix currently in place? 4) What prevents or may hamper this institutional mix from developing solutions? (e.g. time, expertise, resources) 5) What does your organisation believe needs to be done at the catchment level to lessen the risk of flooding?	1) Do you think that the proposed rapid urban development will have a significant impact on the river and, if so, why? 2) What will be the benefits and costs (e.g. environmental, social and financial) at catchment level of such development along the river? 3) Which organisations are championing these development plans? 4) Does your organisation feel the appropriate people and institutions at catchment level have been consulted and involved in the strategic planning stage? 5) What outcomes would your institution like to see with regards to this proposed Milton Keynes quadrangle scheme?

Table 10: Structured interviews scenario questions

The interviews are not time sensitive, in terms of when the fieldwork is conducted, as long as there is no major event or media discussion connected with the two scenarios or with the catchment which may affect responses. The interviews are not affected by seasonal influences, though it was desirable that interviews should be undertaken as closely together as possible to reduce the risk of external events influencing response. All the interviews were conducted in person between September and October 2004.

7.4 Data collection

Data collection was primarily conducted through the use of a digital Dictaphone. Equipment failure precluded the use of a second 'back up' Dictaphone. Instead notes were taken during interviews. This was to ensure that there were secondary notes in case of primary equipment failure. The analysis of the interviews was then to be drawn from the transcripts of the interviews.

7.5 The scenarios

The current model for the concept of the legitimacy dialogues (see Chapter 6) has four paired 'types' which are clearly distinguishable from each other. It is argued within this thesis that these dialogues are not binary i.e. inclusion in one pair does not preclude inclusion in another. Actors, ideas and policies may cross over between these classes. However, a legitimacy dialogue that

appears in contrary ways within a pair would infer that the respondent is presenting a contradictory argument.

As stated above, the two scenarios selected have been chosen to reflect drivers which have a potential impact on the river and which will almost certainly have an impact on it in the future. Both scenarios are typified by contributing to water stress. To reiterate, the scenarios are selected in order to:

- i) Help identify if relationships of trust and legitimacy appear to be flourishing from the perspective of the respondent.
- ii) Map the different formal and informal governance actors, institutions and networks as perceived by the respondent.
- iii) Explore the role and type of legitimacy dialogues expressed in response to the scenario (for instance are the 1998 Easter floods a historic benchmark which is relegated to the past; are stakeholders united in combating flooding; can we distinguish stakeholders by their interest groups e.g. conservationists, leisure users and regulators).

Points i) to iii) above complement the research aims and fieldwork questions outlined earlier in the chapter to provide clear outcomes for the research activity. The expected outcomes were:

- 1) Provide data which isolates stakeholder's responses to water stress scenarios.

- 2) Identify if relationships of trust and legitimacy are evident amongst the stakeholders.
- 3) Find evidence for the presence or absence of legitimacy dialogues.
- 4) If legitimacy dialogues are present, determine the nature of their construction and deployment.
- 5) Contribute to policy makers' understanding of how water stress is understood by different stakeholders.

7.6 Interview protocol

The researcher interviewed each of the twenty respondents either at their place of work or at a location convenient to them. Researcher safety procedures were followed. As with the research outlined in Chapter 5, ethical research guidelines were followed using the British Sociological Society code of practise (2002). Research was conducted following the procedures outlined under the Data Protection Act (1998). The final confirmation of interview letter (Appendix 5) was sent at least five working days before the interview date, along with a copy of the interview questions. The interviewer also either telephoned or emailed the day before the interview to confirm time and location of interview. Respondent details are outlined in Table 11.

At the start of each interview, the researcher reminded the interviewee of the purpose of the interview. The researcher also reiterated the ethical and confidentiality protocols of the research. Respondents were also reminded

that they could withdraw from the interviews at any stage and that they would be given a copy of the interview transcript for their approval. As stated, each separate interview was recorded onto a digital Dictaphone.

At the beginning of the interview each respondent was assigned a reference number (see Table 11) in order to keep their identity confidential. The date of the interview was verbally logged onto the Dictaphone by the interviewer, along with the reference number at the beginning of the interview. The next section will catalogue the steps taken to prepare and then analyse the data.

No	Interview reference	Organisation type and narrative	Stakeholder type	Social solidarity of stakeholder
1	RES436	Environmental group: Involved in wildlife conservation, lobbying and sustainable land management practises.	Water User	Activist/Research
2	RES401	Water regulator: Involved in water supply and utility infrastructure planning.	Governance Body	Regulator/ Governance
3	RES412	Waterway users group; Involved in navigation rights, the development of the river for leisure users.	Water User	Activist/Research
4	RES410	Internal drainage board: Local jurisdiction in drainage issues along the River Nene corridor.	Water User	PrivateSector
5	RES433	Engineering consultancy: Sub contracted by government to undertake engineering works and feasibility studies.	Governance Body	Private Sector
6	RES408	Planning manager: Senior manager operating at City council level responsible for overseeing regional development.	Governance Body	Regulator/Gover nance

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No	Interview reference	Organisation type and narrative	Stakeholder type	Social solidarity of stakeholder
7	RES421	Water regulator: Ensures river water quality and a sustainable river corridor environment, liaises with local stakeholders	Governance Body	Regulator/Governance
8	RES423	Journalist: Senior journalist with 20 years expertise reporting on local news involved with the local community regarding 1998 floods and their aftermath.	Water User	Activist/Research
9	RES449	Farmer's group: Involved in lobbying, policy mediation and information dissemination. Representing agribusiness, family farmers and tenant farmers in local area.	Water User	Private Sector
10	RES331	Farmer's group: Involved in lobbying, policy mediation and information dissemination. Representing agribusiness, family farmers and tenant farmers in local area.	Water User	Private Sector
11	RES406	Planning manager: Working at town council level, involved in planning future growth and implementing government policy.	Governance Body	Regulator Governance
12	RES435	Water regulator Involved in policy formation and deployment at national level and with implementing EU policy.	Governance Body	Regulator Governance
13	RES434	Food producer's group Consultant providing guidance and business expertise to local food producer's consortium.	Water User	Private Sector
14	RES405	Planning manager: District council planner at junior level involved in planning applications and developing growth.	Governance Body	Regulator Governance
15	RES411	Internal drainage board: Local jurisdiction in drainage issues along the River Nene corridor.	Water User	Private Sector

No	Interview reference	Organisation type and narrative	Stakeholder type	Social solidarity of stakeholder
16	RES402	Planning manager: Working at city council level undertaking a wide range of planning decisions and implementing government policy.	Governance Body	Regulator Governance
17	RES422	Policy researcher: Works on a government funded project to forecast future water demand profiles. Liaises closely with government and other research institutions.	Governance Body	Activist/Research
18	RES431	Environmental group: Local manager of campaigning conservation charity involved in wildlife and landscape protection.	Water User	Activist/Research
19	RES433	Environmental consultant: Formerly employed with a water regulator, now provides consultancy expertise. Key knowledge in flood amelioration policy and river corridor changes over 30 years.	Governance Body	Private Sector
20	RES426	Member of parliament: Constituency lies within the river corridor. Particular expertise on the impacts of flooding on local communities.	Governance Body	Regulator Governance

Table 11: Detail of respondents, and their stakeholder type, involved in the structured interview fieldwork activity

7.7 Results

Each interview was transcribed verbatim.⁷⁷ Significant pauses are identified by dotted lines and the transcriber notes when responses are inaudible. No sophisticated transcribing annotations were included in the transcription process. Usually these annotations are employed to highlight, amongst other things, brief pauses, hesitations in response and points at which interviewer

⁷⁷ Interview transcripts are available for examination.

and interviewee talk over each other. These annotations also include the numbering of lines to help the person using the transcription refer to appropriate passages.

This level of detail was not included in the transcription process for a number of reasons. Firstly, the type of analysis being undertaken with the transcripts is not essentially linguistic in nature i.e. the analysis is not overly concerned with detail such as syntax construction, deliberate stress on a syllable or confusion of words. Brief pauses or hesitations are not a concern in interpreting the nature of the response to the question. Instead, the analysis is interested in the content of what is being said. It is concerned specifically with the presence of legitimacy dialogues, the structure of responses in terms of argumentation or emphatic answers. Secondly, the transcription process was subject to time and financial constraints, both of which would have been severely constrained by including a much more detailed approach to the transcription process.

The researcher back-checked the accuracy of the transcript by selecting three random points within each interview and replayed the audio interview against the transcript to validate consistency. No significant errors were found. The original audio versions of the interviews are available on request. Seventeen of the interviews are available digitally; three are re-recorded onto mini-disc due to software failure.

7.8 Content analysis

The first stage of the data analysis process was to work through the interview transcripts⁷⁸ summarising what each respondent answered for each of the 12 interview questions (5 questions for the flooding scenario, 6 questions for the Milton Keynes Quadrangle scenario and 1 on legitimacy – see Appendix 6).

What can be expected from undertaking a process of content analysis? Given the nature of the questions, i.e. open responses to pre-seen questions eliciting organisational rather than personal responses; it is possible to say that informed, deliberated answers which reflect an organisational position regarding both scenarios can be expected. If respondents feel unclear or unhappy presenting an organisational response, or if they personally feel strongly about the question, they indicate that the response is a private opinion. The final question, which concerns legitimacy, is the only 'unseen' question and so one which is likely to garner either no response or potentially 'wildcard' responses.

A summary of the content of all respondent's answers reveals that there is a high response rate to questions, i.e. those who agreed to participate in the interviews were able to provide at least some level of response to each question. Table 12, below, outlines questions answered by respondents using a tick against their reference number, and those which generated a 'don't know', or a 'can't comment' response are indicated with a cross against their

⁷⁸ Interview transcripts are available for examination.

reference number. Respondent numbers highlighted in red are authority figures, those in black are citizen figures.

As can be seen, the majority of respondents are able to provide an answer to most questions. Flooding questions have a high response rate, whilst the Milton Keynes and legitimacy questions have a higher level of non response.

Three out of the seven regulation/governance respondents (43%) provide non responses compared with five out of eight private sector respondents (63%).

Activist respondents have the lowest level of non response at 20% (one out of the five respondents). It is not possible to discern a predisposition of any of the three groupings to non-reportage.

	Q1 FI	Q2 FI	Q3 FI	Q4 FI	Q5 FI	Q1 MK	Q2 MK	Q3 MK	Q4 MK	Q5 MK	Q6 MK	Leg
R1	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓
R2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R4	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R6	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓
R7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R9	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓
R10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R11	✓	✓	✓	✓	✓	✓	X	✓	✓	X	✓	✓
R12	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X
R13	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	X
R14	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R15	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X
R16	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R17	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R18	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R19	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓
R20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 12: Overview of participant response to each interview question (red font are authority respondents, black font are private sector respondents and green are activist respondents)

Returning to the thesis research questions, a more detailed content analysis reviewing those questions is outlined in the discussion section of this chapter.

7.9 Evidence for legitimacy dialogues

As the legitimacy dialogues are a theoretical model, (i.e. they are experimental and exploratory within this thesis), there is no developed methodology for detecting their presence or absence. The verification process is then dependent upon setting a clear protocol.

Having identified the four paired dialogues in Chapter 6, an agenda for dialogue characterisation is clear. Firstly, any verbal reference to the past or future is valid; more specifically, any reference which indicates a preference, criticism, nostalgia or empathy is to be noted. Any historical or future reference which is passive can be deemed 'neutral'. The verification or identification of 'interest' or 'issue' dialogues is more complex. As detailed in the methodology (Chapter 3) the approach undertaken within this thesis is reflexive – all data is subject to interpretation and contextualisation. This is both true of the need to be sensitive to the organisation that is responding to the question and to the question to which they are responding.

Returning to Chapter 6, it was argued that the development of constituencies of 'interest' and those of 'issue' are a relatively new phenomenon identified within the social sciences and have been provided with the term 'new social

movements'. Moving away from the ideology based distinction of class which dominated social science literature, a new paradigm of analysis views social make-up as more complex and mobile. In short, although we can attribute issue based constituencies as short lived and fixed upon a single event or concern and interest based constituencies as more closely aligned with affiliations concerned with class, gender, religion, nation-hood or age, these two constituencies may coalesce at times. There is then no fixed impermeable boundary between the two.

How is it possible to account for this in the data analysis? The most helpful method to adopt is a simple one. Given the researcher's knowledge of the catchment, the clearest approach is to use experience and discernment to catalogue whether a phrase utilised is one which deals with an 'issue' or represents an 'interest'. Generally, if the response is dealing with an event and specifically refers to that event, such as a flood event or planning application, it is treated as an 'issue' legitimacy dialogue. If the phrase refers to a long standing area of concern, such as responses to flooding or access to information, it is treated as an 'interest' legitimacy dialogue. Although this approach is prone to criticisms of arbitrariness, the experimental and evolutionary nature of the theoretical model makes this necessary.

As detailed above, each transcript was scrutinised for evidence of phrases that corresponded with the four paired legitimacy dialogues. Individual words are in themselves not enough to convey or communicate a position statement.

Instead phrases or statements which refer to the past or future can be clearly discerned and identified as having a tendency to either associate with or disassociate from the past, or move towards either a known or an unknown future. The dialogues which isolate constituencies of interest or issue are, as has been argued, more difficult to determine and lends to them a certain degree of subjectivity as their identification is up to the judgement of the researcher. However, criteria for analysis have been outlined above and have been systematically applied throughout to the text. Each legitimacy dialogue for each question is then individually numbered and entered at the end of each question into a 'legitimacy dialogue model' which illustrates both the number of legitimacy dialogues used per answer and the type of paired legitimacy dialogues deployed (see Table 14). Those legitimacy dialogues which do not forward a position but are merely mentioned are deemed 'neutral' and sit in the middle of the model for its associated paired dialogue (see Table 14).

Legitimacy dialogues as a percentage of question response

In this data analysis exercise, a word count was conducted of each question response for each respondent for both the scenarios and for the final legitimacy question. This is to calculate the percentage of the overall interview that can be ascribed to each scenario. A separate word count was conducted for each time a legitimacy dialogue appears. A final percentage total was then calculated to isolate what proportion of all question response was comprised

of legitimacy dialogues within each scenario. Responses are illustrated in

Table 13 below; respondent numbers reflect those in Table 11.

Name (red authority, black citizen, green activists)	Flooding Scenario	Milton Keynes scenario	Legitimacy	Total of overall response
Respondent 1	32.5%	13.8%	10.8%	22.4%
Respondent 2	30.4%	21.9%	10.2%	25.2%
Respondent 3	24.2%	18.8%	18.1%	20.1%
Respondent 4	15.1%	22.2%	15%	19.4%
Respondent 5	32.8%	26.4%	6.3%	28.3%
Respondent 6	22.3%	16.6%	10.2%	18.8%
Respondent 7	28.9%	21.7%	-	25.1%
Respondent 8	15.3%	8.8%	14.9%	12.3%
Respondent 9	49.7%	30.4%	44.4%	45.1%
Respondent 10	38.8%	19.4%	13.1%	27.9%
Respondent 11	31%	21.2%	14.9%	23.9%
Respondent 12	19.9%	21.9%	-	20.1%
Respondent 13	23.2%	8.6%	-	13.6%
Respondent 14	37.9%	24.1%	44.2%	30.2%
Respondent 15	30.8%	37.4%	-	32.5%
Respondent 16	35.8%	32.3%	40.7%	34.8%
Respondent 17	25.3%	26.5%	33.7%	26.2%
Respondent 18	13.6%	8.8%	7.9%	10.2%
Respondent 19	17.4%	8.2%	7.4%	14.5%
Respondent 20	25.2%	18.2%	12%	21.6%
Total average %	27.5%	20.3%	18.9%	23.6%

Table 13: Percentage of total structured scenario interviews constituted by legitimacy dialogues

The above table illustrates that legitimacy dialogues form a significant proportion of respondent's replies to interview questions. It should be re-

iterated that these are responses to pre-viewed questions, providing respondents with time to prepare and reflect upon their responses. In terms of scientific testability, no 'control' interviews have taken place to measure the relative absence or presence of legitimacy dialogues that might occur within the course of a spontaneous conversation with the respondents. This however should not impact on the results, as the object is not so much to measure or test what environments may be conducive to developing legitimacy dialogues, but rather to be able to detect them and interpret or contextualise them.

The above percentage figures demonstrate that in response to pre-known questions, legitimacy dialogues are utilised as a means to explain or shape a response. As can be seen, the amount by which a legitimacy dialogue is utilised varies greatly, with the average figure over all the respondents at 23.6%. The lowest use is demonstrated by respondent 18, an activist stakeholder from an environmental group, with 10.2% of response comprising legitimacy dialogues, and the highest use is 45.1% respondent 9, a private sector stakeholder representing a farmer's group.

The bar chart below (Figure 24) illustrates that there is no clear distinction in the use of legitimacy dialogues by any of the three respondent group type.

This informs us that although it is possible to say that legitimacy dialogues are utilised by all respondents, and therefore strategically used across both groups, it is not possible to conclude from their presence alone how they are deployed. For that, further analysis to ascertain what the legitimacy dialogues

are comprised of, and in response to which questions they are being deployed, needs to be undertaken. This data analysis exercise is detailed below through the presentation of cluster models (Figures 25 to 32).

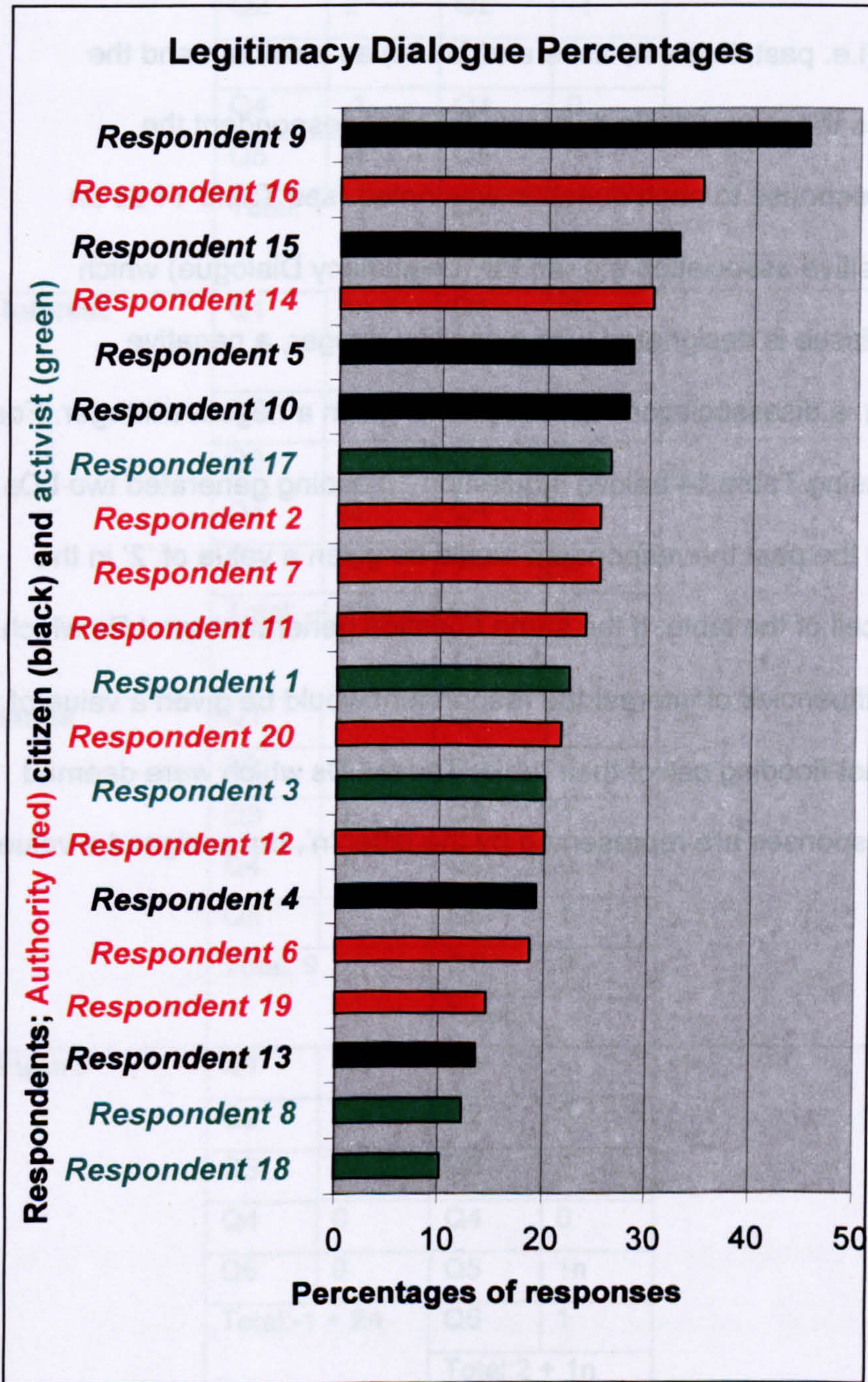


Figure 24: Percentage presence of legitimacy dialogues affiliated with structured scenario interviews' respondent type

Governance bodies (authority) and water users (citizens) paired clusters

In this data analysis exercise each respondent's legitimacy dialogue (LD) was attributed to one of the four paired dialogues. A table was constructed with the dialogue types (i.e. past, interest, issue and future) as a column and the scenarios across the rows. Within this table for each respondent the frequencies of response to each question was noted (see Table 14 as an example). A positive association e.g. an LD (Legitimacy Dialogue) which compounds an issue is designated with a positive integer, a negative association, e.g. a disassociation with the past is given a negative integer. For example (and using Table 14 below) if question 1 flooding generated two LDs associated with the past the respondent would be given a value of '2' in the 'past-flooding' cell of the table. If the same question generated two LDs which dissolved constituencies of interest the respondent would be given a value of '-2' in the interest-flooding cell of their table. Those LDs which were deemed to be neutral responses are represented by the letter 'n', but assigned a value of zero.

The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

Respondent: ME	Flooding Scenario		MKQ Scenario		Legitimacy Question	Total
Past	Q1	2	Q1	0	0	1
	Q2	2	Q2	-1		
	Q3	-1	Q3	1		
	Q4	-1	Q4	0		
	Q5	-1	Q5	0		
	Total: 1		Q6	0		
		Total: 0				
Interest	Q1	1n + -2	Q1	0	1	3 + 1n
	Q2	0	Q2	0		
	Q3	1	Q3	2		
	Q4	-2	Q4	1		
	Q5	-1	Q5	3		
	Total: -4 + 1n		Q6	0		
		Total: 6				
Issue	Q1	3	Q1	1	3	15
	Q2	2	Q2	0		
	Q3	0	Q3	1		
	Q4	3	Q4	0		
	Q5	1	Q5	1		
	Total: 9		Q6	0		
		Total: 3				
Future	Q1	-1	Q1	-1	-1	0 + 3n
	Q2	0 + 2n	Q2	0		
	Q3	0	Q3	2		
	Q4	0	Q4	0		
	Q5	0	Q5	1n		
	Total: -1 + 2n		Q6	1		
		Total: 2 + 1n				

Table 14: Example of legitimacy dialogue frequency counts for each interview question for respondent 8

These values for each response to every question are then totalled in each cell to provide an overall value. These values are plotted onto cluster graphs (Figures 25 to 32) which display the presence of legitimacy dialogues. Figures 25 to 28 present the results for each scenario; Figure 25 displays the results of combining both scenarios and the legitimacy question; Figure 26 displays results from the flooding scenario; Figure 27 from the Milton Keynes Quadrangle scenario and Figure 28 the legitimacy question. Rather than display results for each separate paired dialogue, 'interest' and 'issue' responses are teamed together in Figures 25 to 28, with 'interest' along the x axis and 'issue' along the y axis. 'Past' and 'future' legitimacy dialogues are treated similarly in Figures 29 to 32. Using Figure 25 as an example, Quadrant A displays those respondents with a propensity to use legitimacy dialogues that problematise and dissolve constituencies of interest but compound and create constituencies of issue. These graphs are then visual representations of the legitimacy dialogues deployed by respondents. These graphs then depict both individual's response to questions along with similarities and differences between respondents. What is depicted is any 'clustering' between similar responses per scenario and 'disparity' between different views between stakeholders.

As stated, there are eight graphs in all. One set of four graphs (Figures 25 to 28) compare 'interest' and 'issue' legitimacy dialogues in the context of flooding, the Milton Keynes development, the legitimacy question and finally a graph which combines all three. The second set of four (Figures 29 to 32)

compare 'past' and 'future' in the same format. To help see clearly which respondents are authority (governance body) stakeholders and which citizen (water user) stakeholders, authority types are given a red font and citizen types black font. The break down between each grouping is listed in Table 11: The eight graphs and attendant analyses are listed below.

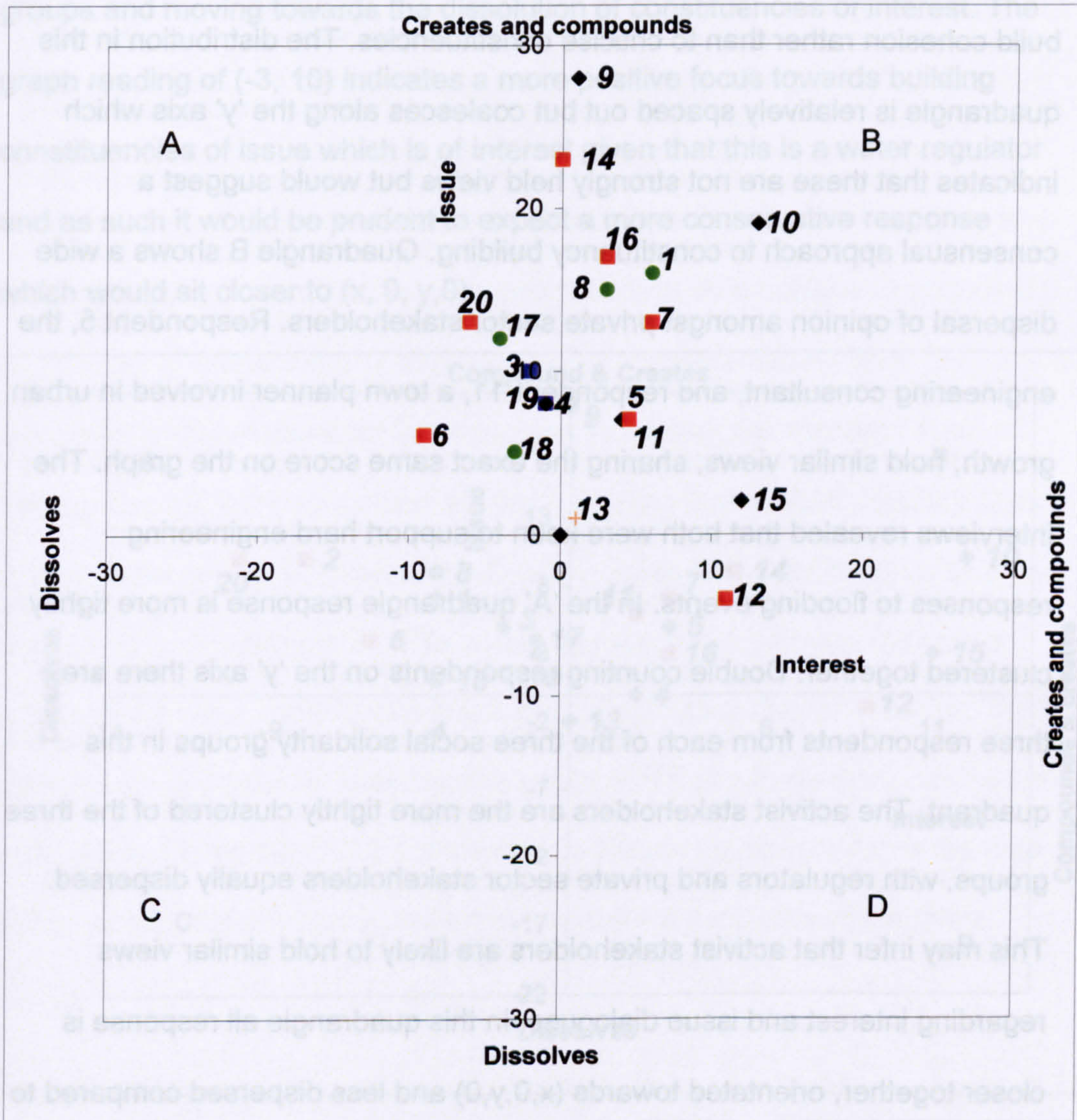


Figure 25: Regulators (red), private sector (black) and activist (green) 'interest' and 'issue' legitimacy dialogues combined

Figure 25 illustrates that when looking at 'interest' and 'issue' legitimacy dialogues which combine flooding, Milton Keynes development and legitimacy questions, the majority of response sits in the upper right 'creates and compounds' quadrangle B. This distribution shows that the legitimacy dialogues used here support the creation of constituency types and tend to build cohesion rather than to criticise constituencies. The distribution in this quadrangle is relatively spaced out but coalesces along the 'y' axis which indicates that these are not strongly held views but would suggest a consensual approach to constituency building. Quadrangle B shows a wide dispersal of opinion amongst private sector stakeholders. Respondent 5, the engineering consultant, and respondent 11, a town planner involved in urban growth, hold similar views, sharing the exact same score on the graph. The interviews revealed that both were keen to support hard engineering responses to flooding events. In the 'A' quadrangle response is more tightly clustered together. Double counting respondents on the 'y' axis there are three respondents from each of the three social solidarity groups in this quadrant. The activist stakeholders are the more tightly clustered of the three groups, with regulators and private sector stakeholders equally dispersed. This may infer that activist stakeholders are likely to hold similar views regarding interest and issue dialogues. In this quadrangle all response is closer together, orientated towards $(x,0,y,0)$ and less dispersed compared to Quadrangle B. This indicates a similar line of argument by all three stakeholder groups as a more extreme set of responses which would have lead to a wider dispersion away from the nadir point. This quadrangle, which

expresses legitimacy dialogues which build constituencies of issue and dissolve constituencies of interest, indicates a desire to focus on short term relationships and groupings rather than long term issues. Finally there is only one rogue respondent, a water regulator with responsibility for policy deployment who sits in quadrangle D, with a bias towards building issue groups and moving towards the dissolution of constituencies of interest. The graph reading of (-3, 10) indicates a more positive focus towards building constituencies of issue which is of interest given that this is a water regulator and as such it would be prudent to expect a more conservative response which would sit closer to (x, 0, y,0).

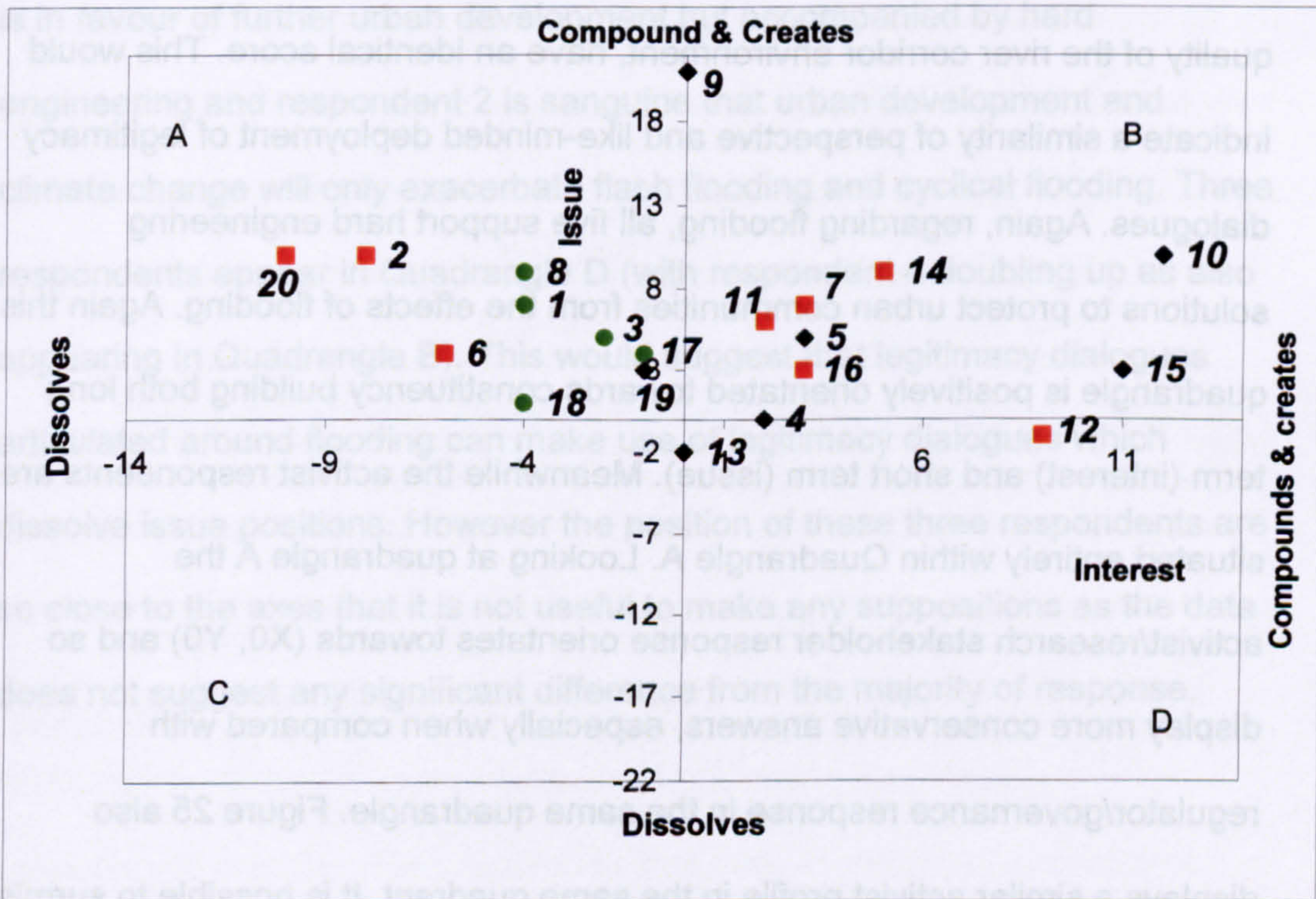


Figure 26: Regulators (red), private sector (black) activists (green) 'interest' and 'issue' legitimacy dialogues flooding only

Figure 26 displays some notable differences when compared with Figure 25. Although quadrangles A and B are again those most utilised, and similar suppositions can be made, as were detailed above for Figure 25, the population within these quadrangles is markedly different. In quadrangle B the population is split equally (5 apiece) between private sector and regulatory/governance respondents; no activist stakeholders are present in this quadrangle. The regulatory/governance respondents are clustered quite closely together orientated near to the (x0 y0) coordinates when compared to the private sector respondents. These respondents 11, 7, 14, 5 and 16 are three planners, an engineering consultant and a regulator involved in the quality of the river corridor environment, have an identical score. This would indicate a similarity of perspective and like-minded deployment of legitimacy dialogues. Again, regarding flooding, all five support hard engineering solutions to protect urban communities from the effects of flooding. Again this quadrangle is positively orientated towards constituency building both long term (interest) and short term (issue). Meanwhile the activist respondents are situated entirely within Quadrangle A. Looking at quadrangle A the activist/research stakeholder response orientates towards (X0, Y0) and so display more conservative answers, especially when compared with regulator/governance response in the same quadrangle. Figure 25 also displays a similar activist profile in the same quadrant. It is possible to surmise that legitimacy dialogues are deployed by this group in identical ways. This would suggest that activist/research groups are more likely to use legitimacy dialogues to downplay the existence of, or criticise, interest groups whilst

championing constituencies of issue, whilst regulatory/governance types may articulate similar sentiments (as they appear in the same quadrangle) but unusually in a less conservative manner. This would suggest that regulatory/governance stakeholders are happy to forward a more radical or embedded response than citizen/research types. When we look at the three regulatory respondents, 20, 6 and 2, they are all in very responsible positions with a great deal of expertise. They are respondents who are willing to proffer controversial opinions and disagree with some existing policy decisions. With regards to flooding issues respondent 20 is adamant that planning policy and land use regimes need to change to protect urban communities; respondent 6 is in favour of further urban development but accompanied by hard engineering and respondent 2 is sanguine that urban development and climate change will only exacerbate flash flooding and cyclical flooding. Three respondents appear in Quadrangle D (with respondent 4 doubling up as also appearing in Quadrangle B). This would suggest that legitimacy dialogues articulated around flooding can make use of legitimacy dialogues which dissolve issue positions. However the position of these three respondents are so close to the axes that it is not useful to make any suppositions as the data does not suggest any significant difference from the majority of response.

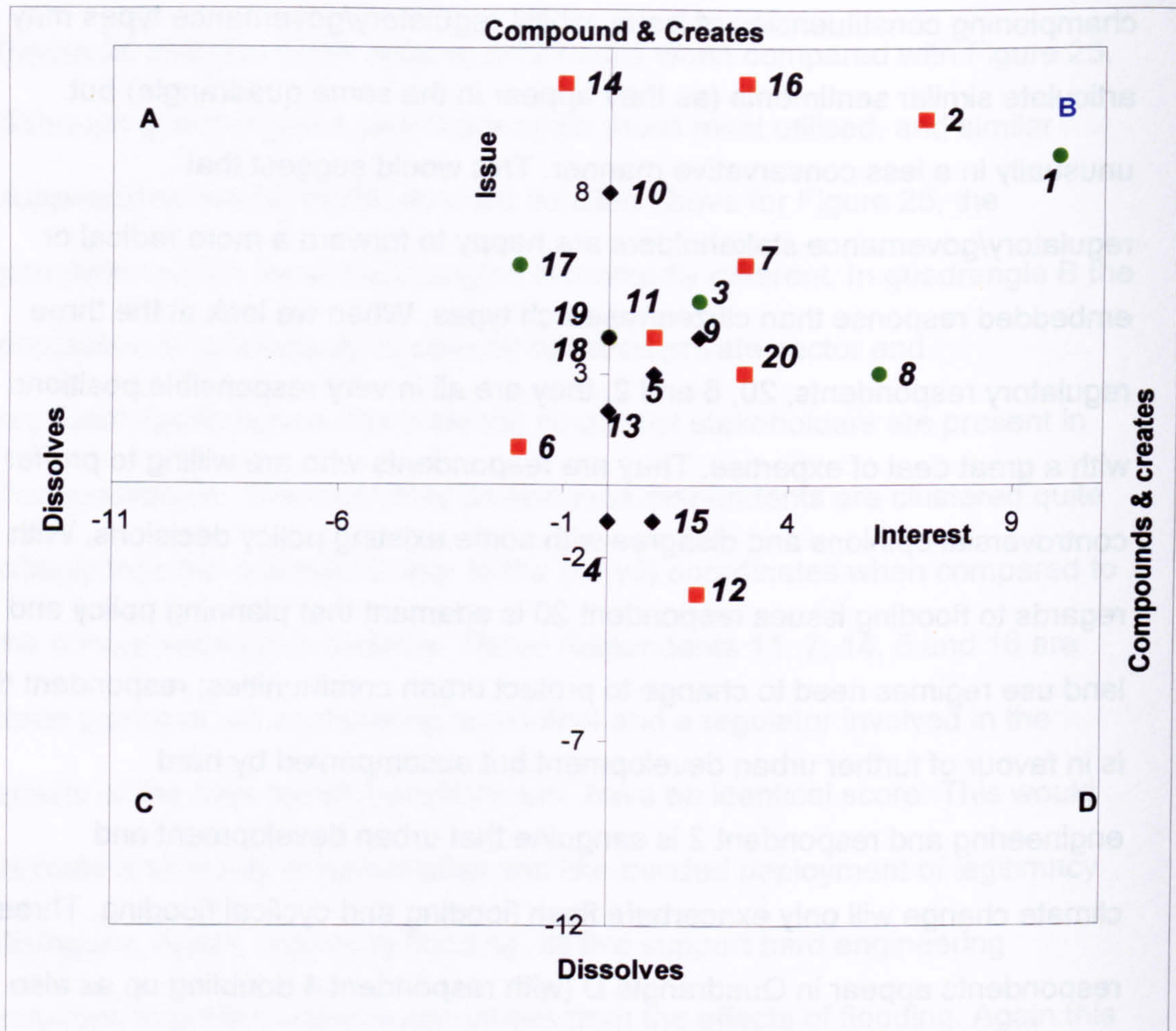


Figure 27: Regulators (red) Private sector (black) and activists (green) 'interest' and 'issue' legitimacy dialogues Milton Keynes quadrangle only

Comparing Figures 27 with 25 and 26 there is a great deal of difference in respondent's legitimacy dialogues distribution. Here the majority of response lies within Quadrangle B. Regulators/governance respondents have 5 stakeholder's here, the private sector 4 and activists proportionally the most with 3. In Figure 27, Quadrangle B, we can see that three of the private sector stakeholders lie along the 'y' axis (PT, TS and RT) which indicates legitimacy dialogues orientated around constituencies of issue but no presence of

constituencies of interest. Both the regulators and the activist groups have a wide dispersal in this quadrant. This indicates little consistency amongst the group and implies that the Milton Keynes issue prompts a wide variety of legitimacy dialogue response, with no common type of response predictable within this group. Respondents 16, a planner, and 2, a regulator, use the most extreme legitimacy dialogue. When looking to the interview detail, respondent 16 is in favour of the Milton Keynes development as favourable to more infrastructure and more jobs within the region whilst the regulator is sceptical that a full analysis of the municipal water needs of the region has been undertaken. This demonstrates that the use of LDs to create and compound constituencies does not tell us automatically if a respondent is in favour or against the scenario under discussion. Compared with the flooding issue we can see that the Milton Keynes issue prompts more disparity within groupings. Looking at Quadrangle A, the orientation is centred around the y axis, with legitimacy dialogues formed around constituencies of issue rather than commenting on those of interest. This would indicate that dialogues are issue orientated rather than having evolved into interest orientated regarding this specific subject matter of the Milton Keynes Quadrangle. Again, as with Figure 26, Figure 27 displays three representatives in Quadrangle D, with respondents 12 and 4 again represented, indicating that these two respondents articulate their legitimacy dialogues in similar and consistent ways even when discussing different scenarios.

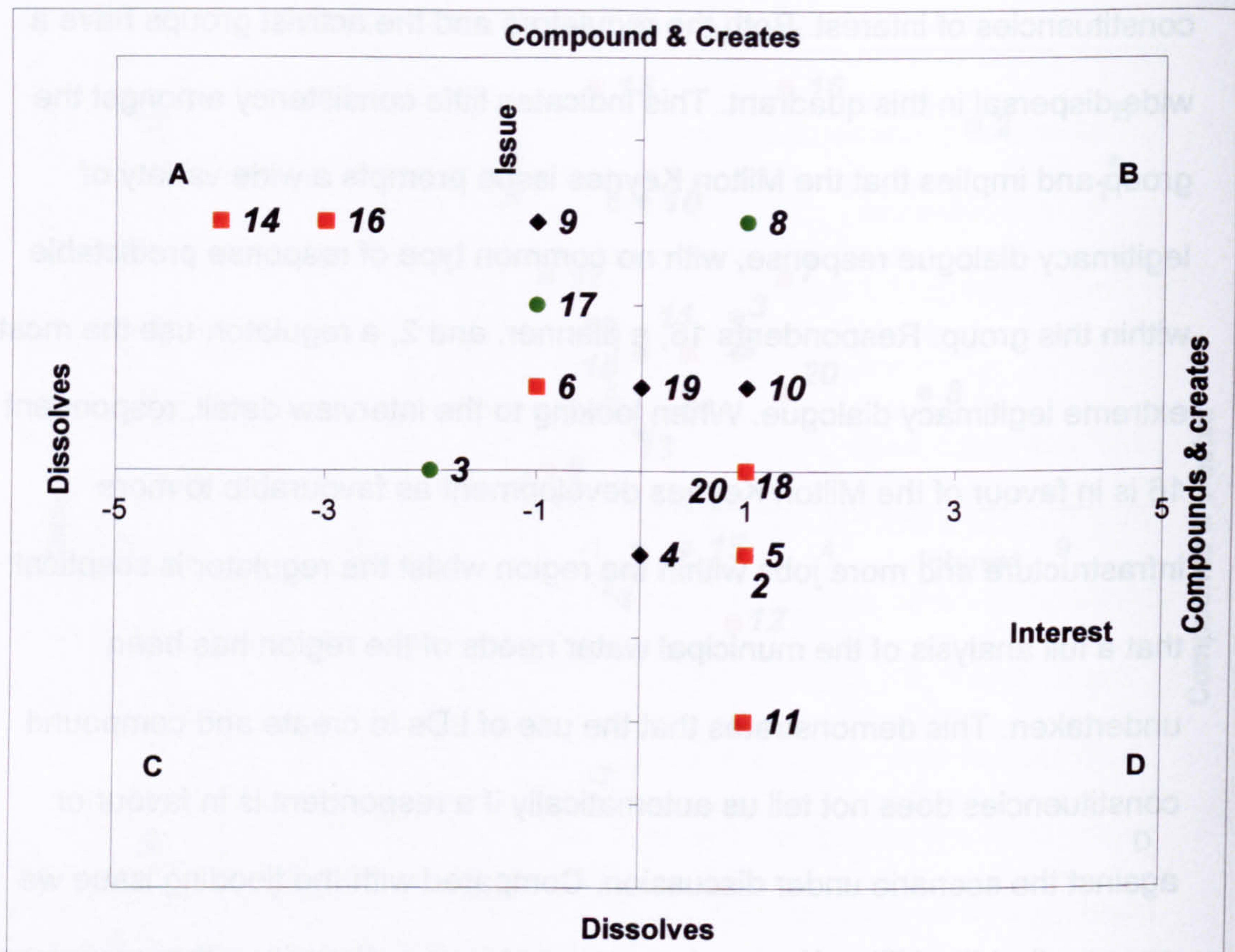


Figure 28: Regulators (red), private sector (black) and activists (green) 'interest' and 'issue' legitimacy dialogues legitimacy only (n.b. if respondents did not generate any legitimacy dialogue for this answer as a solo question they will not appear on the graphic).

Unlike Figures 26 and 27 which utilised 5 and 6 questions respectively, this graph only represents responses to one question and so will only be discussed briefly. Here response is much more scattered and distributed amongst the three most popular quadrangles, A, B and D.

Looking at the two opposite quadrangles, A and D, there is an equal distribution of regulators and private sector respondents and an almost equal

number of activists. This demonstrates that there appears no coherence between stakeholder types in their deployment of legitimacy dialogues. When we compare two extreme responses, respondents 14 and 16 with respondent 11 we see that all three are planners. 14 and 16 however demonstrated in their interviews that they are both keen to promote urban growth in their area whilst respondent 11 was keen to focus on the regeneration of the local high street rather than residential expansion. This difference in focus may explain the radical difference in the deployment of legitimacy dialogues.

Two sets of identical responses are noted, respondents 20 and 18, the MP and the conservation officer and respondents 5 and 2, the water supply regulator and the engineering consultant. Both these identical sets are within Quadrangle D which compounds constituencies of interest and dissolves those of issue. Obviously for respondent 20 legitimacy in decision making is crucial and for respondent 18 an involvement in decision making is a fundamental part in incorporating environmental issues into policy making. Both respondents 5 and 2 articulated during the course of the interviews that consultation and participation are needed for effective long term strategic planning, with respondent 5 referring to stakeholder 'buy in' and respondent 2 outlining a need for more consultation between policy makers and those institutions charged with deploying policy.

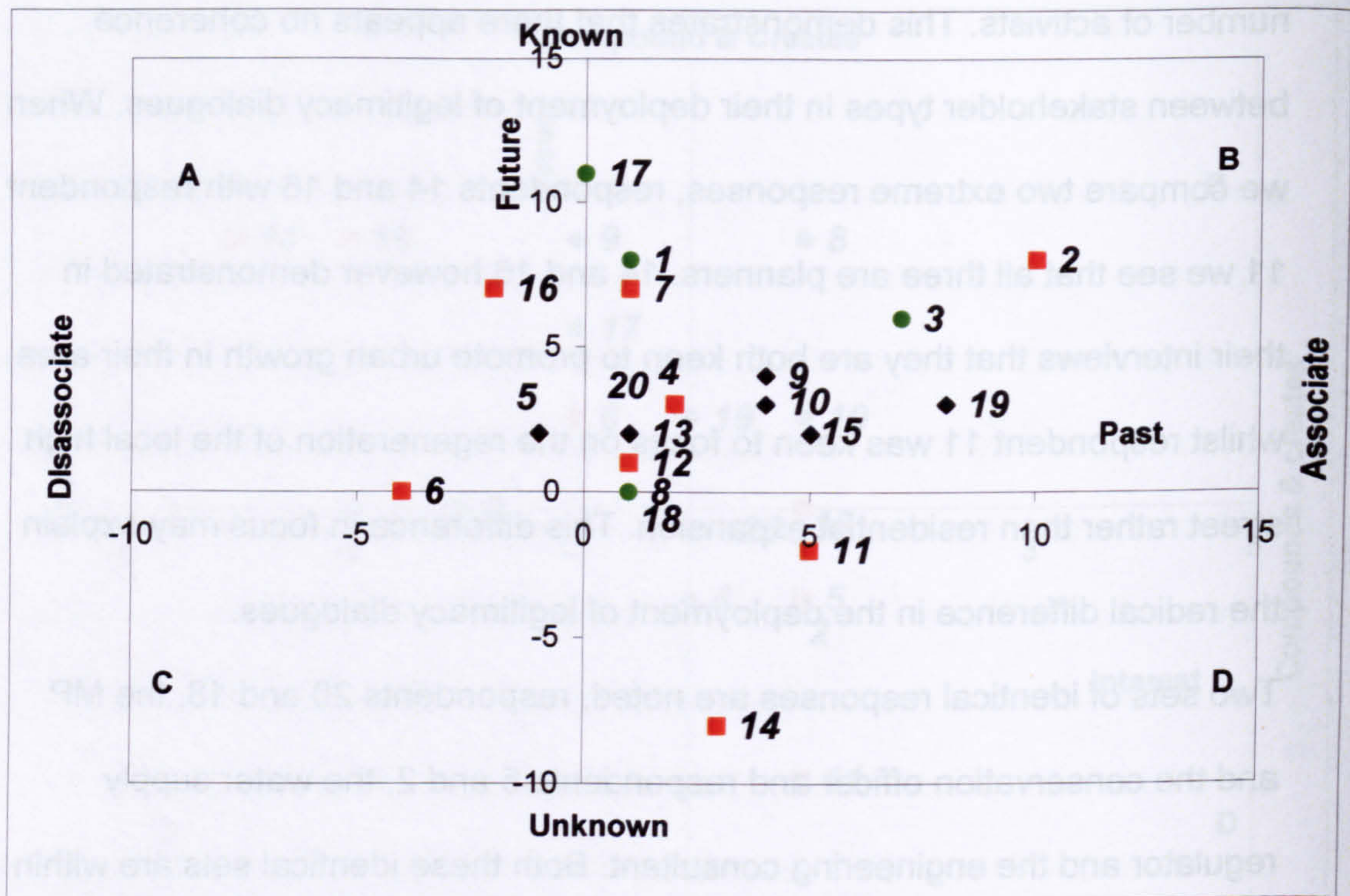


Figure 29: Regulator (red), private sector (black) and activists (green) 'past' and 'future' legitimacy dialogues combined

In Figure 29 the majority of response lies within Quadrangle B, with almost all the private sector stakeholders here, half the regulators and all the activists. As all activist stakeholders are represented within Quadrangle B it is possible to argue that the data shows that all legitimacy dialogues championed by these respondents orientate around an association with the past and move towards a known future. Four of the activist types (7, 1, 8 and 18 sharing the same co-ordinates) lie close to the y axis, with y co-ordinates of '4' and under. Although they are not clustered tightly together, there is a visible close association. This shows an affinity to associate more with the future than an affinity to articulate legitimacy dialogues which associate with the past. We

can say then that most legitimacy dialogues championed by citizen stakeholders in this set of paired dialogues are prospective; they associate with what will or might be. Respondents 8 and 18 share co-ordinates and they both articulated in their interviews a close association with the recent past. Respondent 8 in particular when discussing the floods of 1992 pinpointed past errors. Respondent 18 focused on changes to our environment over time yet this was articulated as the past was a better place than now.

Private sector respondents 9, 10 and 15 are clustered in Quadrangle B. Of significance is that these three respondents are all involved in farming; demonstrating that dialogues are formed around an association with the past rather than with the future.

Looking at the regulatory stakeholders there is a wide distribution across Quadrangles A, B and D, with four in A, two in B and two in D. Legitimacy dialogues that move towards an unknown future and disassociate from the past (Quadrangle C) have only one regulatory stakeholder, respondent 6. This respondent is a planner at a very senior level whose approach is inclusive, interdisciplinary and collegiate. The fact that respondent 6 is dispersed away from other regulatory stakeholders may reflect that he is one of few respondents from this group willing to work more closely with the civil service to develop policy that supports regional growth.

Quadrangle D has two respondents away from the x axis, two regulator stakeholders, 11 and 14, both planners. This orientation away from other

respondents is not clear from the data. In particular respondent 14 shows an affiliation to an unknown future – curious given that the discipline is involved in creating future growth.

The distribution of authority stakeholder responses is not significantly orientated around either axis, though the y axis is more favoured than the x axis indicating a propensity to build legitimacy dialogues around the future rather than the past. This general tendency for distribution across three quadrangles would seem to indicate that the regulatory figures have no definite orientation to use past or future legitimacy dialogues as a way of grounding a response. Yet the private sector respondents are almost all within Quadrangle B and orientated towards associating with the past. Why this should be is not clear, but is a definite trend.

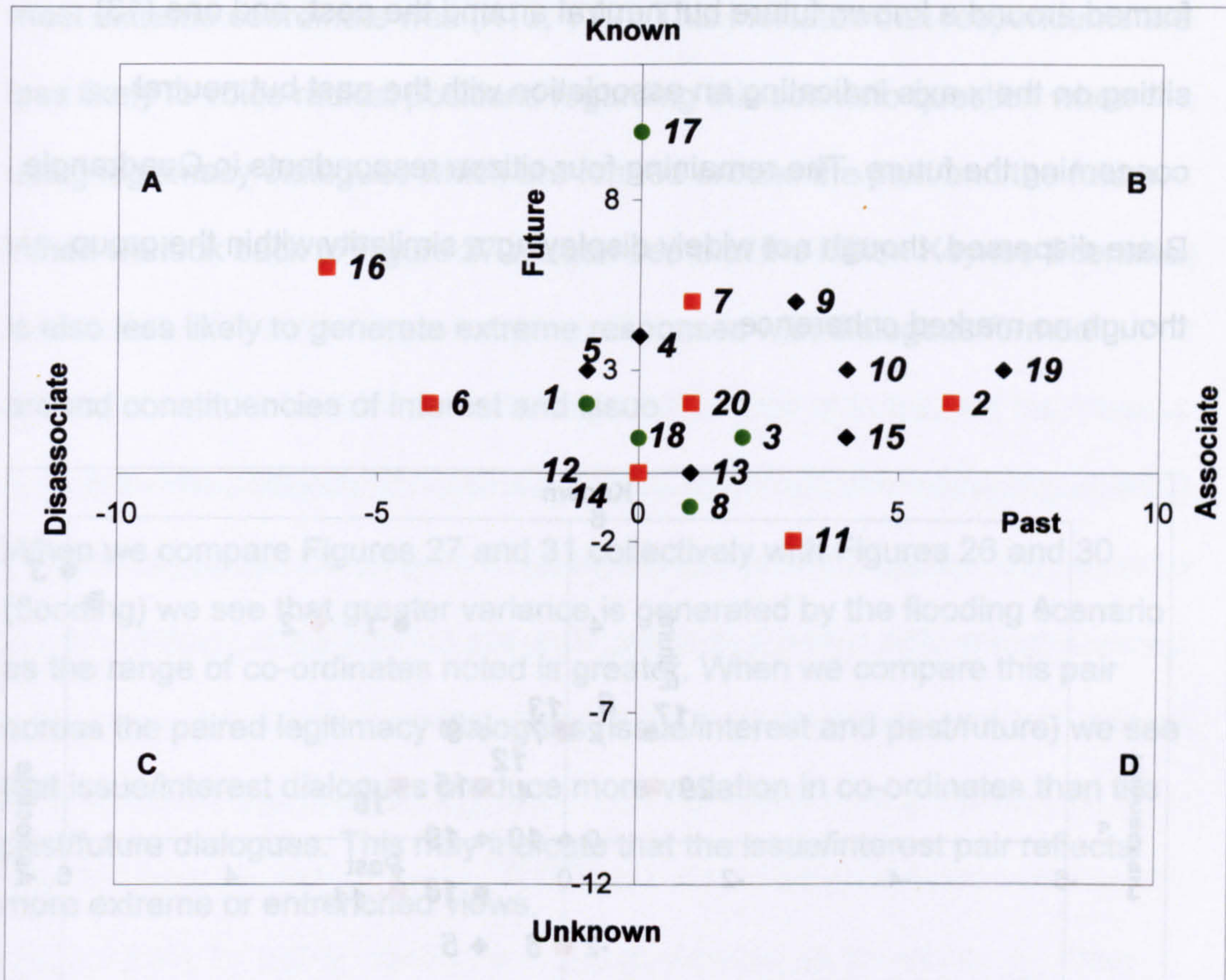


Figure 30: Regulators (red), private sector (black) and activists (green) 'past' and 'future' legitimacy dialogues flooding only

As with previous figures, Figure 30 illustrates that legitimacy dialogues dominate quadrangles A, B and D and are absent in quadrangle C. Again, this indicates a propensity across all respondents to articulate legitimacy dialogues in generally positive, constructive ways. Again as with Figure 29, there is a propensity for private sector stakeholders to orient legitimacy dialogues within quadrangle B, with six out of seven respondents here. Just over half of the citizen types are orientated in this quadrangle along the axes, with three (17, 4 and 18) sitting on the y axis indicating legitimacy dialogues

formed around a known future but neutral around the past, and one (13) sitting on the x axis indicating an association with the past but neutral concerning the future. The remaining four citizen respondents in Quadrangle B are dispersed, though not widely displaying a similarity within the group though no marked coherence.

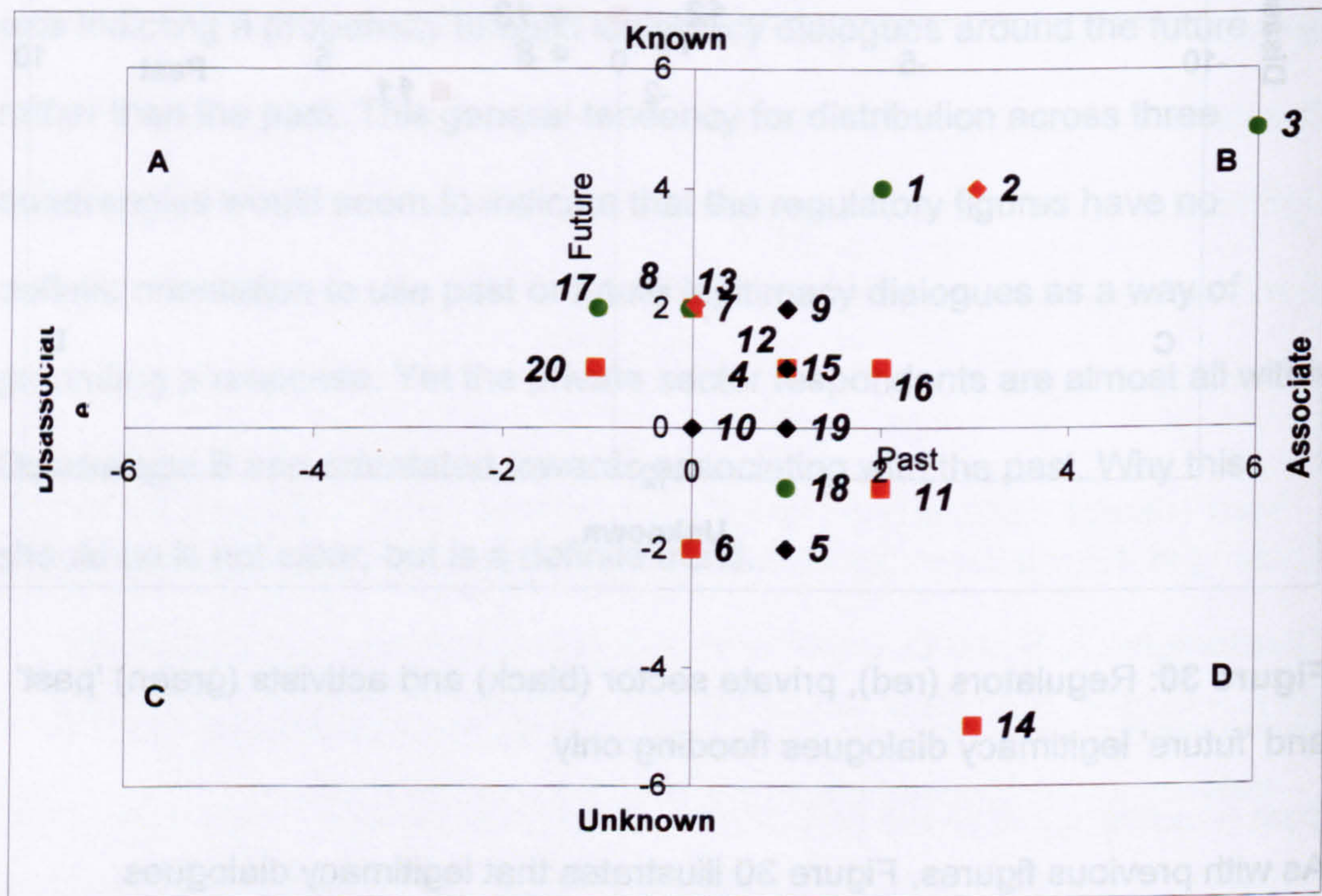


Figure 31: Regulators (red), private sector (black) and activist (green) 'past' and 'future' legitimacy dialogues Milton Keynes Quadrangle only

Looking at past and future legitimacy dialogues in response to Milton Keynes development questions, (Figure 31), we can see a marked difference compared with earlier figures (Figures 25 through to 29). In Figure 31 all respondents are orientated around (X0, Y0) with the most extreme coordinate of respondent 3 with (X6, Y5). We can compare this with Figure 25 when the

most extreme coordinate was (X13, Y19). This indicates that respondents are less likely to voice radical positions regarding this scenario question when using legitimacy dialogues which are formed around the past and the future. When we look back to Figure 27 we can see that the Milton Keynes Scenario is also less likely to generate extreme responses with dialogues formed around constituencies of interest and issue.

When we compare Figures 27 and 31 collectively with Figures 26 and 30 (flooding) we see that greater variance is generated by the flooding scenario as the range of co-ordinates noted is greater. When we compare this pair across the paired legitimacy dialogues (issue/interest and past/future) we see that issue/interest dialogues produce more variation in co-ordinates than the past/future dialogues. This may indicate that the issue/interest pair reflects more extreme or entrenched views.

The Legitimacy dialogue orientation in Figure 31 is based around Quadrangles B and D, which is markedly different from other figures, where the orientation is Quadrangles A and B. This B/D orientation demonstrates a general tendency to articulate legitimacy dialogues which associate with the past, but with variance of response towards the future. Looking at Quadrangle B first, the majority eight citizen types are within Quadrangle B compared with six authority types. Both groups show a remarkably similar pattern of distribution in this quadrangle, with several sharing the same co-ordinates. This pattern reflects that both groups construct their legitimacy dialogues with regards to the Milton Keynes development scenario in near identical ways. Looking at Quadrangle D, five authority types are represented (TY doubling

up) compared to only two citizen figures (PT doubling up). This reveals that authority stakeholders are much more likely to build dialogues constructed upon an unknown future than are citizen stakeholders. This circumspection by authority figures may demonstrate willingness by authority figures to pursue ambiguity as a response to change. There is one significant outlier in this quadrangle, the authority figure RW, who is a planner for a local council. Quadrangle A has only one respondent not sitting on the y axis, who is a citizen figure, whose response disassociates from the past but moves towards a known future. This is of interest given that the respondent is involved in research which can contribute to government policy.

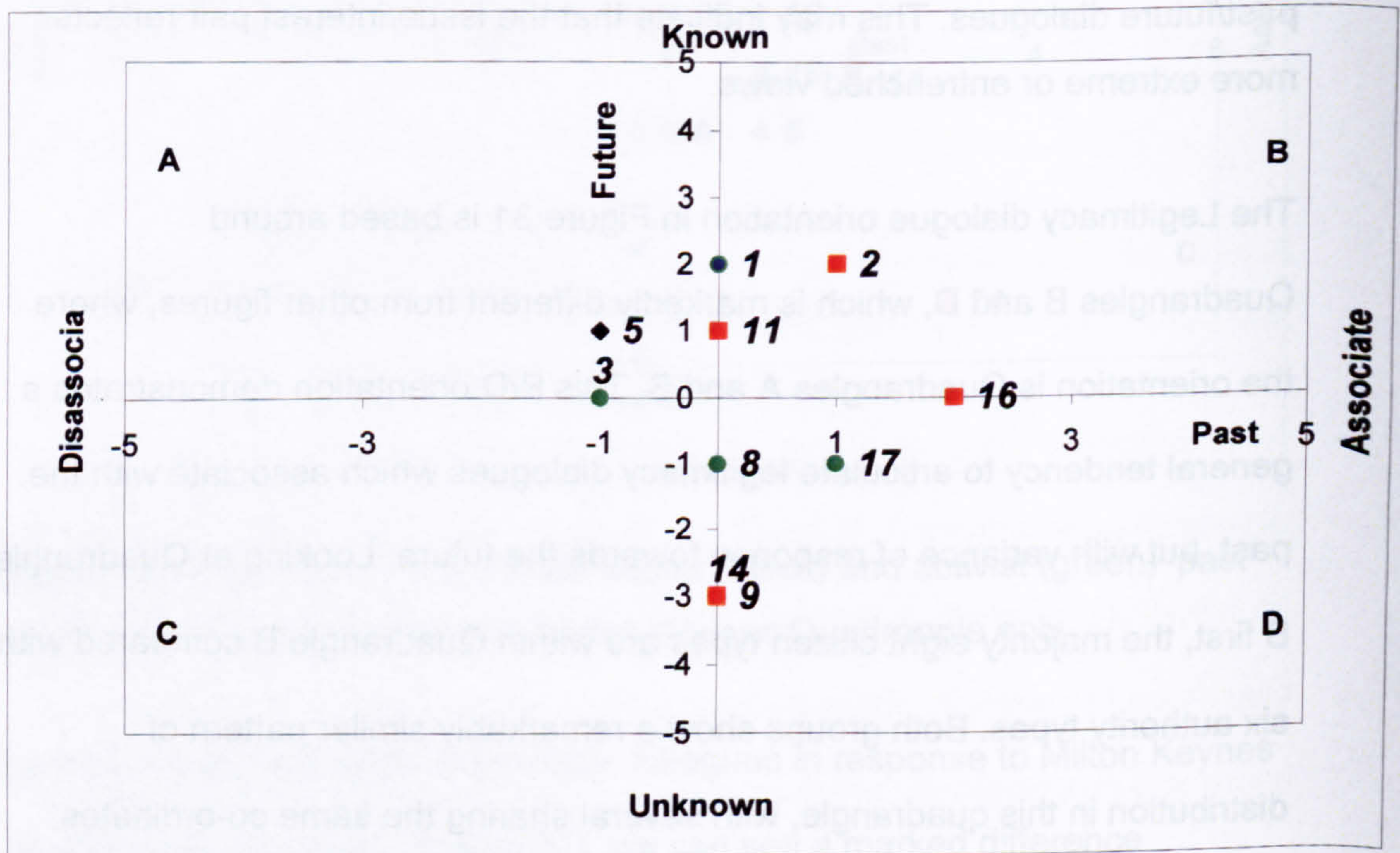


Figure 32: Regulators (red), private sector (black) and activist (green) 'past' and 'future' legitimacy dialogues legitimacy only (n.b. if respondents did not generate any legitimacy dialogue for this answer as a solo question they will not appear on the graphic).

Unlike Figures 30 and 31 which utilised 5 and 6 questions respectively, this graph only represents responses to one question and so will only be discussed briefly. Here, overall response is lower compared with all other questions with only four regulatory figures, two private sector respondents and four activist respondents providing legitimacy dialogues – half of the overall interview population. Of the three groups the activist stakeholders have the highest representation with 80% responding to this question compared with 57% for regulators and only 25% for private sector respondents. This would seem to indicate that legitimacy is an issue of interest for activist respondents and of less importance for the private sector. It is of interest that it is a concern for only half of regulators and governance respondents. Why this may be is hard to speculate without further research but may be connected to issues of responsibility for policy creation and implementation as two out of the three regulators interviewed responded and their LDs sit in Quadrangle B, whilst two out of the four planners' LDs sit in Quadrangle D. Five respondents sit on the y axis, demonstrating an affiliation with dialogues which associate with future, either known or unknown, but do not associate with the past. There are no significant outliers.

7.10 Discussion

The high response rate to the research questions in this structured interview fieldwork illustrates that all three respondent groups are well informed, interested in the nature of the research and willing to take part in discussions

concerning water resource management within the River Nene catchment. The research has found evidence that legitimacy dialogues are present and are used when respondents answer specific questions concerning water resource management issues. Data analysis has demonstrated that when comparing respondent's legitimacy dialogues by respondent or by scenario, none of the models created are identical. This suggests that although we can validate the presence of legitimacy dialogues we cannot predict, or model, who will use them or how. However, looking at the cluster models of legitimacy dialogues (Figures 25 – 32) it is possible to say that responses to questions are generally constructed around positive statements, i.e. there were no negative-negative legitimacy dialogues, if present these would be found in Quadrangle C of the cluster models.

Looking at the interview response, most appear informed and interested in the research, with a low figure of non response to questions. Also, out of the original 30 invitees asked to participate there were 22 positive responses (as stated previously, one was unable to contribute due to ill health, another declined after reviewing the interview question). From the original sample two thirds accepted, which is a high response rate for qualitative fieldwork. Upon reflection on the work involved conducting and then analysing the interviews, any more respondents than the 20 interviewed might have threatened the research time available to usefully utilise the data.

The analysis stage revealed little similarity within the three groups themselves, suggesting particular specialised knowledge of each individual respondent. Content analysis does not reveal distinct groups or even subgroup types. As detailed in Table 11, using the general stakeholder category of 'water user' and 'governance body' rather than the three respondent group types utilised in this chapter may be more pertinent given the lack of similarity of perspective within the three groups. Returning to the overall thesis questions in this latter part of the section may help shape the discussion of results in a more accessible way.

Research Questions
1. What are the different needs and expectations of water users and governance bodies in relation to their existing use of the River Nene catchment?
2. Is legitimacy present or absent in current relationships between water users and governance bodies along the River Nene corridor?
3. Can strengthening legitimacy enable a broadening in response envelopes to allow for more adaptive policy tools to cope with water stress?
4. What policy options to combat water stress are water users and governance bodies willing to consider?
5. Are the institutions, organisations, agencies and bodies responsible for the governance of water resources and water services in the River Nene catchment potentially adaptive to water stress?

Research Question 1: *What are the different needs and expectations of water users and governance bodies in relation to their existing use of the River Nene catchment?*

Within this piece of research it is not possible to discern what the needs of any of the respondent groups may be. Need was not specifically addressed as a question. It is possible to discern from an organisational perspective what is needed in order to achieve an institutional goal, but this may have no bearing in terms of what is useful in terms of use within the catchment. Looking at freshwater use, it is the water users who have a 'need', rather than the governance bodies. These needs were not discussed in the interviews as it is self-evident from the type of respondent what needs they will have e.g. waterways users want access to navigation at an affordable price; farmer's groups need water for abstraction and/or irrigation and environmental groups wish to ensure a natural habitat is maintained or restored for wildlife. The response to this question will focus thus on the expectations of the governance bodies and water user groups, as expectations can change according to what is deemed feasible or probable.

Looking generally at the responses of the governance bodies, expectations centre on the continuation of the Environment Agency within its present operational role. There is also great support for the continued use of hard engineering to manage the river. There is little or no discussion of the Water Framework Directive, or indeed holistic catchment planning. Diversity of opinion exists regarding the potential benefits of the Milton Keynes development. Benefits and costs seem to be highly localised with no governance body able to project a catchment wide perspective. Improved

consultation was highlighted as an expectation, but this seemed to be directed more towards organisational communication rather than as a direct benefit to the management of the river. Only governance body stakeholders mentioned secure water supply as an expectation, demonstrating that water stress remains a low priority, low visibility issue.

For water users, expectations are linked not with a vision of the river but ways in which they can improve their organisational impact on governance bodies. Direct action was not portrayed as feasible. This seems to be because of the way the river is managed by the regulators, leading user groups to either be delegated tasks through contract, or offered the opportunity to contribute to policy changes through consultation (such as the Nene CAMS process – see www.environment-agency.gov.uk). Expectations are then reliant on relationships with regulators. The user groups have individual concerns about the river (loss of navigation rights, effluent problems due to summer low flow, carrying capacity of the river, excessive nitrate levels effecting fauna) but expectations are geared around the governance bodies providing solutions.

This leads to an asymmetry between water users and governance bodies, as water users feel they have limited impact on policy, and governance bodies are reliant on policy formulators at regional and national level to direct their remit of work. There seems to be little empowerment of regulators or water users at the catchment level. Regulators must adhere with policy directives, water users must adhere to predetermined access strategies such as

attendance at planning meetings or membership of consultation boards. Given that this research is catchment based, no commentary can be made about policy formulation at national or EU level.

Research Question 2: *Is legitimacy present or absent in current relationships between water users and governance bodies along the River Nene corridor?*

The design of the interview questions intentionally precluded the use of the term legitimacy in the written interview questions. This was to determine if respondents would voluntarily use the term. The legitimacy question was then added on at the end of the interview, and not given to respondents prior to the interviews unlike the other questions, so that the issue of legitimacy could be specifically addressed without any premeditated answer. As a result, the term 'legitimacy' or 'legitimate' was never voluntarily used in response to either the flooding or Milton Keynes development scenarios. This result could infer that legitimacy is simply not an issue for any respondent type. One interpretation of this could be that there is a general acceptance within both stakeholder groups that the current framework does a competent job within the context of policy and funding restrictions.

Isolating the responses of governance bodies within the interviews, it is arguable that their focus is directed towards policy implementation and planning cycles; water users are not often referred to as a group which affects day to day operations. This would seem to indicate that relationships between

the two respondent groups are stable, functioning and operating within clearly defined spheres. At the time of the research there were no high profile action groups operating within the catchment which could have an affect on the cordiality between the two groups. Given that one of the aims of this thesis is to understand relationships between the two respondent groups before water stress becomes a problem, it is possible to infer that the issue of water stress is of a very low profile within the catchment. This appears to lead to an acceptance of the current management regime for the River Nene catchment.

Turning to the water user groups, there seems to be no overarching concern that unites them, or which could, as a respondent group, lead them to feel that general water governance policies were either illegitimate or untrustworthy. The responses to the interview questions provided by the user groups build up a picture of individual organisations operating in separate spheres that only come together physically when stakeholder affiliations are artificially constructed by governance bodies, for example in the case of the Nene CAMS process. There is no uniform user group identity and the issues they each seem to address, whilst bearing similarities, have marked differences. For example, whilst all argue the need to maintain and encourage public access to the river corridor, and advocate the need for a healthy river, the waterways group is concerned with navigation rights and the restoration of waterways for boaters, environmental groups focus on safeguarding wildlife and the fulfilment of national and EU guidelines on the environment and farmers groups seek to champion farmers rights and secure their business

interests. As a result, these groups champion different positions; issues of illegitimacy or mistrust do not develop as major themes. In turn, governance bodies appear to view water user groups at the catchment level as self organised and credible and will engage them in participative approaches. It could be argued that only by spending more research time looking more closely at the relationships within and between these groups can definite patterns of communication be identified; however, this was not possible within the remit of this thesis.

Research Question 3: *Can strengthening legitimacy enable a broadening in response envelopes to allow for more adaptive policy tools to cope with water stress?*

From the water user group's perspective the interviews seem to support this hypothesis. One respondent from an environmental group stated that in the past they had been happy to offer governance bodies advice and prepare strategy documents, but that as a result their opinions were unused and no 'added value' environmental perspective was added to the final policy decision. However, if guaranteed some useful input the group would provide assistance again. This could be one area where by improving communication routes more 'win-win' solutions could be generated in terms of any adaptive policy, not just those linked to water stress.

The response by a number of planners in support of sustainable urban drainage (SUDs) proposals for new building developments reflects a cultural shift which is more accepting of softer engineering solutions. This demonstrates that dominant tried and tested ways of achieving outcomes is replaced in favour of more open minded, inter-disciplinary approaches. SUD approaches in particular can contribute to reducing urban water stress by capturing more water on site to trickle down slowly through green spaces and balancing ponds before joining the river network, slowing down flash flooding in heavy rain and providing a year long supply of water for residential open spaces, rather than domestic users relying on potable water for garden watering.

The interviews do seem to indicate that adaptive, pliable and innovative policy tools certainly seem to be favoured by both stakeholder groups in a move away from supporting draconian, static or 'old-fashioned' policy. Farmer's groups stated that they were happy to embrace new EU environmental stewardship policies; even though they felt that the industry had only just adapted to the productivity orientated policies of the 1980s CAP reforms. They claimed that as an industry, farmers were willing to embrace change, though it takes time to shift the predominant culture, and that no new policy will succeed unless it can be seen to be profit orientated.

The response from the policy researcher demonstrated that policy flexibility is needed to respond to uncertain futures. Again, although legitimacy was not

specifically named as the bedrock for the adoption of more adaptive policy solutions to water stress, the inference generated by the interviews is that better communication and more common sense solutions would make policy makers and water managers appear more credible and responsive.

These approaches are viewed as assets which create a positive feedback loop for the generation and maintenance of legitimacy. This 'invisibility' of legitimacy when relationships are either working or at least deemed acceptable, accords with the issues of 'input' and 'output' legitimacy highlighted in Chapters 2 and 6. The research in this thesis has made an important contribution by demonstrating that legitimacy's presence is marked by its virtual absence from social life and from state-citizen relations. Attempting to empirically document this is then a difficult task, in which inference plays a major role.

The interviews seem to suggest that legitimacy is a term kept for organisations rather than for individuals within organisations. At no point in the interviews do any of the water user groups specifically identify an individual they feel is responsible for change or innovation – either negatively or positively. Legitimacy seems to be tied with efficiency and effectiveness, policy clarity and deployment and, in the final instance, with long term vision. This is illustrated with the general support shown for the Environment Agency which now, several years after its inception, seems to have gained credibility.

The interviews also indicate that consultation processes and stakeholder participation seem low in the list of ways of building legitimacy or credibility. This is likely to have a significant impact on the ability of the WFD to satisfy some of its goals, at least within the English and Welsh water management context. A useful piece of research that could be attempted in the future would seek to target how respondents define legitimacy and isolate how it is deployed, exploring issues of participative democracy.

Water governance bodies seem to be somewhat constrained in adopting innovative and adaptive policy models. Their interview responses identified issues such as carrying on the work from predecessors, promoting risk reduction, the limitation of funding constraints and staff capacity plus senior management leadership style and the caps on change wrought by five year planning cycles. For water governance bodies along the River Nene catchment it does not seem to be a case of what water users will accept, as much as what policy makers will allow. Water user groups are identified as having to be 'brought on board' with policy, but this seems to be in order to reduce transaction costs rather than to enable policy to be deployed. The upward chain of communication seems sluggish – innovation does not appear, on the basis of these interviews, to develop in the catchment.

Research question 4: *What policy options to combat water stress are water users and governance bodies willing to consider?*

As detailed, this research activity specifically limited the term 'water stress' as a means to capture if there is recognition of the phenomena within the catchment.⁷⁹ Instead two water stress drivers, flooding and rapid urban development were used to gauge responses to water stress problems. Unlike the results from the household questionnaire in Chapter 5, there is no question in this fieldwork that can directly answer this research question. However, it is possible, and useful, to look at the types of response provided to the drivers of flooding and rapid urban development.

The flooding responses fall into two categories; those who view flooding as a cyclical and so 'natural' event, and those who view it as a product of anthropogenic influence within the catchment. These views do not neatly fall within each respondent group; instead there is a great deal of crossover. This in itself informs the research that there is not necessarily a clear distinction between either stakeholder group. Instead it is necessary to look at the perspective of the organisation. For instance, when asked to think about solutions to flooding (Table 10, question 2, flooding) planners divided into those who opted for hard engineering, others who opted for soft engineering and those who believed it was solely the Environment Agency's responsibility. This variety in response is also true for water users responding to flooding questions.

⁷⁹ Water stress was mentioned in the interview invitation letters and verbally at the beginning of the interviews, but was not included as a specific term in the interview question list.

This shows that there is no disciplinary position; which implies that providing generic policy solutions to water stress from a regional to a catchment level could lead to legitimacy problems. When asked who should provide policy solutions the planners all selected a mix of organisations with diverse areas of expertise. Again, it is possible to infer that consensus amongst institutions is seen as the most appropriate method for policy delivery; implying that legitimacy resides amongst a range of organisations, not just the water regulators who are generally responsible for developing and implementing policy.

When looking at responses to rapid urban development, the range of policy options selected were very different. Unlike flooding, which generated a high response rate, the Milton Keynes Quadrangle scenario lead to fewer responses. These responses also articulated a very specific vision horizon, both in terms of discipline and geography. Respondents from both stakeholder groups related impacts only to their specific area of expertise and appeared to be unable to see likely ramifications of rapid urban development upon the catchment. Policy solutions generated by respondents were narrow and particular, unlike flooding responses.

What differentiates the two water stress scenarios is that flooding has been experienced at different scales by the majority of respondents along the catchment. As the River Nene corridor is mainly rural, the rapid urban

development scenario is an unknown and novel phenomenon. In terms of the thesis, it may be conjectured that coping with new phenomena is marked by insularity; actors can only visualise in terms of how they might be immediately affected. It would be wrong to speculate too much on this facet of the results, but again leads to a wider set of research questions which future enquiry could benefit from addressing.

Research question 5: *Are the institutions, organisations, agencies and bodies responsible for the governance of water resources and water services in the River Nene catchment potentially adaptive to water stress?*

This was always going to be the most challenging of the research questions to answer; but still a useful and insightful question. What is certain is that it is impossible to fully answer it with little or no experience of how water stress manifests itself. However the scenarios were a useful way of allowing respondents to talk about possibilities and allow them to envision marked changes in conditions of water quality and water quantity within their catchment.

The interviews demonstrated that for the governance bodies, flooding was the easiest scenario to answer of the two, given recent past experience and the policy changes that were resultant from post hoc reviews of flood response. Responses emphasised a movement in perception away from flood management and towards risk management; an acceptance that not all

flooding events can be predicted or avoided. This new approach is linked closely with adaptivity as there is a general acceptance that full control over nature is impossible and instead flexibility of policy and response is needed – and by inference that policy subjects will also have to be educated into viewing flooding as not wholly controllable. This need to adapt to emergent situations is also reflected in the entry of SUDs into the lexicon of authority stakeholders. SUDs are viewed as part of a new solution mix. The fact that there is a solution mix of which SUDs is but one element, points to a flexibility of approach which is a hallmark of adaptivity. Riverine and flooding events of the past twenty years seem to have a significant bearing on an altered language for governance bodies and the types of forecasting devices used. Responses also indicate a need to develop ‘joined-up’ government, though the DEFRA respondent indicated this was very much subject to political whims. The WFD seems to play little part in the common vocabulary – only operating at policy development level in DEFRA and operations level in the EA.

It is possible that this central hold on policy vision severely curtails adaptivity at the catchment level. The interviews seem to indicate a general feeling that bureaucracy slows response and blocks local knowledge of what works and doesn’t work along the catchment. What was clear from the interviews was the need to emphasise that catchments may have hydrological characteristics, but that responses to different drivers and stimuli are all very different. Catchment planning provides an opportunity to accommodate this, but only if

policy is flexible enough to empower the stakeholders at catchment level to fully utilise their knowledge and expertise.

Turning to the Milton Keynes Quadrangle scenario, only the water company representative voiced worries concerning negative effects on water supply.

These fears are not reflected in the planners' vocabulary, which were orientated around the creation of infrastructure and restoration of local economy hubs. These differences in response would seem to indicate localised spheres of operation. The possibility that rapid urban development of this type may generate water stress 'hot spots' does not seem to be entertained by governance bodies, not even at the DEFRA level. Responses still centre on flooding rather than other types of event such as drought, declining water quality or a public health scare. One must be sceptical as to whether this response is generated because floods are still fresh in the institutional or collective memory, or whether this is a fieldwork flaw, in that because flooding was used as the first scenario respondents assume that all other responses should be connected with flooding. An attempt to safeguard against this was made by the researcher in both the invitation letters (see Appendix 3 and Appendix 4) and at the beginning of the interview when it was verbally stressed that the scenarios were selected for their accessibility to demonstrate water stress rather than for their individual importance per se.

Returning to the interviews, when determining if water users feel governance bodies are adaptive, there is a common theme to answers which

acknowledges the great leaps the Environment Agency has taken to become more effective as an organisation. This includes developing better relations with other organisations. Yet this does not indicate a general view that the EA has become more adaptive; instead the general perception seems to be that the EA is moving from a 'lessons learned' perspective, rather than one which is moving towards innovation in policy deployment and operations management. It is likely that solutions to extreme changes won't be developed at catchment level; the government ministry of the Civil Contingencies Unit⁸⁰ is a more likely candidate. This national-level scale of operations is outside the remit of this piece of research. Certainly the Milton Keynes Quadrangle scenario is predominately viewed by water users as having a highly localised effect on the catchment – in stark contrast to the water company which has to think creatively outside the catchment to cater for expected increases in peak demand as a result of the development. Again, the WFD is not volunteered by any of the respondents as a key influence on future planning perspectives. The fact that it is already operational does not seem to be generally recognised.

7.11 Conclusion

The interviews have provided a wealth of new data from a catchment perspective. Returning to the title of the thesis '*The role of legitimacy in the relationships between water users and governance bodies under conditions of*

⁸⁰ The CCU is the government office whose remit is specifically to plan for unusual, extreme or emergent events which threaten national security www.ccu.gov.uk.

increasing water stress' it is now possible to make some new informed comments. The first relates to the concept of legitimacy itself. The theoretical place of legitimacy in modern political economies is to explain the justification of authority. Legitimacy is also presented as constantly open to contestation and renewal. One aim of the interviews was to move from this abstract concept to something more tangible, and to ascertain how legitimacy operates at the catchment level between water users and water governance bodies. The interviews suggest that legitimacy dialogues can be located in the responses to the interview questions. Respondent's overall tacit acceptance of the institutional status quo highlights that the current system of operations works – albeit with flaws.

Responses also seem to indicate that the perception of legitimacy is generated by people within institutions, rather than through the institutions or policies themselves. Often respondents would name a person who galvanised response or championed change and this would lead to their organisation being viewed with those same characteristics. Instead, institutions are viewed as credible, effective, efficient and accountable; their legitimacy is never questioned.

The emphasis at catchment level seems to be on output legitimacy – how policies are deployed, the ways in which lessons are learned and the strategies necessary to communicate policy changes. Little emphasis is placed on input legitimacy; no new institutions are demanded or new

managers called for. There is then no wish to reinvent the status quo or return to some ideal past. When questioning how water stress may affect legitimacy relationships, it can be surmised that for governance bodies, emphasis must be placed on ensuring that output legitimacy is strengthened.

From an alternative perspective, authority stakeholder's views of water user groups do not specifically refer to legitimacy. Yet neither is any group viewed as illegitimate, out of place or ill informed. Rather, the general opinion seems to be that to reduce the transaction costs of rolling out policy there needs to be stakeholder 'buy-in'; whilst user groups are seen as 'legitimate' representatives of stakeholders they will continue to be involved and consulted. Maintaining a generally coherent status of representativeness, and hence being viewed as legitimate, seems to be the most effective way that citizen stakeholder groups can influence policy development.

The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

Chapter Eight: Discussion

8.1 Introduction

The core aim of this work has been to provide new insights into the operation of legitimacy between water users and water governance bodies.

Understanding the role played by legitimacy may make it possible to envisage the development of strategies, procedures and policies that assist in reducing the impact of water stress. However, the thesis does not attempt to catalogue the types of strategies, procedures or policies that should be operationalised.

Its focus is on understanding the operation of legitimacy networks and elaborating on whether an appreciation of these networks could assist in reducing the transaction costs and time lags associated with exploratory or novel technologies of change.

To clearly define the parameters of the thesis' remit, five meta research questions were posited:

Research Questions
1. What are the different needs and expectations of water users and governance bodies in relation to their existing use of the River Nene catchment?
2. Is legitimacy present or absent in current relationships between water users and governance bodies along the River Nene corridor?
3. Can strengthening legitimacy enable a broadening in response envelopes to allow for

more adaptive policy tools to cope with water stress?

4. What policy options to combat water stress are water users and governance bodies willing to consider?

5. Are the institutions, organisations, agencies and bodies responsible for the governance of water resources and water services in the River Nene catchment potentially adaptive to water stress?

This chapter will review each of these questions and ascertain the extent to which the thesis has been successful in producing answers and satisfying the research aims.

The opening section of this chapter, 8.2, is dedicated to a critique of the approaches utilised by the research and an assessment of the appropriateness of the strategies adopted. This is accompanied by a reflection on which, if any, alternative options may have been more beneficial for the satisfaction of the thesis' aims and objectives. The following sections, 8.3 to 8.4, review the methods used within the research and assess the reliability of the data generated by the research methods, to ensure that any conclusions are both robust and accurate.

Sections 8.5 to 8.9 present a review of the findings of the research and a return to the current literature explored in the thesis. Section 8.10 goes on to argue both for the relevance of the thesis' findings and its success in addressing some of the knowledge gaps identified in Chapter 2. Having addressed the knowledge gap the chapter concludes in Section 8.11 by

reviewing the overarching research questions, and assesses how well they have served the objectives of the thesis.

8.2 A critique of the approaches utilised by the research

The thesis made the acquisition of new research techniques by the author essential. Coming from a background in political science, the author's analytical approach originally favoured the analysis and contextualisation of policy documents, publicly available texts such as opinion polls, surveys and examples of political action. However, the exploration of a key political and philosophical concept as legitimacy within a natural resource management context required the development of empirical fieldwork skills. As the fieldwork entailed both survey work and interview work this led to a steep learning curve of new skill development. Learning these new techniques inevitably used up research time.

A possible consequence of this rapid learning phase may have been the exclusion of alternative analysis techniques. The researcher has tried as far as possible to eliminate error and explore all avenues of data analysis.

The household questionnaire used the SPSS V11.0 software system. There may be alternative statistical analyses that could have been exploited.

However, given the parameters of the research the use of this package was not unreasonable.

The breadth of the thesis also needs to be considered. Utilising aspects of political science, philosophy, policy, sociology and natural resource management, the cross disciplinary emphasis within the thesis has meant that a lot of research time was spent on finding common ground amongst these subject areas. Empirical fieldwork choices were possibly constrained by trying to satisfy the needs of each discipline and yet find commonality amongst them. However, limiting the scale of the fieldwork research to a single river catchment prevented a loss of focus. Further research could make use of the data generated by this project by undertaking a comparative analysis within another catchment in England and Wales, or broadening the scope of the research and comparing a characteristically similar catchment in another country.

The thesis objectives explored how it may be possible to develop technologies that enable adaptation of institutions under conditions of increasing water stress.⁸¹ As water is a natural resource, the research also had to be aware of the impact of future climate change. However, climate change research as such is outside the remit of this thesis. This thesis has thus tried to balance the various scientific opinions and data that are currently available (Lomborg, 1998; Arnell, 1998). A lengthy discussion of climate change in relation to the results might have benefited the thesis but risked drawing the focus away from empirical findings and methodological conclusions. As a result, the

⁸¹ Technology here is used in its widest sense of tools, policies and strategies.

author has decided to keep a wider discussion of climate change for future work.

Another possible criticism of the thesis is that although water stress is discussed at length within the research, no work has been undertaken to identify the present government's position on water stress. There seems to be no overt policy position concerning water stress from DEFRA. This has led the thesis to take the position that water stress is not on a national political or policy agenda. The thesis has not examined government policy. This might lay the research open to the accusation that it is making presumptions about the government's position on water stress. However, position statements may satisfy journalist enquiries, but a real test of efficient policy is the extent to which the agencies or authorities operationalising policy are doing so at a grass roots level. The overwhelming conclusion from the results is that water stress is almost invisible from political and policy agendas. Within all the fieldwork there were only two respondents who alluded to assured future domestic water supply as a concern (see Chapter 5) this was solely in the context of domestic water provision. Agricultural and industrial water supply, water quality and sewerage treatments were all ignored as areas of concern.

At this stage, it is necessary to reconsider the concept of legitimacy that underpins this project. One concern is that few authors have attempted to locate legitimacy within a natural resource management context. The research done to date that specifically addresses legitimacy and water focuses either

on water rights (Turton, 1999b; Bakker, 2000) or the structure of the water management regime (Maloney, 1999; Kinnersley, 1994). It may be that the concept of legitimacy requires further development before it can be properly applied to water. However, whatever revisions are needed to the deployment of the concept in the context of water, it is hoped that this work has dealt with the most basic and compelling concerns. The concept of legitimacy dialogues is aimed at making possible a deeper understanding of the complexity of relationships at the catchment scale, but could also provide a model for understanding the broader operation of legitimacy.

The choices made in selecting the empirical research methods have been clearly detailed in Chapters 5 through to 7. Reflecting on the research methodology an alternative, or even complementary, approach may have been possible. This could have made use of a focus group. Work with a focus group could have been performed either in place of the Fenland scoping study or as a supplement to this method. The major reason preventing the use of focus groups were the time and cost constraints of the work. However, focus group data may have allowed for a more localised slant on the questions in the household survey. It may also have enabled a clearer crossover with the types of questions covered in the interviews in Chapter 7.

Criticisms could also be addressed at the study of governance bodies in this work. As outlined in Chapter 4, the governance bodies operating on the River Nene have been structured by the privatisation process undertaken in 1989.

To date the scholarship has been undertaken which explores the impacts of this regime change. It might well have been useful for this thesis to address respondent's views of privatisation. However, given the thesis' objectives it would have been hazardous to attempt too much novel research within one research activity. It is necessary to be selective and avoid a confusion of the aims and objectives of your original proposal.

8.3 Reliability of data

As outlined in Chapters 4 to 7, the empirical data used in this thesis has been collected following strict criteria to ensure its reliability. The methodologies used in Chapters 5 and 7 follow rigorous and clear disciplinary protocols. For the data collection methods in both these chapters, back-checking to ensure consistency, accuracy and reliability were undertaken. The approach of the Fenland scoping review, detailed in Chapter 5, was less structured. It utilised question areas rather than specific questions. Rigour and consistency within and amongst interviews was still applied. As the aim was, in part, to instigate an informal 'chat' with respondents, the reporting method varied slightly as some interview notes were written immediately after interviews and some logged during the interview.

Non empirical material has been drawn from well respected academic papers and books which have been subject to peer review. The inferences drawn from this data has been clearly sited with references and where necessary

explicated in footnotes. The thesis has tried as far as possible to use clear language and, in its structure, to provide clear links between chapters, and within chapters, between sections.

Although the theoretical model work detailed in Chapter 6 was concerned with analysing data rather than generating it per se, its reliability should also be discussed. As an exploratory tool the legitimacy dialogues concept should be viewed as provisional and experimental. As a paper detailing the design of the model is currently forthcoming it has not yet reached a published peer review stage. A poster concerning the model was presented and discussed at the 2004 Stockholm World Water Week. Feedback from this event was encouraging. Generally participants felt it was a promising way of examining legitimacy within water user and water governance relationships.

Developing the model further would require work that is not possible to undertake within the scope of this thesis. It would be necessary to show a practical application of the model in reducing tensions and frictions during the implementation of policy. This need for a practical application of the model suggests possible directions for future research. In summary, the author is aware of the need to test the robustness of the model, but it is hoped that it is sufficiently developed to act as a heuristic device in this thesis.

8.4 A reconsideration of water stress

Chapter 2 has placed this work in the context of scholarship to date. It has explained why the problem area addressed by this thesis has not been fully satisfied in the relevant scholarship to date. This section will now outline how the thesis complements or supersedes relevant work within its subject area.

Water stress as a concept is firmly established. Current water stressed countries are readily identifiable and can be listed according to their relative water deficit. However, still open to debate, and discussed at length in Chapter 2, is a definition of water stress that is universally accepted. The thesis uses a justified, though still somewhat contentious, definition of water stress. This takes declining water quality as a main indicator; but it includes into the definition a regard to those incidents that hamper or prevent potable water provision and water treatment processes and policies which contribute to water stress hot spots. This allows water stress to be seen as more than simply reduced to natural aridity or the effects of climate change. Water stress is placed in a political context.

This broader definition would also allow an understanding that water stress can be ameliorated to some extent by policy; but with attendant high transaction costs.⁸² The existing literature reveals a tendency to focus on macro level or structural causations and so recommends policy solutions at

⁸² These transaction costs may include large development grants to regenerate low population areas, or tax discounts to encourage business development in these new areas.

this scale. However, there is also a growing literature on catchment scale solutions, but no work published to date has focused on English and Welsh examples. Thus, one contribution that this thesis makes is to put forward an argument that water stress may not always be the result of natural events but may develop as a result of embedded policy decisions that tend to ignore the long term impact they have on water resource management even in historically water rich areas.

Having established a definition of water stress indicators, the thesis went on to assess whether water stress appeared on policy agendas or was a matter of public concern. The results from the desk study, and the empirical fieldwork, reveal that water stress is not a major concern with either water users or governance bodies. The Fenland scoping review highlights that there are a diversity of concerns connected with water that are linked to a respondent's domain of activity, rather than to a general affiliation with stewardship over the river. The domestic householder survey demonstrates that generally people feel that the water environment has not changed or declined and that there are no pressing water management concerns. Householders are satisfied with the price and quality of their tap water. These findings confirm MORI's 2002 survey. When asked to recommend types of policy change the majority of householders signalled restricting polluters and building on floodplains. None of the 390 respondents cited water stress as a specific concern they would like to see addressed.

Similarly, the interviews with governance bodies and water user groups revealed issues of abstraction, access and navigation rights were important; but in these open response interviews water stress was never vocalised or identified. Even for the water company operating in the catchment, the main concern was water supply; but this was no doubt due to their regulatory remit. The research seems to indicate then that water stress as a concept, unlike climate change, is largely invisible and only selected drivers of water stress, such as rapid building development or pollution of water bodies, are identified by both authority (governance bodies) and citizen (water users) stakeholder groups. This implies that water stress will remain off public and policy agendas until it finds a champion or enters public consciousness.

8.5 Water and legitimacy

This thesis has already isolated the two different ways in which the existing literature draws water and legitimacy together. Water has been linked with issues of access and rights. Literature making this link with the legitimacy of legal or state decisions has focused on the issue of access to water.

Legitimacy has also been considered by literature that deals with the effects of the privatisation of water management regimes. This literature has been reviewed in Chapter 2 in the section dealing with the 'commodification of water'.

Literature on access to water is cross disciplinary, as it deals with legal, social and political aspects of water management. The work of Turton (1999a, 1999b) and Trottier (1999) was seen to be important as they both addressed questions of rights to water and strategies of access. For Turton and Trottier, water and legitimacy exist in a relationship where one section of society is systematically privileged over another. This creates an asymmetric access to resources. This thesis has argued that the issue within England and Wales is not so much with a privileging of sectors of society, but that there is a lack of political will to address water stress at all. The work of Turton and Trottier, although important in addressing the role of the state and policy in the developing world, is thus not entirely relevant to the situation in England and Wales.

The research has demonstrated then that the governance bodies operating at a catchment level along the River Nene do not seem to acknowledge water stress indicators. Incidence of unusual catchment response which could be identified as indicators of water stress, such as flooding events, low river flow or declining water quality, are not identified by either the governance bodies or water user groups sampled in this thesis as water stress concerns. This means that currently water stress does not seem to have any effect on the relationships between water users and governance bodies. Instead governance bodies concentrate on national policy decisions and act within the parameters of their operational role; water user associations similarly have

narrow remits of activity – this severely limits innovation regarding water stress from being generated at the catchment scale.

The thesis' contribution to a body of literature concerned specifically with water and legitimacy is to say then that state responsibility is complicated by the reliance of field agents on national agencies for data, finance, staffing and strategy direction. In other words local actors rely on regional organisations for 'official' information. Even if policy formulators are concerned about water stress at a national level this is not communicated downwards. At ground level the sheer weight and speed of new policy administration, such as the impact of the WFD or the Milton Keynes Quadrangle development, seems to preclude either the opportunity or will for feedback from those who work at the catchment scale.

The thesis did also touch upon issues of rights of access to water. Water user groups communicated their concern with rights to water – but only regarding their own interests and not within the context of a holistic view of the river. The farmer's groups concentrated on abstraction rights; waterways groups focused on navigation rights and drainage boards on their right to manage their drainage needs away from outside interference. Rights per se were not treated as a concern within a collective identity and the data does not indicate that these groups collaborate outside of state organised stakeholder meetings.

8.6 The commodification of water

As discussed throughout the thesis, a major body of water scholarship deals with privatisation. This literature has detailed the political process (Kinnersley, 1994; Maloney, 1999); the effects on citizen – state relations (Bakker, 2000) and changes to domestic water use (Herbert and Kempson, 1995; Guy and Marvin, 2001).

What is absent from this work is an appreciation of how privatisation is viewed by citizens and governance bodies some fifteen years after the implementation of the relevant reforms. Surveys detail levels of customer satisfaction with the output of services provided, such as water quality (MORI, 2002), but do not address issues such as management quality or receptivity to future policy change. More specifically, there seems to be no literature published which deals with these issues from an English or Welsh catchment perspective. The thesis has demonstrated then that most citizens have not perceived privatisation as a removal of intrinsic rights to a 'nationally' owned asset. In short there is an acceptance of the changes. There remains a high degree of trust in water companies and a high level of satisfaction with the care of the water environment.⁸³

The high level of receptivity shown by domestic consumers to unfamiliar or stringent policy suggestions also appears to demonstrate that consumers have faith in the need for policy change. This would accord with the

⁸³ However, this does not mean that the new regime is necessarily perceived as an improvement from the model of state run organisations.

acceptance shown to privatisation. It should be reiterated though that none of the empirical fieldwork specifically asked about privatisation. These inferences are, however, grounded in the data.

The thesis thus provides a clear picture that at a general level, along the length of this specific river catchment, water users are generally content with the current water management regime and do not perceive water stress as an imminent problem. The current water management regime and its policy formulation and implementation are seen to be legitimate. The data has shown however, that geographical location does impact on perceptions of management capability. Whilst satisfaction with water quality and the water environment may be universal along the river corridor, institutional capacity shows great variance, specifically at the top and bottom of the catchment. Why this should be is not clear from the data, and is an aspect that could be tackled by future research. Within the confines of this thesis it is enough to say that great care must be given when trying to generalise at the catchment level; that even this unit of analysis is too large and complex. This, naturally, has serious implications for policy innovations which aim to ameliorate water stress; receptivity differs along the catchment, and the results of the legitimacy dialogues lend credence to the argument that relationships between different water users and governance bodies should be the focus of analysis rather than geographical integrity.

8.7 Integrated Water Resource Management (IWRM)

IWRM literature is largely predicated on the need to approach freshwater issues holistically. Following on from this, basin management is highlighted as logical and pragmatic. Traditional multiple governance body involvement is often depicted as promoting contradictory policies that can be resolved by implementing IWRM techniques.

The literature review in Chapter 2 isolated that what is lacking are realistic targets for IWRM operation (Jeffrey and Gearey, 2004). Water infrastructures, especially in developed countries, are generally made up of large capital works that take a long time to plan, build and finance. They are generally planned in conjuncture with other infrastructures and urban developments. Likewise the operational infrastructure that surrounds water provision, water rights, water law, regulations, policies and technical staff, are also embedded. The IWRM schema to simplify national water provision does not schedule how a state can easily and affordably remodel to match IWRM ideals.

This lacuna is highlighted in the thesis' outcomes. Although the English and Welsh model of IWRM is structurally advanced, as catchment management planning has been followed since 1974, there are weaknesses. Though governance bodies may implement policy on a catchment scale the thesis research has shown that the effectiveness of these bodies is irregular, leading to governance 'patchiness'. As the domestic water user survey data indicates, satisfaction with governance at one location may be matched with

dissatisfaction at another. The survey also indicates that IWRM does not necessarily build public confidence in water governance bodies. Chapter 4 shows that the overwhelming public perception is that post 1989, with IWRM principles becoming ever more entrenched; effectiveness, expertise and planning capacity have all marginally declined. This thesis thus makes a contribution to the IWRM literature by providing catchment scale data to support the need for more practical recommendations for improving IWRM implementation.

8.8 Adaptive capacity

This thesis has also been concerned with the question of how far societies are able to adapt to water stress. Adaptive capacity and natural resource management have a wealth of literature (Holling et al, 1998; Folke, 2002).

There is also a sub-genre focusing specifically on adaptive capacity and water stress (Turton, 1999a, 1999b; Homer-Dixon, 1994, 1991; Falkenmark, 2000).

On the whole, the literature has clear links with complex systems theory.

However, this remains outside the remit of this research. The literature review focused instead on adaptive capacity and water stress.

Chapter 2 showed how this literature looked at 'first order' water scarcity which is naturally occurring. It goes on to outline 'second order' scarcity, or, a society's inability to cope with first order causes. The focus in this thesis was primarily second order scarcity, considered from a developed country's

perspective. The thesis explored the premise that water stress exhibited by developed countries generally stems from a lack of political will to address, in the long term, the types of structural, cultural and economic changes needed to adapt to shortage. In other words, the cost of rolling out water stress as an imminent concern are too great for any individual government, particularly when the issue is still perceived as emergent and therefore not fully understood. What is missing in the existing literature is a discussion of the implications of second order scarcity in developed countries, before water stress moves from an episodic to an endemic phenomena. To what extent is policy that makes for radical change acceptable in England and Wales?

Domestic water users do seem open and receptive to accepting unfamiliar policy which will alter how they consume water, and this receptivity seems to be bound up with faith in policy making. Water user groups that have ready access to governance actors also seem to demonstrate greater acceptance of decision making. An inference made from these results is that policy makers should have greater faith in the capacity of water users to understand the need for change, if that is indeed one reason why water stress remains off policy and political agendas. One argument could be that it is bound up with climate change issues and so that there may be a reluctance to separate drivers and indicators for fear of diluting or confusing issues. Another may be that state led directives that water companies must demonstrate that they are supporting water efficient initiatives from their customers is seen to be a

satisfactory first step. Both these factors remain outside of the thesis' research remit.

8.9 Legitimacy and governance

Although legitimacy has been discussed above, there has not been a review of this thesis' contribution to examining the operational aspect of legitimacy, as detailed in Chapter 6. The role of legitimacy in modern governance is central. Legitimacy has been described as having 'input' and 'output' elements. The relative strength or weakness of both will have an impact on the overall operational efficiency of legitimacy.

The existing literature seemed rather weak in detailing how researchers can recognise these 'input' and 'output' elements in the field. The literature generally utilised back-casting techniques; identifying strong or weak societies and then explaining how institutions and processes could have contributed to the formation of relative values of legitimacy. This leaves the literature mostly dependent on a traditional political science analysis of institutional and policy document scrutiny. It ignores the possibility that legitimacy could be invested in other forms. As this research's concern was to identify current legitimacy relationships, the literature provided no clear examples as to how this might be undertaken.

As a result of a process of reflexive and iterative operations between both fieldwork and theory, this thesis developed the concept of legitimacy dialogues, outlined in Chapter 6, to try to understand and explain how both water user and governance stakeholders construct the opinions they hold and what they value in either supporting or rejecting decisions and organisations. These legitimacy dialogues may enable researchers to assess to what extent 'input' or 'output' legitimacy plays a role in stakeholder relationships, and if so, what this may mean for shaping policies to accord with prominent legitimacy dialogues. In theory this model could be applied to other fields, not just issues pivoted around water stress or IWRM.

The following section will consider whether the thesis has satisfied its objectives and determine if the research questions have been adequately addressed.

8.10 Reviewing the appropriateness of the research questions and the overall satisfaction of the thesis' objectives

The first stage of this section will be to briefly document how far the research was able to satisfy the thesis research questions (see Table 15). This is followed by a review which considers whether the thesis objectives have been satisfied by the research. Finally a critique will be made of the appropriateness of the research questions in satisfying the research objectives.

The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

Thesis Objectives	Research Questions
<i>To identify the presence or absence of legitimacy in current relationships between water users and water governance bodies at a river catchment scale.</i>	Is legitimacy present or absent in current relationships between water users and governance bodies along the River Nene corridor?
<i>If it is possible to identify legitimacy as operational, to then examine how and where it operates at the river catchment level. In particular the research is interested in exploring the interaction between formal and informal processes of legitimacy at the basin scale.</i>	What are the different needs and expectations of water users and governance bodies in relation to their existing use of the River Nene catchment?
<i>To explore the dynamic that exists within and between water users and water governance bodies in order to assess how water stress may alter these relationships.</i>	Can strengthening legitimacy enable a broadening in response envelopes to allow for more adaptive policy tools to cope with water stress?
<i>To assess the potential adaptivity of these two stakeholder groups to emergent change; what is their potential receptivity to new policy options and management strategies to accommodate water stress.</i>	What policy options to combat water stress are water users and governance bodies willing to consider?
<i>To document what policy and planning options water users and governance bodies themselves forward as possible strategies to combat water stress at the catchment scale</i>	Are the institutions, organisations, agencies and bodies responsible for the governance of water resources and water services in the River Nene catchment potentially adaptive to water stress?

Table 15: Thesis objectives and research questions

8.11 A review of the thesis research questions

1) Is legitimacy present or absent in current relationships between water users and governance bodies along the River Nene corridor?

Legitimacy is an essential component of an organisation's ability to function. However, as the thesis has shown in earlier chapters, its identification is not a straightforward process. This makes this question extremely hard to answer with any degree of certainty; so the answer can only reliably be speculative.

The evidence from the research indicates that although there is no Habermasian 'legitimacy crisis', there is patchiness along the catchment in terms of perceptions of governance effectiveness. The results from this household questionnaire data indicates that where governance bodies are viewed as effective, efficient and good planners, domestic water users are more likely to readily accept novel policy options which seek to reduce water demand. However, some policy options, in particular radical price hikes and water recycling, appear to be unpopular despite the overall good public image of the governance bodies.

2) What are the different needs and expectations of water users and governance bodies in relation to their existing use of the River Nene catchment?

At the outset of the thesis it appeared that there were two distinct stakeholder groups: water users and governance bodies. These were also categorised later in the thesis as citizen groups and authority groups. It became clear throughout the course of the fieldwork that there are overlaps between these

two stakeholder groups. The clearest examples of this are the Internal Drainage Boards (IDB). These are co-operatives established to manage drainage in rural, mainly agricultural, areas of the River Nene catchment. IDBs also exist in other catchments in England. Almost always IDBs are completely composed of farmers. IDBs have revenue generating facilities and are consulted by local planners and councils on building developments on which they, the IDBs, charge a levy. IDBs also have featured prominently in the River Nene CAMS process.

This blurring between the stakeholder groups means that generalisations cannot be made for the two stakeholder groups. Instead the thesis has attempted to look at the needs of the particular organisation or category type. For instance, when looking at specific water user associations such as the IDBs, the Inland Waterway Association (IWA) or associations which include water issues in their modus operandi, such as the Wildlife Trust or the RSPB, the thesis has focused on the particular concerns of each group and determined how these concerns shape the negotiations and discussions undertaken with governance bodies.

These water user groups are increasingly seen as able to make a contribution to governance. In other words, they do not exist simply for awareness raising or campaigning. Examples from the research include IDBs determining water and summer water levels in ditch levels to protect fauna and flora; the RSPB liaising closely with the EA regarding sluice gate operation times and the

Wildlife Trust being involved in the development of green engineering (SUDs) for flood mitigation.

However, there does seem to be little interaction between individual domestic water users and governance bodies. The household survey showed both consistent levels of satisfaction with most areas of water governance (i.e. environmental protection, service levels, pricing, quality etc) and a very strong desire not to participate in water resource management decision making processes. Domestic water user associations such as WaterVoice were absent from the research – no domestic user named them. They were also absent from the Nene CAMS process (where householders were represented by the water company) and were not mentioned in any of the interviews by any user groups or governance bodies.

This absence is also true for industrial users within the catchment. There appeared to be no visible user association representing industrial users. Large industries, such as the Carlsberg brewery in Northampton, Lafarge Aggregates and Premier Foods in Wisbech were invited to participate in the research but all declined. As a result the thesis cannot speculate on their needs and expectations.

The variety and diversity of needs and expectations for water user groups is also true for the governance bodies. The regulators operating at the catchment level (the EA, AWS and to some extent DEFRA) each have their

own tightly defined sphere of activity. As has been discussed in previous chapters, AWS is only concerned with water supply and treatment. Issues of water pollution or infrastructure planning are only a concern if it impedes their sphere of activity. Conversely, the EA are concerned with providing a good quality water environment and with operationalising the policies determined by DEFRA. Local planners meanwhile aim to satisfy their own remit. The research showed that there is no holistic, co-ordinated plan or vision for the catchment to which all these separate governance bodies could adhere.

This research question has provided an opportunity to uncover the diversity that exists within and between these stakeholder groups; and has highlighted the care needed when trying to categorise a group as either a user association or a governance body, as there is often congruence between the two.

Some care does also need to be taken when using the terms 'needs' and 'expectations'. Both of these terms are not quite appropriate as 'need' is highly subjective and 'expectation' cannot fully convey the interchange that goes on both within organisations and associations and between them. On reflection, the question may have benefited from more subtle phrasing to reflect the compromises that take place when trying to champion a particular policy or goal. In terms of the satisfaction of the ethos of this question, the research was able to determine what water users and governance bodies would like to

see happen with regards to the resource, and this was fully documented in each of the appropriate chapters.

3) Can strengthening legitimacy enable a broadening in response envelopes to allow for more adaptive policy tools to cope with water stress?

This is a highly subjective question that is not easily validated. However, it is an interesting one, which makes it a useful research question. The thesis examined legitimacy in a number of ways. However, although legitimacy can be recognised as an essential component of good governance actually identifying it is not an easy task.

The thesis would not attempt to argue that the results of this one piece of research are enough to draw firm conclusions. However, it does open up possibilities for directions for future research. Amongst these possible directions may be more work on the legitimacy dialogues. This may provide insights into what shapes respondent's response envelopes i.e. aside from perceptions of governance credibility, how else can we persuade or convince water users to have faith in novel policy options that promote adaptivity?

4) What policy options to combat water stress are water users and governance bodies willing to consider?

As has been shown within this research, water stress is not a concern or issue that has a high profile within this catchment. This means that the thesis has to be careful to phrase questions in such a way so that respondents can identify with the content. Furthermore, those questions must also satisfy the research aims and objectives. The thesis approached water stress issues differently for each fieldwork activity.

In the Fens scoping interviews respondents were informally interviewed, with six core topics shaping the discussions. The results, whilst being extremely informative, did not specifically cover policy options.

The second piece of fieldwork, the household questionnaire, phrased questions either in terms of combating flooding or reducing water demand. The flooding questions asked respondents to suggest policies they would like to see deployed. These ranged from preventing building on floodplains, heavier fines for polluters right through to a wide range of obscure answers. No geographical variation in answer type was identifiable. The answers were on the whole very conservative and dealt with policies that were immediate to the catchment. There were no suggestions for structural, economic or cultural change to combat flooding.

Questions concerning possible policy options to reduce water demand were more ambitious. As detailed at length in Chapter 5, respondents were content to accept enforced water metering; reduced toilet cistern capacity, surcharges

for private swimming pool owners and garden watering curfews. The majority of respondents were not willing to accept enforced grey water reuse or the trebling of water bills.

In the final fieldwork activity the two water stress scenarios, flooding and rapid urban development, provided water user associations and governance bodies with the opportunity to reflect on different solutions. As detailed at length in Chapter 7, the responses tended to reflect the individual organisation's concerns rather than any holistic catchment vision. This suggests that at the catchment level there is no drive to forward plan for water stress. Those who respond do so at a piecemeal, small scale and appear unable to think in structural terms.

5) Are the institutions, organisations, agencies and bodies responsible for the governance of water resources and water services in the River Nene catchment potentially adaptive to water stress?

The thesis has already outlined at some length what is meant by adaptivity. Put succinctly, adaptivity tackles the question of the extent to which actors and institutions are capable of coping with emergent change, in other words, change which is novel.

This is a difficult research question to answer, mainly because there is no objective way that adaptivity can be tested. In particular, as water stress is an

'invisible' concern, the answer to this part of the question can only be speculative. Given these difficulties, the focus has been placed on a consideration of how actors and institutions have handled change in the past, learnt from change and are prepared for change in the future.

We have seen from research question one that the thesis uses a broad definition of governance that includes both water user groups and more formal governance bodies such as the regulators, planners and local councils.

Looking at the results of the desk study it is possible to say that the transformation of the water sector in 1989 was a significant test of adaptivity for the relevant actors and institutions. Even though some of the key bodies remained essentially the same, for instance the water companies retained a river basin scale of jurisdiction, new regulators and strict regulatory practises were implemented. The fieldwork research in the Fens and in households along the catchment has demonstrated that the water sector was able to successfully cope with these radical changes and still provide trusted services to users and retain working relationships with other governance bodies.

The structured interviews that utilised the flooding and rapid urban development scenarios also provide insights into perceived adaptivity of water management institutions. Referring to the floods of Easter 1998, the majority of respondents felt that though the relevant organisations had been ill prepared for an unexpected and unprecedented event, these organisations had evaluated their performance and taken steps to ensure they could cope

with a future event. This demonstrates that at a catchment scale organisations are involved in adaptive management and attempting to learn and progress from past mistakes. When asked what may limit an organisation's ability to cope with unexpected events, funding and manpower seem to dominate the agenda.

Yet adaptivity is not just about learning from past mistakes and improving. It is also concerned with an ability to cope with the unexpected. The fieldwork indicates a number of factors that may severely hinder this ability. Firstly, the regulatory system is very tightly defined by statute. This leads to a rigid sphere of operation that could lead to insularity and a focus on the organisation, rather than the organisation's role. For example, the water companies are controlled by both the 'k-factor' that determines their pricing levels and by the five-yearly Asset Management Plan (AMP) submission cycles. Secondly, some of the organisations at catchment level, such as the EA and the planning authorities, are not policy makers but operationalise policy. This rigid structure hinders innovation; a crucial issue when considering adaptivity. The literature detailed in Chapter 2 described a core element of coping with change as the freedom to imagine possible futures. This type of 'blue sky thinking' occurs at the national level, for example within the Civil Contingencies Unit and through government research centres such as HR Wallingford, but does not appear present at the River Nene catchment scale. Adaptivity therefore is not encouraged at a river basin scale.

The research has also revealed factors that serve to block adaptivity at the catchment level: funding, staffing capacity and levels, channels of communication and an absence of catchment vision. Limited funding is an issue that affects both water users and governance bodies and has a further impact on the other three factors mentioned above. Without the adequate financial resources to enable the key hallmarks of adaptivity (risk-taking, innovation and experimentation), actors and organisations are unable or unwilling to trial new approaches to forward planning.

Turning to staff capacity and staffing levels, many respondents indicated that reduced staffing and new management approaches took expertise away from the catchment. Staff turnover was also cited as a problem as part of a general move away from dedicated staff who understood the river's natural cycle. This lack of particular knowledge tends to reduce the ability to look at the 'bigger picture' of the river and anticipate change. An NFU representative noted that the current move in Common Agricultural Policy reforms away from food production and towards Environmental Stewardship initiatives was paying farmers to undertake roles that they had traditionally carried out; noticing changes in their local environment.

The third factor, channels of communication, seems to have a great deal of influence on adaptive capacity. In the Fens region there appears to be a close knit community that seems to enable quick decision making and immediate accountability. Higher up in the catchment these lines of communication

appear to be more formal and so less immediate. This could indicate one reason why public perceptions of water resource management capability vary along the catchment. In terms of adaptivity, more formalised relationships are likely to be compromise risk taking, innovation and experimentation.

Lastly, it is the lack of catchment vision which leads the thesis to conclude that the institutions, organisations, agencies and bodies responsible for the governance of water resources and water services in the River Nene catchment are not yet fully adaptive. Although water management operates at the basin scale, there seems to be no integrated plan that envisages the future of the catchment. This is demonstrated by the confusion generated by the 'Milton Keynes Quadrangle' discussed at length in Chapter 7. Although the plans currently only impact on part of the upper catchment of the river this will certainly have an influence on the river's function throughout the corridor. However, as yet, no organisation has been given the responsibility to map what types of change may result from this development. There is also no coordinated plan to cope with emergent change at the catchment scale. This type of planning may be operating at a national scale, but in terms of the catchment's ability to respond and adapt, there is little evidence to show that this is currently feasible for unprecedented change. For events that have been experienced before, such as flooding, water shortage caused by droughts or public health outbreaks, there are controls set in place – though these may be seen as reactive rather than as adaptive responses.

As stated in Chapter 1, the research has then five key objectives:

1) To identify the presence or absence of legitimacy in current relationships between water users and water governance bodies at a river catchment scale.

It can be justifiably argued that legitimacy is present between water users and governance bodies at the river catchment scale. There is no indication of dissatisfaction between either group, though there is not homogeneity of levels of trust or satisfaction along the catchment.

2) If it is possible to identify legitimacy as operational, to then examine how and where it operates at the river catchment level. In particular the research is interested in exploring the interaction between formal and informal processes of legitimacy at the basin scale.

Although it is possible to identify legitimacy as operational, it is almost a redundant question to ask how and where it operates. This is because an absence of legitimacy would, presumably lead to operational breakdown. This may be reflected in personnel change, media exposure, public campaigns and public enquiries. However, this is speculation. The thesis can only suggest that where there is no apparent crisis, and the fieldwork provided ample opportunity to uncover an absence of legitimacy, relationships remain stable.

When looking at formal and informal processes of legitimacy there seems to be a great deal of interaction. As stakeholder involvement in decision making becomes both a more popular way of organisations claiming transparency and as Article 14 of the WFD demands more public participation, the opportunities for user groups and governance bodies to integrate increases. However the research would suggest that this does not always result in true integration or communication between both stakeholder groups and that an element of tokenism remains present.

3) To explore the dynamic that exists within and between water users and water governance bodies in order to assess how water stress may alter these relationships.

The satisfaction of this objective is limited by the recognition that water stress is not a concept which is freely used either by the water users or governance bodies consulted within this thesis. Therefore there is no direct means to answer this question. However, it is possible to say that the research has shown that water users are willing to view novel policy options which reduce water demand as legitimate. It would be reasonable to argue that this indicates that water users appreciate the need to co-operate with governance bodies concerning issues of water resource management.

How far water stress may alter these relationships is difficult to answer. It would be prudent to state that this objective has not been satisfied, as to

answer this question with a high degree of certainty would be to fall into the category of pure conjecture.

4) To assess the potential adaptivity of these two stakeholder groups to emergent change; what is their potential receptivity to new policy options and management strategies to accommodate water stress.

The research questions have been successful in addressing this thesis objective. As has been demonstrated with the fieldwork results, water users and water governance bodies have been able to adapt to radical change – as demonstrated with the smooth transition to a fully privatised sector and with initiatives within the catchment to lessen the risk of flooding. This has demonstrated their capability to learn by doing; an essential element of adaptive management. Yet the research has also shown that there are practical barriers to adaptive capacity at the catchment level and that these may limit the possible scope of both stakeholder groups' abilities to envision change.

The research was also able to comment on policy options to accommodate water stress; though it must be reiterated that water stress is approached in the fieldwork through the use of scenarios as it is not yet a popular term in the same way that, say, climate change is.

5) To document what policy and planning options water users and governance bodies themselves forward as possible strategies to combat water stress at the catchment scale.

This objective has also been satisfied by the research questions which have shaped the fieldwork.

Looking firstly at water users, the thesis has shown that water stress does not seem to be a concern. This conclusion is drawn from all three fieldwork activities where the term was not volunteered as a concept that would be applicable to the River Nene. Also, as the household questionnaire revealed, there are no pressing concerns with the environmental status of the river or with domestic water quality, price or service. Water users were able to volunteer policies that would help reduce flooding and also revealed the types of water policy they were willing to accept to reduce water demand. Water user associations were also happy to provide options for reducing the impact of flooding and rapid urban development schemes. Yet as detailed above, the options were quite conservative in scope and circumvented issues of structural change. This could indicate that the potential impact of water stress cannot be visualised by water users. If we compare policy strategies in water stressed developed countries such Israel or Malta we see a wide range of options in place including water and effluent reuse systems in agriculture, rainwater harvesting and desalinisation. These policies are highly visible and require requisite cultural and economic adaptivity. The thesis deliberately did

not include these policy options within the research as one of the aims of the thesis is to gauge the baseline of water stress before it becomes a common term of use within the catchment. This helps us to appreciate the difficulties that policy makers may face when trying to pitch the level and speed of policy introduction.

Surprisingly, governance bodies are not radically different from water users. Again water stress as a term is largely invisible; though the water company did mention it as a concern for the future during the structured interviews fieldwork. The current focus for both the EA and DEFRA is on flooding, even though the region experienced drought events for many years up until 1992. This indicates that natural cycles have a large impact on policy, possibly because governance bodies need to be seen to be 'doing something' as natural events take place.

Although governance bodies are, obviously, more aware than water users of the need to appreciate the full range of policy options which are open to them, the research again indicates conservatism in approach. This may be the result of pragmatism on the part of the governance bodies in what can be reasonably achieved. Yet the research was conducted in such a way as to provide opportunities to think widely about policy options. It would appear then that the catchment governance bodies have few concerns regarding water stress.

The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

The following and ultimate chapter of the thesis provides the main conclusions of the thesis and outlines approaches for future work.

Chapter Nine: Conclusion

9.1 Satisfaction of the thesis aim

The thesis has focused on the role that legitimacy plays in the relationships between water users and governance bodies. It has been argued that understanding the operation of legitimacy in these relationships can assist in evaluating, developing and deploying policy options that aim to resolve the incipient problem of increasing water stress. This aim has been addressed through undertaking empirical research with water users and governance bodies along the River Nene catchment. This empirical data was reflexively reviewed within the conceptual framework that underpins the thesis, to evaluate how far legitimacy may play a part in enabling successful processes of change and adaptation.

The thesis has eight key conclusions that address the aim and objectives of the thesis.

9.2 The implicit presence of legitimacy

One of the objectives of the thesis was to examine the role that legitimacy plays in the (working) relationships between water governance bodies (also deemed authority types) and water users. The definition of legitimacy was developed from the governance literature and views legitimacy as functional; it enables people, processes or policies to operate. A methodology was then

considered that would recognise legitimacy relationships between governance bodies and other stakeholder groups.

Empirical fieldwork was viewed as the best method of collecting data that would relate to the legitimacy thesis. The results of that data fed into the development of the legitimacy dialogues model.

The results of the empirical work suggest that although formal modes of legitimacy are recognisable and can be assessed (for example, the compliance of statutory regulators with their remit to provide a safe, reliable water supply), the informal modes of legitimacy (for example the extent to which water users trust water supply provision) are more difficult to identify, but equally as important.

The analysis of the data suggests that domestic water users have trust in the service that governance bodies provide and feel that the water environment is not degrading. Satisfaction with service standards varies along the catchment; most notably respondents at the top of the catchment display greater levels of dissatisfaction compared with respondents at the bottom of the catchment.

Water user groups have interest specific concerns relating to governance body performance, but overall they do not voluntarily suggest alternative organisations or policies to replace those currently operating. This implies an underlying degree of satisfaction.

Water governance bodies themselves indicate that the general regulatory framework seems to be satisfactory. There is no dominant view that a particular organisation or policy is in need of replacement. Rather, there is a prevalent pragmatism. Most respondents believe that it is impossible to develop a perfect system free from error or room for improvement. This pragmatic approach reinforces the impression that the current system is deemed legitimate i.e. it has high levels of both input and output legitimacy.

In all the fieldwork exercises, bar the last question in the structured interviews, legitimacy was not specifically addressed. Instead, the fieldwork attempted to uncover whether the term would be voluntarily used. On no occasion was the term 'legitimacy' voluntarily used. This suggests that there is no explicit concern with legitimacy, subsequently no legitimacy gap evident. Neither stakeholder group appear to contest the current water management regime.

This implicit acceptance of the water governance regime provides great scope for policy makers. As we have seen in the literature, a high degree of legitimacy allows policy makers wide decision making parameters i.e. policy subjects will be more willing to accept unfamiliar or harsher policies. This was demonstrated within the household questionnaire when respondents deemed a range of radical policy changes legitimate.

9.3 Water user associations and governance bodies operate within their own sphere; there is no collective 'stakeholder' identity in either group

When analysing stakeholder groups there is a tendency to assume they have collective identities and a shared modus operandi. The NSM literature, already discussed earlier in the thesis, highlights the nature of civil society associations. They have an identity formed around the cause that underpins that group. Associations can be long term and connected with issues of interest, or short term and focused on an issue.

The research shows that user associations have similarities of concern, for instance environmental groups all view nitrate levels in the River Nene as problematic. However, as these user associations represent both groups with specific views, such as the internal drainage boards that focus in drainage on their land, and those such as the waterway users groups with wider concerns over the entire catchment, these agendas operate at different scales.

This creates difficulties in the analysis of the relationships between stakeholder groups, as each operate within their own sphere. This is also true of governance bodies. Planners operate in their own tightly located geographical jurisdiction and regulators operate at the catchment scale. There are, therefore, negotiations of relationships between and within these groups.

There are several implications of this finding. Firstly, any participative initiatives at the catchment scale will be tempered by the diversity of individual

concerns vocalised by organisations represented by both stakeholder groups. This diversity may form an obstacle to hinder the effectiveness of water stress initiatives if these initiatives are based on the assumption of a common concern. The limited outcome of the Nene CAMs process is testament to this. The way forward may be to accept this problem and find a way to build a common identity between the groups. Water stress may even act as a catalyst that helps bring together this common heritage. However, this would only work if water stress is perceived as a legitimate problem. There remains scepticism within the respondent groups about the validity and use of scientific data.

This leads to a second question for policy makers. In order to create a common heritage which privileges water stress, is it first necessary to allow episodic water stress events to become more severe? There is an argument that radical policy and attendant initiatives will only be deemed legitimate if the negative effects of water stress are first experienced. Common exposure to the problem may be the most cost and time effective way of providing commonality between and within these stakeholder groups. This, obviously, has to be weighed against the cost implications of allowing the problem to develop, rather than preventing the problem in the first place.

9.4 There is currently no holistic vision for the River Nene evident amongst water users and governance bodies operational at the catchment level

Catchment based planning for English and Welsh river basins has been operational since the 1974 creation of the regional water boards (Kinnersley, 1994). Privatisation aided this process by developing a tightly regulated system with distinct remits of authority and institutions responsible for water supply and care of the water environment (see Chapter 3). The implementation of the Water Framework Directive (WFD) in 2002 requires all member states to provide good water status and organise water resource management on a catchment basis. As English and Welsh water management institutions have operated at this scale for a number of decades, they therefore should already be able to easily implement the WFD.

Yet the findings generated by this research question how far institutions are managing to achieve a holistic vision for the catchment. Key institutions appear to be limited by their need to interface with other organisations, which do not have water management as their central concern. Examples include planners continuing to develop on floodplains, central government planning huge regional housing development without close consultation with the water companies to ensure availability of water supply and environmental groups excluded from planning processes. Of the four regulatory bodies (the water companies; the Environment Agency; Ofwat and the DWI) only the water

company and the Environment Agency are operational at the catchment level.

This thesis has thus concerned itself only with these two institutions. When interviewed, both the water company and the EA were able to articulate concerns which span the length of the catchment.

The water company articulated their concerns in terms of possible impacts to the river from flooding, drought events and new building development. Their concerns for the River Nene were based on their statutory obligation to supply water. This obligation may be compromised by the interface of other bodies such as the ODPM, local planners, farmers and environmental groups whose own objectives often lead to disagreements on the best use and planning methods of, and for, the river. We can thus see that holistic planning is compromised because there is no common vision for the river from all those parties that can exert an influence over the use of the river. In essence this reflects a lack of 'joined up governance'. To return to the concept of adaptive capacity, it could be suggested that adaptivity is limited by a lack of a vision that will unite all the organisations.

The EA's scale of operation is also along the whole catchment. However, the internal structure of the EA is such that areas of expertise are demarcated.

There is a navigation manager for certain catchments; an environment manager; a flood risk engineer and other posts with specific responsibilities.

This means in practise that although planning occurs at catchment level, 'joined-up planning' is determined by the extent to which these managers can

coordinate with each other. It must be stressed at this point that this research is only concerned with catchment operations, and so a full analysis of the EA and its internal mode of organisation is outside the scope of this thesis. Future work may have to take into account a study of the management structure of the EA.

The EA's planning process may also exclude local knowledge from policy formation at catchment level. Although planning on a riverine scale relies on utilising general information regarding hydrological characteristics, local knowledge can reveal important differences along parts of the river. The opportunity to harness this knowledge by the EA is, at present, limited. Staff turnover problems reduce embedded staff knowledge, and make liaison with people at local level difficult; especially if these relationships require a long term development of trust and cooperation. This failure to include local knowledge may lead to governance patchiness. It may also help to explain the results of the findings which show difference in perceptions of service from respondents at the top of the catchment and those from the bottom. This could also be a weak point as relationships are stretched by increasing water stress.

Other governance bodies operational along the River Nene appear to have only a local view of the river – as demonstrated by responses to the flooding and Milton Keynes Quadrangle development scenarios in the structured interviews fieldwork. This localised view is either geographically specific (such

as the IDBs) or accords with certain job remits (such as Council employees).

Planners in particular seem unable or unwilling to speculate on the impacts of local growth and infrastructure development on the entire river. In particular the effects of rapid development on water supply and water quality were never raised as a concern. Planners tended to defer on this issue to the water companies, and to see it as falling entirely within their remit of responsibility.

As stated in conclusion 2, the water users themselves do not have a holistic view of the catchment. Instead they focus on their specific concerns. In terms of water stress we can say then that neither water user associations nor water governance bodies appear to be fully adaptive at catchment level. Although domestic water users appear to champion some new policy option initiatives, they also feel uncomfortable with technology innovations that could help reduce water stress.

This limited ability to envision the needs of the whole catchment by both stakeholders may seriously compromise any future initiatives to reduce water stress. Enabling stakeholders to think about the river in its totality before water stress conditions prevail may improve both legitimacy relationships and act as a solid platform for future policies to ameliorate water stress.

9.5 Water users are receptive to policy options that reduce water stress

As discussed in Chapter 8, water users are receptive to policy options that reduce water stress. This provides firm evidence that water users are able to

grasp the significant changes that water stress may necessitate. The implications of this are significant for the thesis. Although water stress remains off public, political and policy agendas, it still may be possible to already initiate a process of education regarding water stress. Education campaigns are already currently operational, with the EA championing water efficient technologies and water companies providing information to support water efficiency around the home. Tagging water stress issues onto the back of these current campaigns may be a cheap and efficient way of beginning to talk about water stress and its wider ramifications.

9.6 Governance bodies at the catchment scale have restricted policy horizons

Although governance bodies along the River Nene catchment have quite clearly defined remits in terms of scope of authority, their responsibilities are not necessarily translated into a holistic vision of the river basin (see above; conclusion three). This has a major impact on the ability of these governance bodies to develop or envisage strategies to ameliorate water stress.

In part this seems to stem from the disparity between policy making and policy implementation functions. None of the governance bodies operating along the Nene catchment are policy making agents. Instead they implement policy. This makes them reactive and severely limits opportunities at the basin scale for developing policy which is pertinent to a particular river catchment.

This fact also discourages governance bodies at the catchment scale from addressing the structural changes that may benefit the river. No governance body interviewed during the fieldwork activities were able or willing to outline an ideal scenario for collaboratively and collectively managing the catchment. In many ways this may be simply due to pragmatic considerations of how large organisations are run. As has been outlined earlier, financial, manpower and communication constraints all play a part in deterring co-operative strategy development. The current invisibility of water stress may be the pivotal factor in preventing any need to develop 'blue sky thinking' about how water issues in the catchment are planned for the future.

The limited policy horizons of governance bodies, which appear to be rooted in the particularistic needs of their parent organisation, certainly affect the potential to develop strategies to ameliorate water stress. Although processes such as the Nene CAMs and forums such as the consultation process for the Milton Keynes Quadrangle and the Northampton flood protection scheme, do bring governance bodies and water users together, this is to discuss specific issues, rather than emergent or unknown future events.

Another concern is the extent to which a lack of horizontal integration across sectors and planning regimes can cause conflict or problems within water governance. This theme is prominent in the Nene case study area as the catchment is within the 'Milton Keynes Quadrangle' that the government has

elected as a growth area to support out-migration from London. Although around 800,000 new homes are planned for the region over the next twenty five years the government has conducted only a cursory consultation process with the water companies involved in planning future bulk water resources and water supply strategies. This lack of horizontal integration may be of more relevance in the context of changing conditions of water availability and quality than to the challenges of vertical integration within the sector.

In terms of types of change to support water stress strategies, it appears that leading governance bodies, such as the EA or DEFRA, should try to initiate fora to discuss issues at the catchment scale. A recently produced government report, FORESIGHT, does discuss at length future forecasts for flooding and its impacts on individual river corridors. It may be helpful to think widely about how this same approach could be replicated specifically for water stress factors.

9.7 Water stress is mainly absent from the catchment agenda

This thesis began with the argument that water stress was absent from public, political and policy agendas. Unlike climate change, water stress is not a term with which people are either familiar with or comfortable using. One objective of the thesis was to determine why water stress remains off the agenda.

The empirical fieldwork shows that water stress is not a current concern at catchment level. Generally, water users are satisfied with the status quo. Privatisation seems to have had no long term impact on how domestic users feel water resources are being managed. Water user associations would like improvements in their field of operations but there is no high level concern or call for immediate action or redress being vocalised within the catchment. Governance bodies themselves do not raise water stress as a key issue; only the water company speculate that water supply may become an issue, but even here alternative plans are being built into their planning cycles.

Water stress is not currently a common phrase. It does not, for instance, have the presence that global warming or climate change claim in the press and the media. Not one respondent from either stakeholder group articulated a fear or concern over water stress in the same way that climate change was articulated. This disjunction between a water stress event (such as a flood or drought) or a water stress effect (such as increased pressure on a resource) and its articulation can be viewed as significant.

This disjuncture suggests that when the articulation, definition or dissemination of water stress as a concept enters the public consciousness the strengthening of legitimacy relationships will help reduce the transaction costs of future remedial policies. These legitimacy relationships need not be reliant on using water stress as a fulcrum. Rather, it is more salient to engage in long term relationships over issues that carry positive connotations, for

instance environmental stewardship, or the efficacy of regulator's time and resources.

The question becomes: is legitimacy currently strong because there is no water stress agenda, or will water stress fundamentally undermine legitimacy relationships? The thesis' findings are based on an assumption that the data does appear to show that legitimacy is present and implicit, but it would be short sighted not to speculate on whether water stress may seriously erode legitimacy. The only scientific conclusion is to state that these research findings should be supported by further research within a clearly diagnosed water stressed catchment in England or Wales and also with a repeat of this empirical fieldwork within the River Nene catchment in future years.

9.8 There is variation in perceptions of governance capability along the catchment

This finding is stated above, but it is worth reiterating as a conclusion in its own right. It is important as an outcome because it informs us that policy instruments aimed at water users may not be fully effective at a catchment scale. Instead, their effectiveness may be improved by targeting needs at the sub-catchment scale. Further research would need to be undertaken to determine if these sub-catchment perceptions are also valid for other types of policy and other governance institutions.

This variation in perception is interesting because it is geographically specific. When results from population surveys are analysed, certain key variables such as age, gender and social class are used to determine social trends. The data analysis undertaken in this thesis shows that perceptions of water resource management capability are very geographically specific. Analysis was also undertaken to look at rural and urban population difference. Although it was possible to catalogue differences, it was not possible to interpret a trend or pattern to these responses. In other words, these differences did not help the research isolate a predictable response. Likewise, comparing results from the largest population centres, Northampton and Peterborough, also revealed no trends. Given that Northampton suffered severe flooding in 1998 and Peterborough did not, it was anticipated that respondents from these two cities would show clear differences in question response; but again no patterns could be discerned.

However, as has been discussed already at some length, particularly in Chapters 4 and 5, the upper and lower catchment show marked differences in their responses. Upper catchment residents, orientated around Daventry, show a predisposition to feeling that management capability has declined since privatisation (this was the point at which a separation of functions occurred). Lower catchment residents, orientated around Wisbech, show a much higher level of satisfaction with management capability; even their trust in water quality was an unprecedented 100%. Why this should be is more difficult to answer. Typically one would expect respondents at the bottom of

the catchment to have more issues, as downstream riparians are subject to changing factors all along the river. The Fenland scoping study also indicated this in several ways, with dissatisfaction with declining water quality, increased run off and poor maintenance of infrastructure (see Chapter 5) articulated by water users. These two research activities thus seem to provide contradictory results. Yet the difference lies in the respondent population, as it is the domestic water user sector that provides the geographical disparity results.

9.9 There is evidence for the existence of legitimacy dialogues

This thesis has both developed the concept of legitimacy dialogues and found evidence of their operation through empirical fieldwork. This is not to claim that this model of legitimacy dialogues is comprehensive or exhaustive; there may be more pairs of dialogue or a singular dialogue that can be determined through more research finesse. However, time constraints on the thesis have precluded further work on this concept.

What contribution to our knowledge of legitimacy does the model provide? It has already been stated earlier in this chapter that legitimacy is seen as a key element of good governance. Yet whilst components of good governance such as transparency and accountability have clear methodologies for recognising them, legitimacy still remains a somewhat abstract concept. An aim of the thesis was to thoroughly explore legitimacy and document its role in

the relationships between water users and governance bodies. This was not an easy task as informal modes of legitimacy are diffuse and largely invisible. The concept of the legitimacy dialogue, as outlined in Chapter 6, was a means to try to describe how a researcher might find legitimacy operating between people and institutions. The model was constructed to help determine how people frame their defence of beliefs and construct their arguments. It was hoped that this model, if developed, might help policy makers to target their policy instruments according to the type of dialogue that stakeholders utilise.

Reflecting on the analysis of legitimacy dialogues found in the interviewing process, outlined in Chapter 7, the results showed that legitimacy dialogues are present but that no defining model types emerge. This leads us to downscale the potential uses of the legitimacy dialogues, but assert instead that we can say that they are present, and that they demonstrate that informal modes of legitimacy are operational and so are important in mediating relationships between water users and governance bodies.

Whilst the development of the legitimacy dialogues is neither comprehensive nor exhaustive, they have revealed a new insight into how response to past events may shape receptivity to future policy. This is essential knowledge when dealing with an emergent phenomena such as water stress. The development of the legitimacy dialogues is not limited to natural resource management discourses, but can be applied to any policy arena.

9.10 Future research directions

Through the development of the legitimacy dialogues, this thesis has endeavoured to characterise the operation of informal modes of legitimacy. The research has shown that legitimacy is operational at the catchment level and that refining our understanding of informal modes of legitimacy may help envisage ways to reduce the transaction costs associated with new policy implementation.

It has already been seen that water users are receptive to novel policy options; strengthening the relationships between water users and governance bodies by reducing the perception of governance 'patchiness' may be one way to further increase receptivity. It is clear that more work needs to be undertaken on the legitimacy dialogues model in order to potentially support this perception shift. It would be desirable to test the model in another catchment which displays similar characteristics and also to try the model in a completely different sector. This would test the model in a variety of ways, not least to see how far researcher subjectivity at the analysis stage may have a bearing on the discussions and conclusions drawn from the results.

The research has also provided commentary on the deployment of the Water Framework Directive. The aim of achieving a catchment wide management approach is laudable. However, catchment based research reveals that there is a differential ability to both interpret the potential of the WFD and to deploy

it. At the macro level with the EA and DEFRA there are still institutional obstacles. At the micro catchment level the WFD is perceived as lying within water regulators' jurisdiction. Factors such as urban planning and land use regimes have a peripheral role and do not yet appear to be fully integrated within WFD implementation. This is highlighted by the cross institutional responsibilities for water resource planning highlighted by the differentiated areas of jurisdiction of DEFRA and the ODPM. Future research could be directed at exploring this aspect of WFD integration with catchment scale operations.

The thesis has been constructed so as to allow the research undertaken to be easily replicated in another catchment. This would provide a control and contrast to the conclusions drawn by this work. It would be interesting to undertake the research both in a catchment with similar characteristics, to help validate the research findings, and also to use a catchment that displays water stress indicators. This research would provide some interesting data concerning the speed and scale of receptivity change to policies which aim to ameliorate water stress. Although this thesis has shown that there is water user receptivity to novel policy options, how far this reflects actual response to those policies being implemented is impossible to state and unhelpful to speculate. Receptivity to water stress and the development of a public awareness of water stress would be a rewarding route for future research projects. Research in a water stressed catchment may provide some interesting comparative data.

The thesis has only dealt briefly with the type of policies which may help alleviate water stress. This is due to the tight research frame of the project. It would be of great interest to explore what types of policy could pragmatically be introduced, how those policies would be resourced and what type of legitimacy shifts they may entail. This research would need to move outside of the boundaries of the catchment into regional and national water resource management networks.

Glossary of terms

Blue Water

Blue water flow is the liquid water flow in the water cycle, consisting of surface flood flow and sub-surface recharge of groundwater.

Department of the Environment, Food and Rural Affairs

A government ministry, formed in 2001, which absorbed the role of the Ministry for Agriculture, Fisheries and Food (MAFF). DEFRA was allocated Environmental responsibilities on the break up of the Department for the Environment, Transport and the Regions (DETR) in 2001. Whilst DEFRA forms national environmental policy the deployment of those policies is the responsibility of the Environment Agency, the Office of Water Services and the Drinking Water Inspectorate.

Environment Agency

The Environment Agency (EA) was formed in April 1996 from former regulatory authorities whose remits included water pollution and waste disposal. One of the regulator's of freshwater in England and Wales, the EA's stated aim is to 'protect or enhance the environment as a whole, in order to play its part in attaining the objective of sustainable development'.

Governance Bodies

Governance bodies can be distinguished as formal or informal. Formal bodies, also called government bodies or authority groups, are created by Acts of Parliament, or derive their powers from Acts of Parliament. They derive their authority from formal

processes. An example of the former would be the Environment Agency, created by the Environment Act of 1995; an example of the latter would be the Middle Level Commissioners in the Fenland region of the catchment. Formal governance bodies would also include those bodies with a regulatory function, as these bodies are set up by Statute. Formal governance bodies concern themselves with the articulation of policy goals and the ratification and delivery of those policies.

Informal governance bodies are not created by statute, and are not formally part of central or local government. They may often be unelected i.e. their authority stems from a general recognition that they undertake work in areas not tackled by the government. This group includes those actors and groups who may have gained credibility for expert knowledge over time. Organisations which have proved their expertise, and so shown themselves to be essential to governance, include academic institutions, land management co-operatives and local campaign groups.

Green Water

Green water flow is the vapour flow in the water cycle over land, or total evaporation, consisting of vapour flow from foliage, open water, soil and biomass growth.

Input Legitimacy

Input legitimacy relates to the way in which a policy, institution or decision has been formed. Thus, constitution through law or public support would give an institution a strong input legitimacy. Similarly, a policy or decision which has a clear rationale, or was supported by public will, would also be deemed to have a high input legitimacy outside of its actual success at the implementation stage. Expertise developed over a number of years could also be significant in lending an organisation strong input

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legitimacy, even if this organisation sits outside of a formal framework, for instance a charity or NGO.

Integrated Water Resource Management

The co-ordinated management of land, water and other environmental resources for their equitable, efficient and sustainable use. Implicit to IWRM is water's role in human development as an economic good; this leads to a bias towards blue water concerns.

Internal Drainage Boards

Particular to England and Wales, Internal Drainage Boards (IDBs) are co-operatives formed to collectively take care of the drainage issues connected to a specific tract of land. Usually IDBs are formed by landowners to reduce the costs associated with drainage management. Revenue is generated by charging drainage fees to the local authority and through charging land developers. Costs include clearing ditches and drains and maintaining pumping stations. Occasional grants are provided by central government for the capital costs associated with replacing pumping stations. IDBs have some statutory powers provided by central government.

Legitimacy

Legitimacy can be understood as the concept that explains how authority operates in modern political economies. In other words, legitimacy enables people, processes and policies to function; transaction costs are subsequently lower in polities where legitimacy is well embedded.

Legitimacy Dialogues Model

Legitimacy dialogues are understood as the ways in which actors and institutions articulate positions on various issues. The selection of the term 'dialogue' is used here to explore what narratives, opinions, decisions and conversations allow change to be negotiated between different actors and institutions through verbal two way communication. Legitimacy refers to the desire of the actor or institution to persuade or convince others of the validity of their perspective. This thesis has isolated four pairs of legitimacy dialogue which creates a model of legitimacy dialogues. The aim of the model, as stated above, is to better understand how legitimacy interfaces between civil society and the state. In modern democracies the electorate has to be convinced of the rightness of change in a manner that also protects state longevity. The model seeks to explain how these different methods inculcate change and transformation in modern society.

Middle Level Commissioners

An umbrella organisation which represents all the internal drainage boards (see above) within the River Nene catchment. The MLC operates along the 'Middle Level' stretch of the river from Whittlesey, Cambridgeshire, north east to the St German pumping station in Cambridgeshire where the drainage system joins the River Great Ouse. Formed in the 17th century in response to the large scale land drainage that was being undertaken the MLC negotiate with County Councils and land developers to agree rates and with neighbouring IDBs to organise schedules of work.

Output Legitimacy

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Output legitimacy relates to the perceived success of the decisions that an institution takes, or equally the outcome of a policy or decision process. If they are generally deemed to be successful and well directed, then they will gain a great degree of output legitimacy.

Stakeholders

Actors, either individual or representing an institution, who have an interest or 'stake' in a particular process, decision or policy outcome.

Virtual Water

This concept explores how water stressed countries circumvent absolute water scarcity and ensure food security through food imports. Rather than diverting scarce water resources into irrigation fed agriculture these countries, diversify their economies away from producing food and into high performing sectors such as oil production, information technology and financial services. 'Virtual water' refers to the water it takes to produce the agricultural import. For example, it takes 1000 tonnes of water to produce 1 tonnes of wheat, so by importing 1000 tonnes of wheat a country can 'save' 1,000,000 tonnes of water and the additional infrastructure costs of storing, cleaning and distributing and administrating the provision of that water

Water Stress

Commonly defined as the relation between total water availability and withdrawals in comparison with total water availability is one way of measuring the degree of water stress within a country. Blue water withdrawals of 20% and above of the total available resource is one measure used by the United Nations to indicate technical water stress i.e. that a society may encounter technical difficulties in supplying more blue

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water. Social water stress has been sited, using the 'Falkenmark indicator' as being reached when a country is only able to mobilise 1700 cubic metres or less of freshwater per person per year. This has also been termed 'water crowding'. For a more thorough discussion see Chapter one.

Water Users

Termed within this thesis as actors and institutions that consume water and are subject to water policy. 'Water users' from this perspective include individual domestic users, industrial users, agricultural users, leisure users and organisations that lobby government such as environmental groups and farmer's associations.

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The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

Appendix 1

A copy of the questionnaire template used by interviewers in order to undertake a water management survey of domestic water users along the River Nene catchment (United Kingdom) in June and July 2003.

INTERVIEWER DECLARATION:

I hereby declare that this questionnaire has been completed within the MRS Code of Conduct and in accordance with the instructions supplied to me. I have carefully checked the questionnaire and am aware that it is subject to quality control procedures.

Interviewer's Name: _____
Signature: _____
Date of Interview: _____

INTERVIEWER ID

INTRODUCTION

Good morning/afternoon/evening. My name is from an independent research agency called RBA Research. We are carrying out a survey on behalf of Cranfield University and we would appreciate it if you could just answer a few questions.

(IF REQUIRED): *(It should take about 20-25 minutes to complete)*
(IF REQUIRED): *(The survey is trying to ascertain how people use water around the home and determine how much people know about the way water resources in the UK are managed)*

PLEASE NOTE: INTERVIEWER MUST ENSURE THAT THE RESPONDENT'S ADDRESS IS THEIR MAIN RESIDENCE I.E. THE RESIDENCE THAT THEY OCCUPY FOR THE MAJORITY OF THE YEAR. IN ADDITION, THE RESPONDENT MUST BE THE HEAD OF HOUSEHOLD OR THEIR PARTNER/SPOUSE

1. ENVIRONMENTAL CONCERNS

SHOWCARD A

Q1 *Amongst the issues listed, please select the two that concern you most at a national scale?
(CODE TWO ONLY)*

- Crime prevention/law & order..... 1
- Education..... 2
- Economy..... 3
- Employment 4
- Health & welfare 5
- Environment 6
- International politics..... 7
- Other (PLEASE SPECIFY)

Don't know.....9
 No answer.....0

Comments:

SHOWCARD B

Q2 *Thinking about environmental issues globally, amongst the issues listed, please select the two that concern you the most at a worldwide scale?*
 (CODE TWO ONLY)

Radioactive waste.....1
 Air quality /air pollution.....2
 Climate change.....3
 Deforestation/desertification.....4
 Reduction of biodiversity.....5
 Domestic wastes.....6
 Freshwater problems (water pollution/water
 scarcity/water flooding).....7
 Don't know.....9
 No answer.....0

Comments:

Q3 *Thinking about the area where you live what are the two most important issues that affect your local environment? By environment we mean the area in which you live – both the built environment and the natural environment?*
 (PLEASE WRITE IN THE TWO MOST IMPORTANT ISSUES)

1 _____
 2 _____

Comments:

SHOWCARD C

Q4 Which one of the following statements most closely reflects your views concerning water?
(CODE ONE ONLY)

- The main function of water is to satisfy human needs 1
- The main function of water is to support natural life 2
- Don't know 9
- No answer 0

Comments:

Q5 Water resource management is a term used to describe the way in which freshwater resources such as rivers, reservoirs and underground aquifers are managed by water companies and government bodies to ensure reliable, safe supply. In your opinion, is water resource management in your local area an issue that needs to be addressed....?

- ...with no urgency 1
- ...in the coming years 2
- ...urgently 3
- Don't know 9
- No answer 0

Comments:

Q6 In your opinion, please rate the overall quality of the water environment in your surrounding area. By water environment we mean the streams, rivers, lakes, reservoirs, canals and coastal areas close to where you live. I will ask you to tell me if each component is 'poor' 'acceptable' or 'good'. You can also tell me if it is not applicable in your area (e.g. if you're not near the coast)?

(READ OUT & CODE ONE FOR EACH)

Poor Acceptable Good N/A Don't know No answer

- a) Streams in your surrounding area 1 2 3 4 9 0
- b) Rivers in your surrounding area 1 2 3 4 9 0
- c) Lakes in your surrounding area 1 2 3 4 9 0

d) Reservoirs in your surrounding area.....12.....34.....9.....0

e) Canals in your surrounding area.....12.....34.....9.....0

f) Coastal areas in your surrounding area.....12.....34.....9.....0

Comments:

Q7 Would you say the overall quality of the water environment in your surrounding area in the last 10 years has...?
(READ OUT & CODE ONE ONLY)

- ...deteriorated 1
- ...stayed the same 2
- ...improved..... 3
- Don't know 9
- No answer 0

Comments:

2 INDIVIDUAL PERCEPTION & KNOWLEDGE OF WATER RESOURCE MANAGEMENT

Q9b Are you currently involved in any community activities? If so, please list.
(IF YES, PLEASE WRITE IN)

Yes..... 1
(PLEASE WRITE IN BELOW)

- No 2
- Don't know 9
- No answer 0

Comments:

Q8 *Would you like the opportunity to be involved in discussions and debates on the present and future management of water resources?*
(CODE ONE ONLY)

- | | | | |
|------------|---|-------|-----------|
| Yes | 1 | | GO TO Q9a |
| No | 2 | | GO TO Q11 |
| Don't know | 9 | | GO TO Q11 |
| No answer | 0 | | GO TO Q11 |

Comments:

Q9a *I will read out four different levels of participation that you can be involved in. Please tell me which one or ones you would prefer to be involved with?*
(READ OUT & CODE ONE FOR EACH)

- | | Yes | No | Don't know | No answer |
|---|-----|--------|------------|-----------|
| a) National level..... | 1 |2 |9 |0 |
| b) Regional level (South-east, South-west, Central, etc)..... | 1 |2 |9 |0 |
| c) County level (Northamptonshire, Cambridgeshire, etc)..... | 1 |2 |9 |0 |
| d) Local level (town council, parish council, etc)..... | 1 |2 |9 |0 |

Comments:

Q10 *You have stated that you would like to be involved in discussions and debates, through which type of method would like to participate? I will read out four different options and you tell me which one or ones appeal to you most. (read out & CODE ALL THAT APPLY)*

- | | |
|---|---|
| <i>Electing spokespersons to represent your opinion</i> | 1 |
| <i>Through participating yourself in public debates and public consultation</i> | 2 |
| <i>By being consulted and being asked to give an opinion about suggested propositions</i> | 3 |
| <i>By voting on options</i> | 4 |
| Other (PLEASE SPECIFY) _____ | |
| Don't know..... | 9 |
| No answer..... | 0 |

Comments:

3 INDIVIDUAL KNOWLEDGE OF THE DRINKING WATER CYCLE (READ OUT)

This next section of the questionnaire is looking at water use in the home. We are looking for your opinion and current water using practises – there are no right or wrong answers. When we say ‘household’ we refer to your household use generally. When we say ‘you’ we would like to know your response, rather than any other member of your household.

Q11 *Looking more closely at water resource management in your area, who is your household’s water supplier and, if different, who provides your sewerage services?*

(PLEASE WRITE IN BELOW. IF THE RESPONDENT DOES NOT KNOW, WRITE IN D/K)

a) *Water* (WRITE IN) _____

b) *Sewerage* (WRITE IN) _____

Don’t know 9

No answer 0

<i>Comments:</i>

Q12a *Do you know where the water you use in your household is taken from?*
(CODE ONE ONLY)

Yes 1 GO TO Q12b

No 2 GO TO Q13

<i>Comments:</i>

SHOWCARD D

Q12b *Please select from the list below the water resource from which your household water is taken from. Please select the main source only.*
(CODE ONE ONLY)

- Surface water (rivers, lakes, streams, reservoirs) 1
- Sea water 2
- Waste water treatment plant 3
- Underground water (aquifer, springs, boreholes, wells) 4
- Rainwater harvesting 5

Other (PLEASE SPECIFY) _____

Don't know 9
 No answer 0

Comments:

Q13a Do you know what happens to your wastewater once it leaves your home?
 (CODE ONE ONLY)

Yes 1..... GO TO Q13b
 No 2..... GO TO Q14

SHOWCARD E

Q13b Please select from the list below where your wastewater goes once it leaves your home? (CODE ONE ONLY)

Into a septic tank 1
 Directly into the environment (rivers, reservoirs, land fills) 2
 Into a waste water treatment plant: treated in "purification" systems before returning to the river system 3
 Into a waste water treatment plant: treated in "purification" systems before putting back in to the drinkable water system 4
 Into a waste water treatment plant: treated in "purification" systems before being used in irrigation 5
 Other (PLEASE SPECIFY) _____

Don't know 9
 No answer 0

Comments:

4 WATER USES & WATER QUANTITY

SHOWCARD F

Q14 Please select from the following five categories of water user in the UK, the two you consider to be the highest consumer of water by volume. Rank the highest two consumers only, using "1" for the highest consumer and "2" for the second highest consumer?
 (WRITE IN A "1" & "2" IN THE APPROPRIATE BOXES)

- Agriculture.....1
- Tourism (water use in hotels, self-catering apartments and villas and also second homes which are seasonally occupied).....2
- Industry.....3
- Households (domestic use).....4
- Leisure (water used to maintain golf courses, municipal gardens, parks and swimming pools).....5
- Don't know.....9
- No answer.....0

Comments:

Q15 *I will now read you a list of household activities that use water. Please list the number of times your household undertakes the following activities? (CODE 'NOT APPLICABLE' IF HOUSEHOLD DOES NOT HAVE THE ITEM)*

- | | <i>Number</i> | <i>Not
Applicable</i> | <i>Don't
know</i> | <i>No
answer</i> |
|---|--------------------------|---------------------------|-----------------------|----------------------|
| a) No. of times per quarter year you wash your car at home..... | <input type="checkbox"/> |97 |98 |99 |
| b) No. of times per week your household uses the washing machine | <input type="checkbox"/> |97 |98 |99 |
| c) No. of times per week your household uses the dishwasher..... | <input type="checkbox"/> |97 |98 |99 |
| d) No. of times per week your household uses full sinks of water to wash dirty dishes | <input type="checkbox"/> |97 |98 |99 |
| e) No. of litre bottles of water consumed by your household during one week | <input type="checkbox"/> |97 |98 |99 |
| f) No. of showers taken by your household during one week..... | <input type="checkbox"/> |97 |98 |99 |
| g) No. of adult baths taken in your household during one week..... | <input type="checkbox"/> |97 |98 |99 |

Comments:

Q16 Does your household have a garden (this includes a yard, patio, courtyard or terrace with plants, trees & flowers)?
(CODE ONE ONLY)

- Yes 1
- No 2
- Don't know 9
- No answer 0

Q18 Does your household water the garden?
(CODE ONE ONLY)

- | | | |
|------------|----------|------------|
| Yes | 1 | GO TO Q19a |
| No | 2 | GO TO Q21a |
| Don't know | 9 | GO TO Q21a |

Comments:

SHOWCARD G

Q19a What watering system does your household use to water the garden?
(CODE ALL THAT APPLY)

Q19b Of these, which watering system does your household use most commonly to water the garden?
(CODE ONE ONLY)

- | | <i>Q19a</i> | <i>Q19b</i> |
|---|-------------|-------------|
| Watering can..... | 1 | 1 |
| Hose pipe (including
pressurised hose
pipes)..... | 2 | 2 |
| Drip irrigation system..... | 3 | 3 |
| Spray irrigation system..... | 4 | 4 |
| Flood irrigation system..... | 5 | 5 |
| Rainwater butt/barrel | 6 | 6 |
| Other (PLEASE SPECIFY)_____ | | |
| Don't know..... | 9 | 9 |
| No answer..... | 0 | 0 |

Comments:

Q20a *On the days that your household does water the garden, can you estimate how much water you use?*
(CODE ONE ONLY & WRITE IN AMOUNT TO RESPONSE "1")

Yes 1..... GO TO Q20b

No 2..... GO TO 17a

Don't know 9..... GO TO 17a

No answer 0..... GO TO 17a

Q20b *What months of the year does your household generally apply water to your garden?*
(PLEASE WRITE IN)

Q17a *Does your household have an area additional or separate from a garden area where you grow vegetables, fruits or raise animals for your domestic use only?*
(CODE ONE ONLY)

Yes 1..... GO TO Q17b,c,&d

No 2..... GO TO Q21

Don't know 9..... GO TO Q21

No answer 0..... GO TO Q21

Q17b *Which of the following water supplies are you using to supply water for use in this area? (READ OUT & CODE ONE ONLY)*

A drinkable water network as your water supply 1

Another water supply system 2

Both 3

Q17c *What volumes of water do you use on a weekly basis (gallons, litres, buckets, etc)?(PLEASE WRITE IN)*

Q17d *What months of the year would you water this additional area?*
(PLEASE WRITE IN)

Q21 *In your opinion, do you think that your household consumes...?*
(READ OUT & CODE ONE ONLY)

- ...little water*..... 1
- ...neither too much nor too little water*..... 2
- ...a lot of water* 3
- Don't know 9
- No answer 0

Comments:

5 WATER USES, PERCEPTIONS OF WATER QUALITY

Q22 *Day to day, do you trust the quality of tap water supplied to your home?*
(CODE ONE ONLY)

- Yes 1
- No 2
- Don't know 3
- No answer 0

SHOWCARD H

Q23 *Thinking about the quality of the tap water supplied to your household, would you say you are...?*
(CODE ONE ONLY)

- ...well informed*..... 1
- ...neither well informed nor badly informed*..... 2
- ...badly informed*..... 3
- ...not kept informed at all*..... 4
- Don't know 9
- No answer 0

Comments:

SHOWCARD I

Q24a *Personally, would you say your tap water is...?*
(READ OUT & CODE ONE ONLY)

- ...very good quality* 1 GO TO Q25
- ...good quality* 2 GO TO Q25
- ...neither good quality nor poor quality* 3 GO TO Q25
- ...poor quality* 4 GO TO Q24b
- ...very poor quality* 5 GO TO Q24b
- Other (PLEASE SPECIFY) _____

- Don't know 9 GO TO Q25
- No answer 0 GO TO Q25

Q24b *For what reasons do you consider your tap water as poor quality?*
(DO NOT READ OUT & CODE ALL THAT APPLY)

- It is calcareous/hard and creates limescale 1
- It has a bad taste..... 2
- It smells of chlorine/it smells bad..... 3
- I believe it is polluted with nitrates 4
- I believe it is polluted with pesticides 5
- I believe it is polluted with lead..... 6
- Coloured 7
- Other (PLEASE SPECIFY) _____

- Don't know 9
- No answer 0

SHOWCARD J

Q25 *When you are at home, what type or types of water do you usually drink?*
(CODE ALL THAT APPLY)

- Tap water on its own 1 GO TO Q27
- Filtered tap water 2 GO TO Q27
- Bottled water (still) 3 GO TO Q26a
- Bottled water (fizzy) 4 GO TO Q26c
- Other (PLEASE SPECIFY) _____

- Don't know 9 GO TO Q27
- No answer 0 GO TO Q27

Q26a Can you list two reasons why you consume still bottled water at home?
(PLEASE WRITE IN)

Reason 1 _____

Reason 2 _____

Q26b Are the following explanations other possible reasons you consume still bottled water at home?
(READ OUT & CODE ONE FROM EACH)

	Yes	No	Don't know	No answer
a) I have no reason, it's just a habit of mine	1	2	9	0
b) Tap water is too poor in quality	1	2	9	0
c) Bottled water is an alternative drink to tap water – a different drink	1	2	9	0
d) Bottled water is good for health	1	2	9	0
e) I have a favourite brand of water (PLEASE SPECIFY BELOW)	1	2	9	0

ONLY ASK IF THE RESPONDENT DRINKS BOTTLED WATER (FIZZY). OTHERWISE GO TO Q27

Q26c Can you list two reasons why you consume fizzy bottled water at home?
(PLEASE WRITE IN)

Reason 1 _____

Reason 2 _____

Q26d Are the following explanations other possible reasons you consume fizzy bottled water at home? (READ OUT & code one from each)

	Yes	No	Don't Know	No answer
a) I have no reason, it's just a habit of mine	1	2	9	0
b) Tap water is too poor in quality	1	2	9	0
c) Bottled water is an alternative drink to tap water – a different drink	1	2	9	0
d) Bottled water is good for health	1	2	9	0
e) I have a favourite brand of water (PLEASE SPECIFY BELOW)	1	2	9	0

f) I like the texture1290

6 WATER PRICES AND RELATED BEHAVIOURS

Q27 *Is your household currently charged for water by a water meter installed in your home, or in your household block? (CODE ONE ONLY)*

Yes1
 No2
 Don't know.....9
 No answer.....0

Q28a *Could you estimate the daily average volumes of water used in your household?*

(CODE APPROPRIATELY & THE RESPONDENT CAN CHOOSE ANY WATER MEASUREMENT – LITRES, BUCKETS, ETC)

Yes (PLEASE WRITE IN BELOW) 1..... GO TO Q29
 No 2..... GO TO Q28b
 Don't know 9..... GO TO Q28b
 No answer 0..... GO TO Q28b

SHOWCARD K

Q28b *Which of the daily volumes of water shown, do you think your household uses? (code one only)*

Less than 50 litres of water.....1
 50 to 300 litres of water.....2
 300 to 600 litres of water.....3
 More than 600 litres of water4
 Don't know.....9
 No answer.....0

Comments:

(If the respondent is interested, DEFRA in 1997 estimated that we use approximately 149 litres per person per day. For a four persons household that makes 596 litres a day)

Q29 Can you recall the total amount of your last household water bill?
(DO NOT LET YOUR RESPONDENT GET THEIR BILL. CODE ONE ONLY)

- Yes 1..... GO TO Q30
- No 2..... GO TO Q31
- Not sure 3 GO TO Q31
- Don't know 9..... GO TO Q31
- No answer 0..... GO TO Q31

Q30a How much was the amount of your last household water bill (in pound sterling)? (PLEASE WRITE IN BELOW)

Q30b Does this cover a...? (READ OUT & CODE ONE ONLY)

- ...monthly charge 1
- ...quarterly charge..... 2
- ...annual charge 3
- Other (PLEASE SPECIFY) _____
- Don't know 9
- No answer 0

Comments:

SHOWCARD L

Q31a According to you, which of the following categories do you think your last household water bill falls into? (CODE ONE ONLY)

- Lower than £25 pounds 1
- Between £25 and £75 pounds..... 2
- Between £75 and £200 pounds..... 3
- Higher than £200 pounds..... 4
- Don't know 9
- No answer 0

INTERVIEWER OBSERVATION: DID THE RESPONDENT STRUGGLE TO ANSWER THIS QUESTION?

Q31b Does this cover a...? (READ OUT & CODE ONE ONLY)

- ...monthly charge** 1
- ...quarterly charge**..... 2
- ...annual charge** 3
- Other (PLEASE SPECIFY) _____
- Don't know..... 9
- No answer 0

Comments:

Q32 On the whole, do you think that the tap water supplied to your household is? (READ OUT & CODE ONE ONLY)

- ...cheap** 1
- ...neither cheap nor expensive**..... 2
- ...expensive** 3
- Don't know..... 9
- No answer 0

Comments:

Q33 Do you feel that in the last 10 years, the overall price of your household water bill has? (read out & code one only)

- ...gone up** 1
- ...stayed the same** 2
- ...gone down** 3
- Don't know..... 9
- No answer 0

Comments:

SHOWCARD M

Q34 If a pricing system based on peak use were to be introduced, would you be willing to consider using smaller amounts of water during peak hours and

instead switch most of your water use to off-peak times during the day and later at night if it saved you a quarter of your normal household water bill?
(CODE ONE ONLY)

- Yes 1
- No 2
- Don't know 9
- No answer 0

Comments:

Q35 *If your normal water bill was projected to increase by a quarter, do you think you would take measures to reduce your consumption?*
(CODE ONE ONLY)

- Yes 1..... GO TO Q36
- No 2..... GO TO Q37
- Don't know 9..... GO TO Q37
- No answer 0..... GO TO Q37

Comments:

Q36 *In the last question you agreed that you would reduce your household consumption to forestall a possible rise in your water bill. If you are prepared to help reduce your household consumption which two ways would you do this? (PLEASE WRITE IN BELOW)*

Method 1 _____

Method 2 _____

Comments:

SHOWCARD N

Q37 *Do you agree or disagree with the following statement: I would be willing to pay a small additional charge in my household water bill to directly support the protection of water in the environment?*
(CODE ONE ONLY)

- Strongly agree..... 1
- Agree 2
- Neither agree nor disagree 3
- Disagree 4
- Strongly disagree 5
- Don't know 9
- No answer 0

Comments:

Q38 *Would you be willing to accept lower water quality in your toilet with no effect on your normal household water bills if you knew it would be helping the environment? (CODE ONE ONLY)*

- Yes 1
- No 2
- Not sure 3
- Don't know 9
- No answer 0

Comments:

7 WATER SAVING BEHAVIOURS

SHOWCARD O

Q39 *Do you agree or disagree with the following statement: In my region water is very abundant: there is no need to save it. (CODE ONE ONLY)*

- Strongly agree..... 1
- Agree 2
- Neither agree nor disagree 3
- Disagree 4
- Strongly disagree 5
- Don't know 9
- No answer 0

Comments:

SHOWCARD P

Q40 Does the following statement reflect your own household experience: I make sure the washing machine and/or the dishwasher has a full load before starting them up? (CODE ONE ONLY)

- Rarely 1
- Sometimes 2
- Always 3
- Don't know 9
- No answer 0

Comments:

Q41 This next question is to find out what actions your household actually carries out to save water in the home. I will read out a list of activities. Please tell me if you 'always' 'never' or 'sometimes' do them or if you do not have the appliance mentioned in your home? (READ OUT & CODE ONE FOR EACH)

Always Never Sometimes N/A Don't know No answer

- a) Take care when watering the garden 1 2 3 4 9 0
- b) Take care when selecting the washing machine programme 1 2 3 4 9 0
- c) Take care when selecting the dishwasher programme 1 2 3 4 9 0
- d) Turn off the tap to avoid unnecessary use 1 2 3 4 9 0
- e) Replace bathing with showering 1 2 3 4 9 0
- f) Have installed a brick or water saving device in your toilet cistern 1 2 3 4 9 0
- g) Use the appropriate button/flush setting on a double button/double flush toilet 1 2 3 4 9 0

Comments:

8 PERCEPTION OF IN-HOUSE RECYCLING SYSTEM

SHOWCARD Q

This illustration shows a process called 'grey water reuse'. This system filters, treats and reuses bath and sink water (known as grey water) to flush your toilet and water your garden. This system can be installed into individual homes and into blocks of homes and can be located inside or outside beneath the ground. The cost of installation is around £2000 which will give you a return on your investment after 15 years. After this point you save money on your water bills. This lower quality water is perfectly safe but does not reach the very high standards needed for tap water.

Q42a *Given that this lower quality recycled water is safe would you be willing to install such a system in your house? (code one only)*

- Yes 1
- No 2
- Not sure 3
- Don't know 9
- No answer 0

Comments:

To understand better how you feel about this technology, I'm going to ask you in a little more detail what factors would encourage or discourage you from installing such a system in your home.

Q42b *Which of these following factors could influence you to install a 'grey water reuse system' in your home? (READ OUT & CODE ONE FOR EACH)*

- | | <i>Yes</i> | <i>No</i> | <i>Don't know</i> | <i>No answer</i> |
|---|------------|-----------|-------------------|------------------|
| a) It would reduce my household water use | 1 | 2 | 9 | 0 |
| b) It would reduce my household water bill | 1 | 2 | 9 | 0 |
| c) I try to recycle as much as possible at home already | 1 | 2 | 9 | 0 |
| d) It would enable me to use more water in the garden | 1 | 2 | 9 | 0 |
| e) It would encourage my family/others to care for the environment | 1 | 2 | 9 | 0 |

Comments:

Q42c *Which of the following factors could deter you from installing such a system?*

(READ OUT & CODE ONE FOR EACH)

	Yes	No	Don't know	No answer
a) Cost of installation	1	2	9	0
b) Inconvenience of the installation process	1	2	9	0
c) Bulkiess of the system when in place	1	2	9	0
d) Cost of maintenance/upkeep	1	2	9	0
e) Problems of odour management	1	2	9	0
f) Safety aspects of reusing water	1	2	9	0

Comments:

Water resource management has evolved over time with different bodies taking responsibility for different management functions. For example, water supply is the legal responsibility of the water companies; water quality is the overall responsibility of the Environment Agency and land use planning is managed by local councils.

Q43a Do you feel this separation of functions increases or decreases overall water resource management efficiency in the UK? (READ OUT AND CODE ONE ONLY)

(BY EFFICIENCY WE MEAN 'ABILITY TO GET A SET TASK ACHIEVED AS REQUESTED, ON SCHEDULE AND TO BUDGET')

Tends to increase efficiency	1
Has no effect on efficiency	2
Tends to decrease efficiency	3
Don't know	9
No answer	0

Comments:

Q43b Increases or decreases overall water resource management expertise in the UK? (READ OUT AND CODE ONE ONLY)

Tends to increase expertise	1
Has no effect on expertise	2
Tends to decrease expertise	3
Don't know	9
No answer	0

Comments:

Q43c *Improves or worsens overall water resource management planning in the UK? (READ OUT AND CODE ONE ONLY)*

- Tends to increase planning 1
- Has no effect on planning 2
- Tends to decrease planning 3
- Don't know 9
- No answer 0

Comments:

Q44 *Can you think of any laws, regulations or policies that you would like to see enacted with regards to water resource management on a national level? They could cover anything you think may be of importance, from water pricing, management systems, pollution, water storage development, water transfers or water efficiency? (PLEASE WRITE IN)*

Comments:

Q45 *Many homes in the UK have been adversely affected by flooding events. What do you think is the cause or are the causes of flooding? (PLEASE WRITE IN)*

Comments:

SHOWCARD R

Q46 *Whilst freshwater sources are finite, the UK population is steadily growing. Future forecasts indicate that although we have plenty of rainfall we may in time suffer water stress. In order to reduce water demand changes may have to be enforced. From the following list please indicate which you feel to be a legitimate policy change and which an illegitimate policy change in the context of growing water stress: (CODE ONE ONLY)*

	<i>Legitimate Policy</i>	<i>Illegitimate Policy</i>	<i>Don't know</i>	<i>No answer</i>
a) Free installation of water meters into all households by 2015	1	2	9	0
b) All new built homes from 2005 to have 6 litre rather than 13 litre capacity toilets.....	1	2	9	0
c) Private swimming pool owners to pay an additional annual 'water use' surcharge.....	1	2	9	0
d) Garden watering to only take place 7pm to 7am with on-spot fines for contravention	1	2	9	0
e) All households to have fitted grey water reuse systems by 2020.....	1	2	9	0
f) Trebling of household water charges by 2020.....	1	2	9	0

Comments:

9 SOCIODEMOGRAPHIC DATA

To complete the survey I now need to ask you some questions regarding the occupancy of your household.

Q47 *Country where fieldwork is being collected?*
(DO NOT READ OUT TO RESPONDENT)

Slovenia 1

The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

- Spain2
- France3
- United Kingdom4

Q48 *Region/County where fieldwork is being collected? (PLEASE WRITE IN)*

Q49 *Town/Village & Postcode where fieldwork is being collected? (PLEASE WRITE IN)*

Town/Village _____

Postcode _____

Q50 *What is the household composition ?*
 (UK ONLY RANK THE MAIN INCOME EARNER'S OCCUPATION)
 (PERMANENT RESIDENCE ONLY AND ONLY THOSE HOUSEHOLD MEMBERS WHO RESIDE PERMANENTLY I.E. 10-MONTHS OF THE YEAR)

	Age	Sex	International Standard Classification of Occupations ISCO-88 UK main income earner only Please refer to CARD 1
Interviewed Person			
Other household member			

Q51 *What is the type of living accommodation of the respondent's household? (CODE ONE ONLY)*

- Apartment/Flat.....1
- Semi-detached house2
- Detached house.....3

Terraced house.....	4
Maisonette	5
Bungalow.....	6
Other (PLEASE SPECIFY) _____	

Q52 *What is the type of ownership of the property? (CODE ONE ONLY)*

Owner occupiers.....	1
Tenants	2
Other (PLEASE SPECIFY) _____	
Don't know.....	9
No answer.....	0

Q53 *What is the total number of people living in your household? (CODE ONE ONLY)*

One	1
Two	2
Three.....	3
Four	4
Five	5
Six	6
Seven	7
Eight	8
Nine	9
Ten or more	10

THANK AND CLOSE

MAKE SURE THE FRONT PAGE DETAILS (incl. POSTCODE) ARE COMPLETE AND CORRECT

HAND OUT "THANK YOU" LEAFLET

The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

Appendix 2

A selection of 15 questions, drawn from the domestic water user survey, providing sub-catchment detail by comparing response from the top and bottom of the River Nene corridor.

Question 1: Sub catchment level analysis of the perceived urgency of local water management issues

Sub-catchment elements	Population		Catchment location	
	Urban	Rural	Upper	Lower
	%		Daventry	Wisbech
No urgency	29	19	41	26
In the coming years	55	56	43	55
Urgent concern	16	25	16	19
Total	100.0	100.0	100.0	100.0

Urban/ rural

The table (above) illustrates that both urban and rural respondents have similar response profiles, with the majority of response cataloguing IWRM as an issue for the 'coming years' (urban 55%; rural 56%). A respondent is more likely to treat IWRM with 'no urgency' if s/he is an urban dweller (29% as opposed to 19% for rural respondents) – and more likely to treat it as an urgent issue as a rural dweller at 25% rather than 16% as an urban respondent. This suggests that location has an influence on the degree to which a respondent thinks IWRM is 'urgent' or 'non urgent'. Rural dwellers tend towards a greater degree of 'urgency'. The greater majority of people are, however, apathetic.

Daventry/Wisbech

Concentrating on response from the top (Daventry) and bottom of the catchment (Wisbech) 16% and 19% (respectively) of respondents believed there was an 'urgency' to IWRM concerns. Compared with a Northampton response of 24% it is possible to infer that direct experience of IWRM problem, such as flooding, could have a lasting influence on attitudes to water governance, though these may not be as acute as could be anticipated.

Those at the top of the catchment are also more likely to view IWRM as 'non urgent' (41%) compared to 25% at the bottom; this indicates a tendency upstream to view IWRM as unproblematic.

Question 2

Sub-catchment level analysis of the perceived change in quality of the local water environment over the past decade

Sub-catchment elements	Population		Catchment location	
	Urban	Rural	Upper	Lower
	%	%	Daventry	Wisbech
Deteriorated	13	22	15	7
Stayed the same	63	52	62	67
Improved	24	26	23	26
Total	100.0	100.0	100.0	100.0

Around a quarter of all response felt that the water environment had improved.

Urban/rural

Comparing urban and rural responses (see the table above) the majority of respondents believe that the quality of the water environment has 'stayed the same' at 63% and 52% respectively with rural respondents slightly less content. Rural respondents are much more likely than urban respondents to say that the water environment has 'deteriorated' with a difference of 9%, with rural responses at 22% and urban responses to this option at 13%.

Daventry/Wisbech

This rural response is three times higher than the perception of deterioration voiced by Wisbech residents, with only 7% feeling that the water environment has 'deteriorated' – half as many as Daventry respondents. This highlights that spatial location can have a marked difference on perception of one's water environment. Unlike question 1, Daventry residents are more concerned with the local water environment than are Wisbech residents. Yet for question 1 both Daventry and Wisbech residents felt in the main that IWRM was 'non urgent' and also believed that the water environment had 'stayed the same' – indicating coherence between answers.

Question 3

Sub-catchment level analysis of the perceived change in quality of the local water environment over the past decade

Sub-catchment elements	Population		Catchment location	
	Urban	Rural	<i>Upper</i> Daventry	<i>Lower</i> Wisbech
	%		%	
Yes	6	5	5	3
No	94	95	95	97
Total	100.0	100.0	100.0	100.0

The response profile across all four categories is very similar with the vast majority of respondents not wishing to participate in the management of water resources.

Question 4

Sub-catchment level analysis of the perceived use of water resources by sector

Sub-catchment elements	Population		Catchment location	
	Urban	Rural	Upper Daventry	Lower Wisbech
	%		%	
Agriculture	24	27	13	53
Tourism	7	7	24	3
Industry	46	26	45	28
Households	19	36	18	15
Leisure	4	4	0	0
Total	100.0	100.0	100.0	100.0

Urban/Rural

Looking first at urban and rural response (see the table above) there are great differences in the perception of volumetric water use per sector. Urban respondents select industry, agriculture and household use in descending order – with agriculture taking up almost half the percentage points at 46%. Rural respondents selected households, agriculture and then industry as their top three. This is surprising inasmuch that agriculture is the dominant water user sector within the catchment.

One would expect to find rural respondents, living in an agriculturally dominant catchment, to be aware of this fact.

Daventry/Wisbech

The top three sectors for Daventry respondents are industry with 45%, followed by tourism and households. Again, it is surprising that tourism should receive almost a quarter of responses, particularly given that there is no significant tourism sector surrounding Daventry. Also surprising is that agriculture receives only 13% of response. When one compares responses to Wisbech's 53% for agriculture it is possible to appreciate that there is a vastly different perception of sectoral water use along different sections of the catchment. As table x shows, Wisbech is located in Fenland where agriculture dominates so this figure is explicable, but Daventry's low response rate is hard to fathom, given that it is a town surrounded by arable and dairy farming.

This data analysis exercise demonstrates that regional perception can be widely varied even within a single river catchment; with all four response categories ranking a different selection of water using sectors.

Question 5

Sub-catchment level analysis of the perceived change in quality of the local water environment over the past decade

Sub-catchment elements	Population		Catchment location	
	Urban	Rural	Upper Daventry	Lower Wisbech
	%	%	%	%
Yes	90	83	84	100
No	10	17	16	0
Total	100.0	100.0	100.0	100.0

Urban/rural

A respondent is more likely to trust water quality as an urban dweller (90 % of the sample) than as a rural dweller (83%) – 7.2% more. This demonstrates some discrepancy in perception of the level of trust in water supply standards.

Daventry/Wisbech

Comparing upstream and downstream responses, Daventry's response profile is similar to that of rural respondents. Wisbech meanwhile demonstrates total trust in potable water supply with a 100% positive response rate. Looking forward to questions 10, 11 and 12 we can see that this attitude towards water governance bodies is replicated in numerous responses, with Wisbech more content with service levels than Daventry residents.

Question 6

Sub-catchment level analysis of the perceived level of communication of water companies concerning quality of potable water

Sub-catchment elements	Population		Catchment location	
	Urban	Rural	Upper Daventry	Lower Wisbech
	%	%	%	%
Well informed	34	21	24	43
Neither well nor				
Badly informed	39	37	34	41
Badly informed	9	20	5	7
Not informed at all	18	22	37	9
Total	100.0	100.0	100.0	100.0

Urban/Rural

Both rural and urban dwellers are ambivalent about feeling informed – the majority of responses are in the 'neither kept well informed nor 'badly informed' category. Yet twice as many rural dwellers feel they've been kept badly informed (22%) than urban dwellers (9%). Rural dwellers are also more likely to feel that they are 'not kept informed at all' than urban dwellers (rural 22%; urban 18%). Generally then, urban dwellers are more content with information dissemination strategies than are rural dwellers. The majority of both groups feel they are 'neither well informed nor badly informed'.

Daventry/Wisbech

Returning to the findings of question 5, the research demonstrates that satisfaction with water governance bodies is affected by spatial location. In this response set 43% of Wisbech residents felt they were 'well informed' compared to only 24% of Daventry residents – a difference of almost 21%. This is also reinforced when we compare the 'not informed at all' category; in this category only 9% of Wisbech respondents were dissatisfied compared with 37% of Daventry residents; four times as many. The data highlights that surveys which generalise at the catchment level do not isolate differences within the river corridor.

Question 7

Sub-catchment level analysis of the perceived quality of supplied potable water

Sub-catchment elements	Population		Catchment location	
	Urban	Rural	Upper Daventry	Lower Wisbech
		%		%
Very good quality	24	12	21	23
Good quality	61	61	45	70
Neither good nor bad quality	10	11	23	7
Poor quality	5	15	8	0
Very poor quality	0	1	3	0
Total	100.0	100.0	100.0	100.0

Urban/rural

Both rural and urban respondents demonstrate then high levels of satisfaction ('good'/'very good') with urban at 85% and rural at 73%. Both rural and urban respondents catalogued their tap water as 'good quality' with a high response rate of 61%. Urban respondents were twice as likely as rural respondents to classify their water as 'very good quality', with almost a quarter of all urban responses in this option, again reflecting responses shown in question 6.

Daventry/Wisbech

These satisfaction rates are very different for Daventry and Wisbech respondents, with levels of 66% and 93% respectively. No Wisbech respondents felt that their tap water was of poor or very poor quality. Again the data seems to reflect generally higher levels of water service satisfaction

by Wisbech residents than with Daventry residents - as shown in questions 6, 7, 10, 11, 12.

Question 8

Sub-catchment level analysis of the perceived relative cost of potable water

Sub-catchment elements	Population		Catchment location	
	Urban	Rural	Upper Daventry	Lower Wisbech
	%		%	
Cheap	20	23	19	24
Neither cheap nor expensive	63	54	61	57
Expensive	17	23	20	20
Total	100.0	100.0	100.0	100.0

Urban/Rural

The results above show that there is a similar response profile from urban and rural respondents to this question, though rural residents are slightly more prone to perceiving prices as more expensive than urban respondents.

Daventry/Wisbech

Daventry and Wisbech respondents have a similar response profile.

The data would seem to suggest that the issue of price of household water bills is a universal concern and is not affected by location along the catchment.

Question 9

Sub-catchment level analysis of the perceived relative change in cost of potable water over the past decade

Sub-catchment elements	Population		Catchment location	
	Urban	Rural	Upper	Lower
			Daventry	Wisbech
	%		%	
Gone up	67	78	59	69
Stayed the same	27	18	35	29
Gone down	6	4	6	2
Total	100	100	100	100

Urban/Rural

More rural than urban householders felt that prices had 'gone up' (78%:67%); more urban than rural perceived prices to have 'stayed the same' (27%:18%).

Few respondents from the sample thought that prices had decreased.

Daventry/Wisbech

In this response set it is the Wisbech residents that are more likely to feel that household water bills have risen (69% response) compared with Daventry

respondents (at 59%). Given that the tendency within these sub questions has been that Daventry respondents are more prone to expressing dissatisfaction this is an unusual response profile amongst a trend.

Question 10

Sub-catchment level analysis of the perceived effect of increasing separation of functions on water resource management's efficiency

Sub-catchment elements	Population		Catchment location	
	Urban	Rural	<i>Upper</i>	<i>Lower</i>
			Daventry	Wisbech
	%		%	
Increases efficiency	27	22	19	35
No effect on efficiency	26	28	19	44
Decreases efficiency	47	50	62	21
Total	100	100	100	100

Urban/Rural

It is clear from table above that the response profiles for urban and rural respondents are almost identical. This informs the research that issues of efficiency are not shaped by agendas that are specifically urban or rural in nature.

Daventry/Wisbech

Although there is no difference between perception of efficiency in urban or rural locations, if one looks more closely at upper and lower catchment responses there is a marked difference. Here upstream respondents (Daventry) view a separation of water management functions as having an acute negative impact on perceived efficiency with 62% of Daventry respondents citing 'decreases efficiency' as a response; this is a threefold increase compared to Wisbech respondents. The majority of Wisbech respondents felt that the changes had 'no effect' on efficiency.

It is possible to infer from this set of responses that not only is efficiency a concern to respondents upstream, but that there is a general view that efficiency has declined since privatization (the point at which the English and Welsh water management regime developed separate regulatory and management functions). Yet this is not a catchment wide perspective as the Wisbech response demonstrates. Given that the same regulators and water company operates along the catchment the perception could either be linked to site specific experiences or to the way in which issues handled at that geographical location are perceived.

Question 11

Percentage response concerning the perceived effect of increasing separation of functions on water resource management's expertise

Sub-catchment elements	Population		Catchment	
	Urban	Rural	Upper Daventry	Lower Wisbech
	%		%	
Increases expertise	33	32	22	35
No effect on expertise	28	36	22	50
Decreases expertise	39	32	56	15
Total	100	100	100	100

Urban/Rural

Reviewing the results detailed in the table above it is again clear that catchment location has an effect on response profile. Urban respondents show more concern that expertise has diminished since privatisation than rural respondents with a 7% difference in response.

Daventry/Wisbech

When we compare this to catchment location the difference is greatly exaggerated with a difference of 41%. Upstream residents are almost four times more likely to feel expertise has decreased than downstream residents, with Daventry at 56% and Wisbech at 15%. As with question 10 the scale of this difference, which cannot be predicted from looking at other factors such as housing type, income, household number etc, reveals that catchment location will have a major impact on how a respondent perceives and relates to water governance bodies as a water user. These themes are dealt with more depth in the discussion section 6.12. The research reveals that looking at customer satisfaction at a catchment scale will not reveal sub catchment tensions.

Question 12

Percentage response concerning the perceived effect of increasing separation of functions on water resource management's performance

Sub-catchment elements	Population		Catchment	
	Urban	Rural	Upper Daventry	Lower Wisbech
	%		%	
Improves management	29	31	31	32
No effect on management	30	32	31	47
Hampers management	41	37	38	21
Total	100.0	100.0	100.0	100.0

Urban/Rural

Looking at the issue of impacts on management of a separation of functions, compared with question 10 and 11's respective concerns of efficiency and expertise, it would be anticipated that this may generate more acute differences in response. However as the table above shows again the response profiles of urban and rural respondents are very similar.

Daventry/Wisbech

Compared to questions 10 and 11 the catchment location specific responses are less exaggerated than seen in question 10 and 11. Negative responses from Daventry respondents drop from 56% to 38%, though this is still almost twice the level of Wisbech respondents in the same response category (21%). For most Wisbech residents the separation of functions has had no effect on management. This response could suggest that the organizations themselves are not seen as somehow lacking, but that the staff or the policies they implement are subject to criticism. Further qualitative research would be needed to qualify this inference.

Question 13

Percentage response concerning differences in desired laws and policies for improving water resource management

Sub-catchment Elements	Population		Catchment	
	Urban %	Rural	Upper Daventry	Lower Wisbech %
Pollution control	44	18	20	31
Lower prices	4	12	16	0
Protect flood plains	7	2	0	6
Storage facilities	9	22	36	44
Repairs/Maintenance	9	12	4	6
Enforced metering	5	0	0	0
Other	22	34	0	13
Total	100	100	100	100

Urban/Rural

Open response questions are notoriously difficult to analyse objectively and so care must be taken when analysing the responses to this question so as not to make inferences which are not supported by the data. A comparison between urban and rural respondents show that pollution control is by far the greatest concern for urban respondents, whilst for rural respondents water storage facilities is the most significant concern (this ignores the 'other' category which has disparate replies).

Daventry/Wisbech

Wisbech and Daventry respondents replicate the concerns of rural residents with 44% (Wisbech) and 36% (Daventry) citing water storage facilities as their most desired new policy, both followed by pollution restrictions.

Question 14

Percentage response identifying causes of flooding.

Sub-catchment Elements	Population		Catchment	
	Urban	Rural	Upper Daventry	Lower Wisbech
	%	%	%	%
Global warming	27	14	22	16
Flood plain building	41	48	27	46
Heavy rainfall	8	10	16	8
Drainage problems	14	20	21	16
Poor flood defense	2	4	3	3
Poor water management	3	2	5	0
River bank maintenance	2	0	3	3
Other	3	2	3	8
Total	100	100	100	100

Urban/Rural

As with question 13, these open response questions are a useful way of understanding the diversity of opinions held by respondents. Urban respondents view flood plain development followed by global warming and drainage problems as the three key indicators of flooding; rural respondents also see flood plain building as the main culprit but see drainage problems as much more influential than global warming. Urban respondents are almost twice as likely to cite global warming as a problem than rural respondents (27%:14%).

The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

Daventry/Wisbech

Looking at upstream and downstream responses both Daventry and Wisbech reflect the urban response of flood plain, global warming and drainage whilst Wisbech residents are far more concerned about flood plain development than those in Daventry (46%:27%). This may be due to differences in planning issues at both locations or the influence of topography. Returning to question 12, it is interesting to note that 'poor water management' has a nil response for Wisbech though a 5% response for Daventry, reflecting concerns voiced in questions 6,7,10,11 and 12.

Question 15

Percentage response at a spatial scale judging the legitimacy of possible future policy

Initiatives to reduce water demand

Spatial Scale	Population		Catchment	
	Urban	Rural	Upper Daventry	Lower Wisbech
		%		%
<u>Enforced water metering</u>				
Legitimacy	85	91	92	85
Illegitimacy	15	9	8	15
Total	100	100	100	100
<u>Reduced toilet size</u>				
Legitimacy	83	87	81	87
Illegitimacy	17	13	19	13
Total	100	100	100	100
<u>Swimming pool surcharge</u>				
Legitimacy	93	93	92	92
Illegitimacy	7	7	8	8
Total	100	100	100	100
<u>Garden watering curfew</u>				
Legitimacy	78	71	89	71
Illegitimacy	22	29	11	29
Total	100	100	100	100
<u>Enforced grey water reuse</u>				
Legitimacy	29	9	33	39
Illegitimacy	71	91	67	61
Total	100	100	100	100
<u>Triping water bills</u>				
Legitimacy	12.	9	5	30
Illegitimacy	88	91	95	70
Total	100.0	100.0	100.0	100.0

Responses to question 15 fall under six sub-questions. Each of these, listed one to six, are reported below with individual analysis.

1) Enforced metering

Urban/Rural

Looking at the table above we can see that rural respondents (at 91%) are more in support than urban respondents (at 85%) to enforced water metering as a water demand policy, though there is a high degree of support from both.

Daventry/Wisbech

Daventry respondents have the highest positive response rate across all four groups at 92%. Given their responses to questions 10 to 12, it would be expected that Daventry respondents may be more cautious of supporting new policy given their opinion that they feel expertise, efficiency and management capacity have all declined. Wisbech residents mirror those of urban respondents.

2) Reduced toilet cistern capacities

Again looking at the table above overall support across all four response categories is high.

Urban/Rural

Compared with enforced metering (q15 (i)), urban support of reduced cistern size as a legitimate policy option drops by 2% to 83%. Rural support drops by 4% in comparison with question 15(i) to 87% in support of this policy option.

The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

Daventry/Wisbech

Unlike 'enforced metering' Wisbech respondents are more supportive that reduced cistern capacity is legitimate than Daventry respondents at 87% and 81% in support respectively. Daventry drops its positive support compared to enforced metering by 10% to 81% in favour whilst Wisbech rises in comparison by 2%.

No clear inferences can be made from these results.

3) Swimming pool surcharges

Urban/Rural

Both urban and rural respondents have identical responses to this question with 93% in support of swimming pool surcharges for private owners (see the table above). This is the highest 'legitimacy' response across all six policy option categories.

Daventry/Wisbech

These responses are mirrored by Daventry and Wisbech respondents who again both have identical responses and who provide the highest legitimacy responses across all six question categories.

4) Day time watering curfew

There is a marked decline across all four respondent types in support of day time watering curfews as a legitimate policy, though all four mainly support it (see the table above)

Urban/Rural

For urban respondents, compared with question 15 (iii), support for the policy declines by 14% and drops by 21% by rural respondents to 78% and 71% respectively.

Daventry/Wisbech

However, Daventry respondents maintain very high levels of support for the policy with 89% of respondents in support, a drop of only 3% compared with the swimming pool surcharge policy suggestion. Yet Wisbech response mirrors rural response and drops by 21% to 71% in favour – a difference of 18%. This indicates significant cultural differences between Daventry and Wisbech respondents.

5) Enforced grey water reuse

This policy suggestion is the first one in which 'illegitimacy' replaces 'legitimacy' as the most favoured response (see the table above).

Urban/Rural

Just over two thirds of urban respondents deem it illegitimate at 71% compared to 91% of rural respondents, marking this as an extremely unpopular policy suggestion. The 20% difference shows how markedly different receptivity can be orientated by spatial location alone.

Daventry/Wisbech

Daventry and Wisbech residents seem less disinclined to reject the policy with 33% and 39% positive response respectively. The 6% difference between the two is interesting, though the data does not support any theory as to why this should be.

6) Trebling of water prices

This final policy category (see the table above) is, as anticipated, the most unpopular of all six.

Urban/Rural

Urban and rural respondents show a similar profile with 88% and 91% respectively viewing the policy as illegitimate.

Daventry/Wisbech

The responses of the Daventry and Wisbech residents are very interesting. Daventry respondents clearly view a trebling of water bills as untenable with 95% deeming it illegitimate. This declines by 25% to only 70% of Wisbech residents. Wisbech residents are therefore more willing to consider increasing domestic water prices as a way to reduce demand than are Daventry respondents. This is a large difference between two sections of the catchment and again reflects wide disparities in receptivity to policy.

Appendix 3

A copy of the initial letter sent in August 2004 to selected water user associations and water governance bodies operating along the River Nene catchment inviting them to participate in an interview to discuss strategic planning with regards to water stress scenarios.

Mrs Mary Gearey
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August 4th 2004

Dear Mr X,

My name is Mary Gearey and I am a researcher with the School of Water Sciences at Cranfield University, working on a European Union project called AQUADAPT. I am writing to ask if you would lend your experience and knowledge to the project by agreeing to a brief interview at your convenience.

The AQUADAPT project is now in its third year of operation and is a collaborative, cross-disciplinary piece of work between Cranfield University and twelve other research institutes across Europe. The overall objective of this project is to generate knowledge which supports the strategic planning and management of water resources under changing conditions of water availability and water quality, otherwise termed 'water stress'.

My role within the project is to look specifically at how far different organisations within England and Wales are able to co-ordinate, integrate and adapt to increasing water stress in the coming years. This includes both those organisations already involved within the realm of water governance and those who are likely to be impacted by water stress. My research explores the current set of relationships between water regulators, water companies, government ministries, NGOs, local community groups and water users and attempts to identify what types of change can and should happen to lessen possible impacts of water stress.

In order for me to make my research as comprehensive as possible I am writing to ask you if you would be prepared to be interviewed with regards to water governance within the catchment of the River Nene. Your expertise within the IWA is invaluable, and your contribution will add both depth to the detail of the research and help us achieve the project aims. I am conducting my interviews in person during September and October this year, with

The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

each interview lasting no longer than 45 minutes at your place of work. If you are willing to see me I can provide you with a more detailed project outline regarding AQUADAPT, together with a list of my proposed interview questions. I enclose a stamped addressed envelope for your response.

I do hope that you can take the time to support the AQUADAPT project – the website can be found at www.aquadapt.net should you wish to take a look. If you would like to talk to me about the interview my contact details are above. I look forward very much to hearing from you.

Yours faithfully,

Mary Gearey

.....

Mr X
Yes, I am available for interview. Ideal date/s.....am/pm

No, I am not available but can recommend an alternative interviewee:

Name:.....Job Title.....

Contact details:.....

Please tear off this slip and return in the stamped addressed envelope provided

The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress.

Appendix 4

A follow-up letter sent in September 2004 to the selected water user associations and water governance bodies operating along the River Nene catchment asking them to consider participating in the strategic planning interview.

Mrs Mary Gearey
School of Water Sciences, Building 39
Cranfield University
MK43 0AL
m.gearey@cranfield.ac.uk
September 6th 2004

Dear Mr X,

I do hope you received my letter to you sent August 4th 2004. I have not received a reply from your organisation concerning my invitation to you to be interviewed as part of the AQUADAPT project.

Would you be kind enough to let me know if you, or a representative of your organisation, may be free for interview in September or October this year?

I appreciate that my contact with you has an air of 'cold-calling' but in order to produce research which is relevant and useful Cranfield University seeks to involve as many stakeholders as possible. This is why your contribution is so relevant. Of course, all discussions and interview notes will remain anonymous and confidential throughout.

The results of the AQUADAPT project will be to produce discussion and policy recommendation documents for the European Union's use for reflection upon the aims and implementation of the Water Framework Directive. Your contribution will be significant and greatly valued.

If you are willing to see me I can provide you with a more detailed project outline regarding AQUADAPT, together with a list of my proposed interview questions.

I do hope that you can take the time to support the AQUADAPT project – the website can be found at www.aquadapt.net should you wish to take a look. If you would like to talk to me about the interview my contact details are above. I look forward very much to hearing from you.

Yours sincerely,

Mary Gearey

.....

<input type="checkbox"/>	Mr X
<input type="checkbox"/>	Yes, I am available for interview. Ideal date/s.....am/pm
<input type="checkbox"/>	No, I am not available but can recommend an alternative interviewee:
	Name:.....Job Title.....
	Contact details:.....

Please tear off this slip and return in the stamped addressed envelope provided

Appendix 5

A follow-up thank you letter sent in September 2004 to the water user associations and water governance bodies who agreed to participate in the strategic planning interview

Mrs Mary Gearey
School of Water Sciences, Building 39
Cranfield University
MK43 0AL
m.gearey@cranfield.ac.uk
September 14th 2004

Dear X,

Many thanks for returning the reply slip and agreeing to participate in an interview.

You mentioned that the dates 11th to 14th October in the morning suit your diary. Can I suggest I am on Wednesday 13th October? If there are any problems you can either email me at the above address or call me on 01234 210936.

In order to save us time on the day, and so that you know what questions I will be asking, I enclose my interview agenda, plus some comments on Cranfield University's ethical research policy which ensures that all interviews are anonymous and confidential. If you need further clarity on any of the above issues, please do not hesitate to contact me.

I would be most grateful if you could provide me with directions so that I can find your office and also a telephone number in case of any problems.

Thanks once again for your help and I look forward very much to meeting you.

Mary Gearey

Appendix 6

The question template sent to respondents prior to the strategic planning interviews conducted during September and October 2005

Flooding scenario

1) From your organisation's perspective what causes flooding along the River Nene?

2) What are the possible solutions to flooding along the catchment?

3) Who or what should provide these solutions – and is this institutional mix currently in place?

4) What prevents or hampers this institutional mix from developing solutions? (e.g. time, expertise, financial resources, communication channels).

5) What does your organisation believe needs to be done at the catchment level to lessen the risk of flooding?

Rapid development scenario: Milton Keynes quadrangle

1) Do you think that the proposed rapid urban development will have a significant impact on the river and, if so, why?

2) What will be the benefits and costs (e.g. environmental, social and financial) at catchment level of such development along the river?

3) Which organisations are championing these development plans?

4) Does your organisation feel the appropriate people and institutions at catchment level have been consulted and involved in the strategic planning stage?

5) What outcomes would your institution like to see with regards to this proposed Milton Keynes quadrangle scheme?