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# Communities, Institutions and Flood Risk: Mobilising Social Capital to Enhance Community Resilience

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**COMMUNITIES, INSTITUTIONS AND FLOOD RISK:  
MOBILISING SOCIAL CAPITAL TO ENHANCE  
COMMUNITY RESILIENCE**

By

**ANDREW FOX**

A thesis submitted to Plymouth University  
in partial fulfilment for the degree of

**DOCTOR OF PHILOSOPHY**

School of Geography, Earth and Environmental Sciences

**March 2014**



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## **Abstract**

**Andrew Fox**

### **Communities, institutions and flood risk: mobilising social capital to enhance community resilience**

Over recent years, community resilience has been increasing in popularity as a topic for detailed study. During that time, academic researchers have been working to untangle the complex network of social relationships that define the concept. In parallel, some institutions have set the achievement of enhanced community resilience as a policy goal. This research has sought to assist in both areas: first, by contributing to the academic debate and second, to build a clearer understanding of how institutions can tailor policies to ensure success in their goal of enhancing community resilience.

A case study approach was adopted for the research, centring on three communities in the Teign Estuary of South Devon (Newton Abbot, Teignmouth and Shaldon). All three communities were vulnerable to tidal flooding and links between the communities and institutions responsible for managing flood risk (FRM framework) were analysed. In the analysis, a specific form of social capital was studied: social capital derived from community-institution links (CISC). CISC was found to be effective in revealing links with the greatest potential to enhance the resilience of communities against flood risks.

To assess resilience at the individual and community level, a maturity based model was used. The assessment found disparities between how resilience matures at the community level compared to the individual level. Specifically, resilience maturity in communities was revealed as a less linear process. As such, the case study communities were able to exhibit traits associated with low resilience maturity at the same time as exhibiting traits associated with high resilience maturity.

This research concluded that the UK FRM policy framework was robust, aligning well with academic theory. However, the FRM system was revealed as being dominated by expert elites. These elites are mainly public sector based and were judged to be stifling the engagement of the private sector at the local level. To enhance their resilience, this study determined that communities need to investment in CISC, but that investment must not just be targeted at public sector FRM institutions alone, it also needs to target private sector FRM institutions.



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## Acronyms used in the thesis

ABI	Association of British Insurers
ADA	Association of Drainage Authorities
AHVLA	Animal Health and Veterinary Laboratories Agency
BGS	British Geological Survey
BRC	British Red Cross
BRE	Building Research Establishment
BSI	British Standards Institute
BW	Bushell Ward, Newton Abbot
BW	British waterways
CABE	Commission for Architecture and the Built Env
CC	Countryside Commission
CIOB	Chartered Institute of Building
CIRIA	Construction Industry Research and Information Association
CISC	Community Institution Social Capital
CLBA	Country Land & Business Association
CN	CoastNet
D&CC	Devon and Cornwall Constabulary
DCC	Devon County Council
DCLG	Department of Communities and Local Government
DEFRA	Department of Environment Food and Rural Affairs
DFiD	Department for International Development
DfT	Department for Transport
DSFRS	Devon and Somerset Fire and Rescue Service
DTI	Department for Trade and Industry
EA	Environment Agency
EC	European Commission
EEA	European Environment Agency
EFRA	Environment, Food and Rural Affairs Committee
EH	English Heritage
EU	European Union
FC	Forestry Commission
FMSF	Flood Management Stakeholders Forum
FPA	Flood Products Association
FRM	Flood Risk Management
FUTERRA	Climate Change Communications Working Group
GDS	Government Decontamination Service
HA	Highways Agency
HMG	Her Majesty's Government
HMT	Her Majesty's treasury
HPA	Health Protection Agency
HSE	Health and Safety Executive
ICE	Institution of Civil Engineers
IHT	Institution of Highways and Transportation
iRec	Information and Research for Reconstruction Network
LGA	Local Government Association
LRF	Local Resilience Forum
MAFF	Ministry of Agriculture Fisheries and Food
MCA	Maritime and Coastguard Agency

MO	Met Office
MoD	Ministry of Defence
NA	Newton Abbot case study community
NATC	Newton Abbot Town Council
NCCE	Nature Conservancy Council for England
NE	Natural England
NFF	National Flood Forum
NFU	National Farmers Union
NHBC	National Home Builders Council
NHS	National Health Service
NKDT	Newton Abbot and Kingsteignton Devon Town
NPA	National Parks Authority
NVCC	National Voice of Coastal Communities
ODPM	Office of the Deputy Prime Minister
OFWAT	The Water Services Regulatory Authority
PPG25	Planning Policy Guidance note 25
RISC	Royal Institute of Chartered Surveyors
S&SW	Shaldon and Stokeinteignton Ward
SH	Shaldon case study community
SPC	Shaldon Parish Council
SPRC	Source, Pathway, Receptor and Consequence model
SWAS	South West Ambulance Service
SWGO	Government Office for the South West (abolished)
SWRBLP	South West River Basin Liaison Panel
SWRDA	South West Regional Development Agency (abolished)
SWRFDC	South West Regional Flood Defence Committee
SWSHA	South West Strategic Health Authority
SWW	South West Water
TAC	Technical Advisory Committee
TCC	Teignmouth Town Council
TDC	Teignbridge District Council
TEW	Teignmouth East Ward
TM	Teignmouth case study community
UKCIP	UK Climate Impacts Programme
UN	United Nations
WALL	HR Wallingford
WC	Water Company
WMO	World Meteorological Office
WO	Welsh Office

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Of course it is not over, I look forward to building on what I have started here and am actively thinking of ways I can continue this work with Geoff and Stephen (the supervisor team)....it never really ends....

## Author's Declaration

At no time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award without prior agreement of the Graduate Committee.

Work submitted for this research degree at the Plymouth University has not formed part of any other degree either at Plymouth University or at another establishment

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Signed:



Date:

20<sup>th</sup> July 2014

# Chapter 1 Introduction

## 1.1 Background to the study

This thesis marks the culmination of more than a decade of work by the author. As a practising Civil Engineer, the author was directly involved in the design and development of community housing projects both in the UK and overseas from the late 1980s through to the end of the 1990s. It was during overseas deployments in the 1990s that the author was exposed to communities directly affected by flood hazards and that experience sparked a desire to learn more about ways in which communities can be made more resilient to such events.

In 2001, the author was given the opportunity to begin research into the field of disaster management at Coventry University. From that time, ideas for this thesis began to take shape, but were significantly strengthened when the author began engaging with the Canadian based iRec group. The iRec group promoted research that sought to improve systems used in post-disaster reconstruction and helped the author formalise many of his early ideas (Fox 2001, 2002a, 2002b, 2004a, 2004b, 2004c, 2004d). Working with the iRec group, the author first formulated the elements of a system to improve the resilience of communities (Fox 2002c, Fox *et al.* 2003). This framework provided the basis for research that preceded this thesis and which focussed on understanding community resilience by examining communities exposed to flood risk along the River Severn.

When assessing the Bewdley community in Shropshire, the author came to realise that resilience within communities can change over time, fluctuating within a cycle that may span generations (Fox 2005a). This work emphasised the link between resilience and social memory, a topic taken further by the Sustainable Flood Memories project (ESRC n.d., and McEwan *et al.* 2012). Also in 2005, the author's

work with the Emergency Planning Society, Human Aspects Group (Fox 2005b) and the Hazard Forum (Fox 2005c) focussed his attention on the relations between communities and institutions responsible for managing hazards that afflict communities. Lessons drawn from these preliminary studies indicated that community-institution relations had the potential to impact on levels of community resilience, but there was a lack of published literature available exploring that relationship.

In 2007, the author re-located to the University of Plymouth and was introduced to the works of Wilson (2007 and 2012) and Essex (Essex and Brayshay 2007, Vernon *et al.* 2005), which revealed the potential for linking many of the ideas developed by the author about community resilience with development policy and the social capital concept. In 2008, the author was registered for a PhD at the University of Plymouth and work began in earnest to bring all of the above mentioned threads of research into one coherent thesis.

Over the years that the author's interest in the subject of community resilience grew, others have also taken an interest in the subject (Boughton 1998, Buckle 2002, Coles 1998, Hennessy 1998, HMG 2005a and 2005b). That interest has revealed the challenge that academic authors encounter when attempting to distinguish the ephemeral and complex constituents that define the resilience concept.

Simultaneously, organisations and other social institutions have been working to embed community resilience into their policies and programmes (Kendra and Wachtendorf 2003, Macrae 1995, Mallak 1998, Manyena 2006, Tobin and Whiteford 2002). In this thesis, the author has sought to assist in both these areas by strengthening the existing theoretical framework that defines community resilience

and by building a clearer understanding of how community resilience can be engendered by appropriately tailoring institutional policies. This contribution is derived from a detailed exploration of four key concepts that underpin this thesis, namely; community, social institution, social capital and resilience.

Community, as a concept and a subject for study, has been popular with researchers and theorists for millennia and a significant body of knowledge has developed around the understanding of the term “community” (Bauman 2001, Bell and Newby 1971, Crow and Allan 1994, Day 2006, Delanty 2003). Researchers have defined communities as dynamic networks, engaging individual actors in an active or a passive manner (Tonnies 1935, Anderson 1991). Their dynamism is not simply symbolic of their levels of activity, but also refers to their tendency to vary in size, structure, cohesiveness and even in their levels of self-awareness (Amit 2002, Buckle 1999, Gottdeiner and Budd 2005, Hennessy 1998, Marsh and Buckle 2001).

This thesis explores in detail four different communities:

1. The community comprising institutions responsible for managing flood risk in the UK (FRM framework).
2. Three case study communities situated on the banks of the Teign Estuary in South Devon and all at risk from tidal flooding (Newton Abbot, Teignmouth and Shaldon).

As this thesis is interested in relationships between communities and institutions, the concept of a social institution is an important one to understand. Hence, this thesis explores the literature and theories that define social institutions. Social institutions are generally viewed as “objects”, created when communities undergo a process of institutionalization (Day 2006, Hassard 1993, Hill 2000, Mayhew 1982, Scott 2001, Wicks 2001). The institutionalization process starts with the normalisation of

behaviours and values within a community and is then followed by the creation of roles and procedures that are used to regulate actions of community members (Barley and Tolbert 1997, Hage and Hollingsworth 2000, Scott 2000, Scott and Meyer 1994, Wicks 2001). Social institutions, thus created, are just as dynamic as communities, but their regulatory and bounded nature manifests this dynamism differently. Institutional dynamism is characterised by internal and external pressures experienced by institutions, pushing them to adopt stronger or lesser degrees of institutionalization. Those pressures may even force an institution to deinstitutionalize or segregate (Barley and Tolbert 1997, Berger and Luckmann 1966, Hodgson 1988). Within this thesis, lessons taken from flood risk policy documentation and interviews with institution representatives are applied to help understand the workings of institutions that make up the UK Flood Risk Management (FRM) framework. A questionnaire survey was used to reveal the extent of institutionalisation to address the local flood risk within each case study community. These separate study areas were combined to reveal lessons about the interaction between FRM framework institutions and community based institutions, lessons helpful in enhancing community resilience.

Both communities and social institutions are important areas for the creation of a particular form of social capital that is of interest to this thesis, namely social capital derived from community-institution links (CISC). Social capital is derived from links between two parties, often accompanied by the creation of an obligation owed by one party to the other (Bourdieu 1977, Coleman 1990 and Putnam 1993). Some authors (Holt 2008, Kilpatrick and Abbot-Chapman 2007, Lin 2001, Mohan and Mohan 2002, Radcliffe 2004) consider that social capital can also be enhanced by the addition of other capital resources, for example human, physical, economic and

cultural capitals. At the collective level, social capital is described as embedded in the connections within and between communities and institutions (Bourdieu 1977 and 1993, Coleman 1990, Putnam 1993, Dawkins 2006, Dekker 2007, Kaasa and Parts 2007, Tansley and Newell 2007). As is common in social network analysis, this thesis analysed the social capital in all four communities using social network diagrams, or sociograms (Knoke 1990, Marin & Mayntz 1991, Schneider 1991, Scott 2000). For the FRM framework community, the diagram was constructed using data gathered from policy documents and supplemented by interview data. For the case study communities, the data was gathered using a questionnaire survey. The social capital analysis was used to reveal CISC, derived either from community members with links to community based institutions, or from links between the communities and FRM framework institutions. From the revealed CISC, an understanding was developed of ways that FRM institutional policies could be modified to enhance community engagement, to provide a community with data about structural weaknesses that hamper its ability to address local flood risk issues and to illustrate where a lack of CISC limits how effectively the community can engage with FRM institutions.

To complete the investigation of community resilience in this thesis, the concept of resilience itself is subject to detailed scrutiny. Resilience is manifest in actions taken by community actors to mobilise resources in order to recover from stressful events (Bosher *et al.* 2008, Chaskin 2008, Coleman and Hagell 2007, Jacelon 1997, Paton 2000, Pickett *et al.* 2004, Seaman 2005, Woods 2006, Wreathall 2006). It is described as both a process and an outcome and operating at individual and collective levels in societies (Cairns 2002, Dolan 2008, Manyena 2006, Paton and Johnson 2001, Pickett *et al.* 2004, Turner and Pidgeon 1997). In this thesis, a

maturity model, developed from studies of the process that enables resilience to develop in individuals, is applied to the case study communities. The application of the maturity model revealed that the process of building resilience at the community level matures differently when compared to the maturity of resilience in individuals. In particular the maturity of resilience in communities is revealed as being less linear than in individuals.

The resilience maturity assessment was combined with findings from the community, social institution and social capital analysis to develop proposals that both FRM institutions and flood risk communities could use to enhance community level resilience. At the individual level, outcomes of the resilience building process, in the form of traits that reveal positive resilience potential, were assessed using the community questionnaire. The results of the assessment were used to develop a generic profile of community members with potentially more or less than average resilience. These profiles were then combined with results from the community, social institutions and social capital data to analyse the potential of different eight individuals to occupy a FRM coordinating role within each of the case study communities. Collectively, the community level study and the individual level illustrated how community-institution social capital can be used to enhance community resilience.

## **1.2 The research gap**

The literature underpinning this thesis revealed that the four core concepts are significant areas of enquiry in their own right, with several academic disciplines contributing to the evolving understanding of the concepts. From the world of human geography stem a number of sub-disciplines, including economic, political and social

geography, whose outputs provide a framework for understanding communities, resilience and social capital (Benko and Strohmayer 2004, Berg 2003, Cloke *et al.* 1991, Daniels *et al.* 2001, Knox and Pinch 2000, Rogers and Viles 2003). Sociology and Anthropology provide two other well-established frameworks for understanding social structures and the mechanisms by which social resources are mobilised (Della Porta and Diani 1999, Crossley 2002, Giddens 1984, Lopez and Scott 2000, Tarrow 1994). From psychology are derived the principles for understanding the human traits and behaviours required to create resilience in individuals, organisations and communities (Jacelon 1997, Paton and Johnson 2001, Paton 2003a and 2003b, Paton *et al.* 2000). In philosophy, the processes by which cognitive ideas are manifest into social objects are elaborated and defined (Bergen and Luckmann 1966, May and Williams 1998, Searle 1995).

What the themes of community, social institutions, social capital and resilience all share is that they are all human constructs: “things that exist only because we believe them to exist” (Searle 1995, p.1). They are creations of the human mind, without which there is no evidence of their existence in the physical world. It is perhaps that strong common cognitive aspect that has opened-up the four concepts to contributions from such a wide range of academic disciplines. All the disciplines of geography, sociology, anthropology, psychology and philosophy have strong but distinctly different cognitive traditions and it is that multitude of theoretical traditions that hints to the opportunity for new research. For, whilst each academic field has added to the depth of understanding of the four key concepts, the contention within this thesis is that each discipline is ploughing ever-deeper, but divergent furrows of knowledge. There is scant evidence of research that applies an approach drawing together material from the multitude of academic disciplines to study community

resilience. In addition, whilst the constituents of social capital are widely accepted, there is little in the published literature that focuses on Community-Institution Social Capital (CISC) and its role in improving community resilience. By addressing those gaps in existing knowledge, this research will provide valuable new understanding that will enhance both academic and practitioner perspectives on community resilience.

### **1.3 Flood hazards as a focus for the study**

Flooding was judged by the author to be an appropriate hazard around which to build a study investigating community resilience. There is evidence that community resilience has become an important objective within the overall strategy for their management (ESRC *n.d.*, HMG 2004, McEwen *et al.* 2012, Demeritt 2012) and flood events themselves also stand out as a major cause of concern at the global level. At the global level, floods are increasing in both frequency and severity, so the results of any study that aims to better understand how communities can improve their resilience to flooding will be worthwhile (Demeritt and Norbert 2011, EA 2001, EC 2004, MAFF 2001, MAFF/WO 1993, WMO 2004).

Floods are also well suited to this study as they result in a complex mix of structural, environmental and psychological impacts on their victims, and their management requires the input of a diverse collective of institutions and expertise to be effective (Demeritt 2012, Demeritt and Norbert 2011, Hamill 2001, Lancaster *et al.* 2004, Pappenberger *et al.* 2013, Porter and Demeritt 2012, Wilson 1983). On a spatial level, floods can be short-duration localised events or long-duration international events, often spanning administrative and political boundaries and creating significant social and organisational complexity that challenges any existing policies

that designed enhance community resilience (DEFRA 2004, Demeritt 2012, Demeritt and Norbert 2011, McEwen *et al.* 2012, Pilon 2002, TAC 2000). The complexity of the flood risk management system provides ample justification for the development and application of a unified conceptual research framework that aims to better understand how the resilience of communities to flood risk can be enhanced.

#### **1.4 Aim and objectives of the study**

At this stage in the thesis, it is important to state the aim and the objectives of the study.

##### **Aim:**

This thesis will examine the concept of community resilience by exploring the relationship between institutions involved in flood risk management and communities at risk from flooding. The aim is to develop a deeper understanding of how institutions and communities can engender and mobilise CISC to enhance community resilience.

##### **Specific objectives:**

- To draw together the separate threads of academic discourse focussing on community, social institutions, social capital and resilience into a single coherent framework for investigation and thereby deepen the established understanding of how these four concepts work together to create community resilience.

- To explore how the social and institutional systems for the management of flood hazards in the Teign Estuary area of South Devon, interact for the purpose of enhancing community resilience.
- To evaluate how UK Flood Risk Management (FRM) institutions and the case study communities create and utilise CISC in a manner that enhances the resilience of the communities to flood risk.
- To assess how a deepened understanding of community resilience based on an assessment of CISC can be used to improve FRM policy and decision-making and also to guide future academic research.

## **1.5 Structure of the thesis**

Chapter 2 of the thesis reviews the literature surrounding the four main concepts of resilience, community, social institutions and social capital. After providing a detailed evaluating of the literature relating to each concept separately, the chapter draws together the individual outcomes from the separate evaluations into a research framework. The collective framework was then used as a basis for developing the research methodology, outlined in Chapter 3. In Chapter 3, the broad approach to the research is contextualised within the tradition of research associated with the subject of geography. A rationale is also provided in further support of the decision to use a case study approach, the flood risk scenario and the selection of the case study communities. In addition, the techniques used to collect and analyse data are elaborated.

Chapters 4, 5, 6 and 7 are detailed discussion chapters, each focussing on one of the key concepts. Chapter 4 focusses on social institutions and presents details of

both the organisational framework in the three case study communities and the institutional FRM community. The first parts of Chapter 4 are highly descriptive, providing essential detail about the structure of the four communities prior to a more detailed academic examination. The latter parts of Chapter 4 analyse a number of issues drawn from the social institution literature, issues that play a significant role in developing a deeper understanding of community resilience. In Chapter 5, issues drawn from the community literature are explored in depth. Chapter 6 focusses on social capital, reviewing data collected from the study communities to create the community sociograms and allowing CISC to be identified and analysed. Chapter 7 acts as a synthesis chapter, bringing together lessons learned in Chapters 4, 5 and 6 to build a deeper understanding of the community resilience concept and, in particular, how community resilience can be enhance using CISC. The final chapter, Chapter 8, summarises the main findings of the research and assesses the contributions made by the thesis to both academic and practice networks.

## **Chapter 2. Literature review**

## 2.1 Introduction

This chapter presents an analysis of literature that defines the current understanding of four key concepts underpinning this thesis. Specifically, the concepts of resilience, community, social institutions and social capital will be explored in more detail. The literature reviewed includes a historical perspective, drawing upon references from much of the last century and, in some cases, as far back as the mid nineteenth century. The historic perspective is used to chart the evolution of current understanding, but also to enable some distinction to be drawn between “traditional” and “modern” ways of thinking. The distinction between traditional and modern is judged by the author to be significant, as this research will be investigating established communities and institutions where historic traditions may still have a strong influence over modern patterns of behaviour.

In Section 2.2, literature relating to the concept of resilience is analysed. For ease of understanding, the literature is divided into three sub-groups. The first sub-group includes literature that explains resilience as both a process and an outcome. The second sub-group outlines lessons for this research derived from authors in the field of disaster management. The final sub-group includes literature that examines how resilience is developed at the individual, community and institutional levels.

Section 2.3 addresses the literature surrounding the concept of community and the analysis is divided into four parts. The first part explores what the author describes as the “modern traditional” perspective on the community concept. The next part considers challenges to the modern traditional concept that have arisen over the last century. In the third part of the analysis, the author examines how a divide has

emerged between academic and institutional versions of the community concept. In the final part, recent critical refinements to the community concept are reviewed.

The next section, Section 2.4, summarises the literature relating to social institutions and the analysis is divided into three sections. The first section analyses literature that focusses on the process of institutionalisation and the second section expands on that analysis by focussing on a sample of the literature that explains how the process of institutionalisation is linked to the manifestation of social institutions as objects in the real world. The final section adds a different perspective, by exploring social institutions through the body of literature associated with organisational research.

Section 2.5 examines the last of the four key concepts, namely social capital. The review of the social capital literature is broken down into four elements. The first element outlines how the concept of social capital has been popularised in recent decades. The second element reviews literature that examines the different scales at which social capital can be manifested. The third element explains how social capital can be engendered and mobilised and the fourth element illustrates how indelible markers of social capital in the records left by communities can enable researchers to retrospectively assess the social capital of a community.

Within each main section, the author concludes the analysis of the literature by highlighting lessons of importance for this thesis. At the end of the chapter, ideas from the four separate bodies of literature are merged to reveal a comprehensive set of issues that the author will take forward for further detailed examination in subsequent chapters.

## **2.2 Resilience**

### **2.2.1 Section outline**

Resilience is the concept that underpins this thesis and, in this section, the reader will be introduced to a selection of published material that broadly describes current thinking about the concept. The material on resilience is presented in three sections. First, the author explains how the literature on resilience is divided into two themes: one dealing with processes that help to build resilience (Cairns 2002, Doron 2005, Woods 2006 and Wreathall 2006) and another that focusses on the outcome of the resilience building process (Coleman and Hagell 2007, Mallak 1998, Ramutsindela 2007). The second section analyses lessons about how to improve the resilience of disaster prone communities, drawing on literature from the field of disaster management (Anderson and Adey 2012, Boshier *et al.* 2007, Dore and Etkin 2003, Kendra and Wachtendorf 2003, Macrae 1995, Paton *et al.* 2000, 2001, 2003a and 2003b, Tobin and Whiteford 2002). Finally, theory relating to resilience at the individual, community and institutional levels is assessed to judge its importance in relation to the aims of this thesis (Cairns 2002, Chaskin 2008, Dolan 2008, Doron 2005, Rodima-Taylor *et al.* 2012, Seaman *et al.* 2005 and Wilson 2012).

### **2.2.2 Resilience building processes and outcomes**

The concept of resilience is said to have originated in the field of ecology and was popularised by studies in the fields of psychology and psychiatry, but it is now used by so many disciplines that researchers have found its meaning to have become blurred (Cote and Nightingale 2012, Manyena 2006; Wreathall 2006, Pickett *et al.* 2004). Generally, researchers agree on the fundamentals that define resilience,

namely that it is a common trait developed from the operation of human adaptation systems and which relates to the ability to endure and recover from a period of stress (Chaskin 2008, Coleman and Hagell 2007, Jacelon 1997, Kendra and Wachtendorf 2003, Paton *et al.* 2000, Pickett *et al.* 2004, Seaman 2005, Woods 2006, and Wreathall 2006). On delving deeper into the resilience literature, a divide becomes evident between researchers who have focussed on systems that enable adaptation (process focussed research) and those that focus on the ability to endure and recover from a crisis (outcome focussed research).

The distinction between “process” or “outcome” focussed research is well explained by Pickett *et al.* (2004) who identified that the resilience concept has emerged from two conceptual models relating to social equilibrium and social non-equilibrium. In the social equilibrium model, resilience is demonstrated by the ability to return to the original state after a disruptive event (outcome). In the social non-equilibrium model, there is no return to the previous state, rather resilience is demonstrated in the ability to change and adapt in response to crisis events (process).

From a process perspective, Woods (2006) pointed out that all systems are continually adapting to challenges on a daily basis. Doron (2005) illustrated some of those processes in action through her study of Lebanese refugee families. She found that a coping (adaptive) capacity was essential for creating and strengthening personal, familial, social and organisational resilience. For Doron, adaptation helped to create resilience by engendering a sense of belonging, control over situations, an optimistic perspective and a sense of proportion to change. However, adaptation was also helpful when learning new skills and in creating strong value, belief and support systems (*ibid*). This thesis will use evidence of adaptations by communities

exposed to flood risk as indicators of processes at work to improve the community's resilience.

Studies like those of Doron (2005) reinforce the idea that a resilience building process should not simply be defined in terms of normal adaptive processes. Rather, a resilience building process should be defined as one that enables systems to adapt to events outside of their "normal adaptive capacity" (Woods 2006). For Woods (2006), the use of such a definition naturally draws attention to identifying the boundaries of current competence and to understand what dynamics challenge or go beyond the "competency envelope". Cairns (2002) would describe Wood's point as an "obverse" distinction, marking a major change in traditional perspectives on the management of risk. Wreathall (2006) explained this distinction, describing how traditional systems for the management of risk focus on the process of understanding a hazard, but the resilience approach focuses on performance indicators. For Wreathall, processes focussing on the resources needed to absorb harm and decision-making in times of crisis are more suited to a resilience methodology. The extent to which both the Flood Risk Management (FRM) community and the case study communities have moved beyond traditional systems to expand their "competency envelope" will be explored in greater detail in this thesis.

From the outcome perspective, adequate functioning after exposure to a crisis event was described by Coleman and Hagell (2007) as a simple way of demonstrating a resilience outcome. Such a definition is too vague to offer practical guidance for this research, but it does help to distinguish between an active demonstration of resilience and the potential to be resilient. This research is built around communities exposed to a coastal flood hazard in the UK, and coastal flood events that threaten

the resilience of a community are rare. As a consequence, active demonstrations of resilience are not very evident, so it is important for this research to be able to discern the “potential resilience” of a community. This thesis will analyse evidence of the outcomes from resilience building processes to judge the potential resilience in a community.

Mallak (1998) identified six factors (outcomes) to help identify potentially resilient individuals, communities and institutions. Specifically they all:

1. Are goal directed and enjoy improvising solutions.
2. Display scepticism of new situations that helps them to avoid problem and chaotic situations.
3. Possess a critical level of understanding that makes them effective in using information.
4. Exhibit a low level of role dependence with an ability to fill in easily for missing individuals.
5. Demonstrate a preference for multiple sources when assessing the reliability of data.
6. Demonstrate the ability to access resources.

Coleman and Hagell (2007) identified three other outcomes, which are indicators of potentially resilient individuals:

- High self-esteem
- Sound mental health
- Good social competence

What the studies of Mallak (1998) and Coleman and Hagell (2007) illustrate is that indicators of potential resilience can be displayed by a wide array of traits. What they are less clear on is if these traits are satisfactory on their own or must be collectively present to create a resilient outcome for an entire community. This research will seek

evidence to assess if these traits work in isolation or collectively in potentially resilient communities.

Added to the deliberations outlined above, a study by Ramutsindela (2007) illustrated a paradox inherent in the duality of the two views of resilience (process and outcome). His study examined post-apartheid land reform in South Africa's former Bantustans, where he expected to find widespread transformation of the territorial configurations after the collapse of apartheid. Instead he found that reforms had not succeeded and judged that it was because the apartheid system had created boundaries that were firmly entrenched in the social geography of the areas. Local institutions and the property regimes of the territories were so resilient that they resisted adaptation. The paradox illustrated here is that the greater the resilient outcome, the harder it may be for external organisations to implement a resilience building process. Ramutsindela's research suggests that there may be a level beyond which resilience building becomes counterproductive. Such a negative view of resilience and the idea of a limit on its effectiveness are distinctly lacking in the established literature. Therefore, this research will gather evidence to assess whether "over resilience" is an issue or not in the management of UK flood risk.

### **2.2.3 Lessons about resilience from disaster management**

As stated above, this research has chosen to explore resilience within the context of communities exposed to flood hazards. The particular area of interest for this research is how institutions tasked with managing the flood hazard assist communities to develop resilience. Within the flood hazard research community, some of the main protagonists promoting the resilience concept come from the field of disaster management (Anderson and Adey 2012, Dore and Etkin 2003, Kendra

and Wachtendorf 2003, Macrae 1995, Paton *et al.* 2000, 2001, 2003a and 2003b, Tobin and Whiteford 2002).

Some disaster management researchers have come to a view that the “traditional disaster management system”, as used by many institutions involved in the management of flood hazards, is response-driven and overly focussed on activities undertaken in the immediate aftermath of a crisis (Bosher *et al.* 2007, Oven *et al.* 2012). In recent years, traditional response-driven approaches have been augmented by risk and vulnerability reduction programmes (Bosher *et al.* 2007). That augmentation was an effort to improve pre-disaster planning. However, several studies have shown that such an approach still lacks a sufficiently broad spectrum of activity to achieve any lasting impact on hazard prone communities (Allen 2003, Homan 2003, Kendra and Wachtendorf 2003, Manyena 2006, Paton *et al.* 2000, 2001 and 2003a, Pelling 2003, Thomalla *et al.* 2006, Wilson 2012). A study, conducted by Tobin and Whiteford (2002), which focussed on Ecuadorian communities displaced by an erupting volcano, illustrates this point well. The study found that disasters had a “therapeutic effect” on the communities in the immediate aftermath of the crisis, resulting in a raised sense of solidarity and altruistic behaviour, but the effect did not last long. To Tobin and Whiteford (2002), a resilience based approach was seen as providing a longer recovery perspective that would greatly enhance traditional systems.

Community risk and vulnerability reduction programmes were popular in the latter part of the last century, as a means of augmenting traditional disaster management systems. However, researchers found that those programmes often focussed on factors that were external to the community, factors over which communities have

little or no control (Alexander 2000, Turner and Pidgeon 1997, Quarantelli 1998, Toft and Reynolds 1997). In such cases, risk and vulnerability augmentation programmes were insufficient to build resilience. To achieve lasting improvements in community resilience further augmenting was judged to be needed, with policies that focus on the adequate functioning of internal community and institutional processes during and after a crisis (Oven *et al.* 2012). For this research, a useful synopsis of this thinking was provided by Boshier *et al.* (2007), who defined a contemporary resilience building system as including the principles of risk and vulnerability reduction, applied over a broad time horizon spanning pre-disaster planning to post-disaster recovery and encompassing both internal and external processes. That definition will be used to guide the analysis of the systems used to build resilience in the case study communities investigated by this thesis.

Homan (2003) raised another issue that may be considered relevant to this research, namely, that recent developments in social constructivist thinking have emphasised a greater plurality of understandings of the world. In social constructivist thinking, multiple viewpoints are not just relevant, but desirable in the development of resilient management systems. Homan identified disaster management as an area where the multiple viewpoints approach is needed, describing it as an area where “policy has traditionally been dominated by a singular vision espoused by an expert elite” (Homan 2003, p.152). According to Homan, the multiple viewpoint approach is the most appropriate one to deal with disasters and there is evidence that this view is taking root within public/government policy. That trend is epitomised by the collective responsibility approach to emergency planning in the Civil Contingency Act 2004 (Anderson and Adey 2012). More importantly, the public policy framework for implementing the multiple viewpoint approach is explicitly based upon the resilience

concept (HMG 2003, 2004, 2005a and 2005b). The Civil Contingency system in the UK sees resilience as both created and enhanced through collective action (Amaru and Chhetri 2013, HMG 2004 and Fox 2008). The issue of whether systems for managing flood risk in the case study communities are truly embracing such a collective approach, or are still dominated by expert elites will be explored further in this thesis.

At the same time that disaster managers in the public sector are warming to the idea of resilience building system with a pluralist foundation, so too are disaster managers in the private/commercial sector. Pickett *et al.* (2004) demonstrated this effect when helping urban designers, environmental and social scientist in their attempt to improve the resilience of city environments. They wanted to exploit what they termed the “potency” of dialogue between private communities and public institutions, thereby enabling a better understanding of the linkages between structure (how the system is put together) and process (how the system works). In addition, both Hollnagel *et al.* (2006) and Boshier *et al.* (2007) described public/private collaborations in efforts to improve safety in the engineering sector. Those collaborations were promoted under the banner of improving the resilience of individuals and organisations and demonstrate to this research, how it may encounter a multitude of overlapping public and private sector initiatives aimed at improving community resilience. The challenge for this project will therefore be to assess if the resultant complexity is helping or hindering the creation of resilience in communities.

#### **2.2.4 Individual, community and institutional resilience**

As the concept of resilience has taken hold, many authors are recognising that links between individuals, communities and institutions are important in building resilience (Cairns 2002, Chaskin 2008, Dolan 2008, Doron 2005, Rodima-Taylor *et al.* 2012, Seaman *et al.* 2005, Wilson 2012). For example, Doron (2005) found that individual resilience helps to deal with trauma and acute stress, but when dealing with long-term stress, any lasting recovery is directly related to the level of community resilience. To Dolan (2008) when individuals seek to develop useful relationships (in their effort to build personal resilience) institutions provide the support that aids the development of relationships and communities provide the context where these connections and relationships are made.

When researching resilience in individuals, investigators make a distinction between three stages in the development of resilience: child, adolescent and adult (Cairns 2002, Coleman and Hagell 2007, Jacelon 1997, Mallak 1998, Paton and Johnson 2001, Seaman *et al.* 2005). The three stage maturity process may be summarised as follows:

**Child level resilience** - To Jacelon (1997), a triad of traits are needed to build child level resilience, including a positive, active and reflective personality with strong cognitive skills, a caring adult or close family, and a strong external institutional support system for both the child and the carers. Cairns (2002) added that building child level resilience includes the adaptation to solitude (as a conscious being separate from the world around them) and the development of compassion for the needs of others.

**Adolescent level resilience** - As the child moves into adolescence, resilience is further developed by exposure to more acute or multiple risks. At the adolescent level, the individual is allowed to experience adversity and protective factors are tailored to address the particular risk environment to which the adolescent is exposed (Coleman and Hagell 2007, Seaman *et al.* 2005).

**Adult level resilience** - For Mallak (1998), the process of developing adult level resilience must include exposure to an acute or disintegrating experience followed by a reorganisation or reintegration phase. Mallak went further, outlining three adult level sources of resilience. First was the ability to create order out of chaos, to work under pressure, to access resources and to balance the fight/flight reaction. Second was an attitude of wisdom, or the ability to mobilise past experience with an attitude of scepticism/curiosity. Third was a virtual role system, or a measure of how well the adult understands their own role and that of others within the community.

This three stage maturity model for assessing resilience will be used in this thesis to judge the level of “resilience maturity” in each of the case study communities.

Moving away from the individual to the community level, community resilience is demonstrated by the capability of the community to draw upon internal resources and its competency in managing challenges it encounters (Hollnagel *et al.* 2006).

According to Paton and Johnson (2001), enhancing resilience at the community level requires three conditions to be met, namely:

1. Safeguarding the physical environment.
2. Maintaining economic and organisational integrity.
3. Ensuring individuals can access and use resources.

In a further study, Paton (2003b) added that, in order to maintain resilience over a prolonged period of time, community members must be motivated to respond to a disaster, encouraged to formulate intentions and convinced to take action. Evidence of these competencies and intentions will be important when judging the level of resilience in the communities studied as part of this research.

At the institutional level, resilience is somewhat harder to distinguish. From their study of railways systems in Holland, Hale and Heijer (2006) identified that some organisations without accidents were not resilient, but others with many accidents were highly resilient. They felt that the size of the risk and the “riskiness” of the environment were important considerations and that it is not the absence of accidents, but the fact there were not many more accidents that may be a mark of resilience (ibid). For Hollnagel *et al.* (2006) and Rodima-Taylor *et al.* (2012), resilience cannot be engineered into organisations by simply introducing procedures. Rather, organisations are made resilient through continuous monitoring of hazards and exercising of risk response strategies. Monitoring and exercising aid resilience building by facilitating the regular update of knowledge, competence and resources (ibid). To Dore and Etkin (2003), a system that encourages continuous monitoring of hazards and exercising of disaster management plans results in organisations that:

- effectively reflect on past events
- providing adequate resources to be able understand hazards
- result in a leadership agreeable to sharing risk
- create a society willing an invest in institutions that can coordinate resources
- are able to mediate moral problems associated with hazards

In other words, this thesis will need to gather evidence of system used to enhance resilience by getting organisations and communities to working together in

developing well integrated services as well as good policies for building resilience. To Dore and Etkin (2003), such a system is one that moves away from viewing the creation of a process an indicator of success to one which reflects the extent to which the process has improved resilience of the community.

### **2.2.5 Issues about resilience to take forward**

In summarising the above narrative, it is clear that research investigating the concept of resilience has become bifurcated between process and outcome approaches. The consequence has been that the resilience concept has lost some focus, but this research would propose that bridging the conceptual divide offers the best opportunity for successfully achieving the aim of this thesis.

Building on the premise that resilience is a fundamental trait possessed by all surviving human communities, this thesis supports the idea that community resilience is enhanced by using specific processes that result in distinct outcomes. Both processes and outcomes can be identified and analysed to enable a judgement to be made about the potential resilience of a community. Once made, the judgement of a community's resilience can be mapped onto a scale to indicate low (child level), moderate (adolescent level) or high (adult level) community resilience. Although the scale appears to suggest that resilience can be mapped in a simple linear fashion, the author is mindful that resilience is not so easily evaluated. Resilience is highly dynamic and even the process of researching resilience is likely to alter the state of resilience in individuals and ultimately communities. Hence the scale may be seen as a framework for assessment around which policy objectives can be proposed.

This thesis also recognises that community resilience is supported by a layer of individuals, each with their own resilient potential. Individual level resilience is not the focus for this research, but a measure of the general ratios of individuals with low, moderate or high resilience will be made so as to enable some correlation between individual resilience and community resilience to be made.

This thesis is particularly interested in resilience derived from the interaction between organisations responsible for the management of flood risk and communities at risk from flooding. As such, the resilience of the flood risk management system and its organisational structure (essentially the community of flood risk management organisations) will be assessed. This assessment will focus on the extent to which the flood risk management system has moved beyond tradition approaches to hazard management and embraced multiple viewpoints and public/private participation.

## **2.3 Understanding the community concept**

*“...the community which has neither poverty nor riches will always have the noblest principles; in it there is no insolence or injustice, nor, again, are there any contentions or envyings.” (Plato, circa 360BC)*

### **2.3.1 Section outline**

As stated in Section 2.1, resilience is the main concept underpinning this thesis, but it is the manifestation of resilience at community level where this research aims to build understanding. For this research therefore, it will be important to have a thorough grasp of the concept of “community”. Community is a deceptively simple concept that has been the focus of a consistent thread of discourse stretching far back into the annals of the written word (as the quote above illustrates). For practical

purposes, this review limits itself to evolutions of the community concept derived from a discourse that spans the last century.

The analysis of the community concept is split into four parts. The first part sets out the early twentieth century developments in the community concept (Tonnie's 1935). Second, the analysis turns to mid-twentieth century developments that challenged the traditional concept of community (Anderson 1983, Bell and Newby 1971, Berger and Luckmann 1966, Frankenberg 1969, Giddens 1984). Third, the analysis reveals a split that emerged in the latter part of the twentieth century between academic and organisational definitions of community (Boughton 1998, Dovers 1998, Fordham 1999, Marsh and Buckle 2001, Twigg 2000 and Young 1998). Finally, the analysis reviews critical refinements to the community concept emerging in the first decade of the twenty-first century (Amit 2002, Bauman 2001, Day 2006, Delanty 2003, and Hill 2000).

### **2.3.2 The “modern traditional” community concept**

In terms of locating the starting point for a study of what this author describes as the “modern” traditional community concept, the early twentieth century has been identified as a good place to begin (Amit 2002, Day 2006, Etzioni 1995, Frankenberg 1969, Marsh and Buckle 2001). From this period, the publication of a relatively short text, “Gemeinschaft und Gesellschaft” by Ferdinand Tönnies (1855-1936), is cited by many authors as a landmark in the study of communities (Bauman 2001, Bell and Newby 1971, Crow and Allan 1994, Day 2006, Delanty 2003). Tönnies (1935) sought to provide a philosophically grounded understanding of community (*gemeinschaft*) and its interplay with the broader notion of associations (*gesellschaft*). His conceptualisation of community was one which he characterised as centred on a

natural will, the self, possession, land and family law. Associations, on the other hand, were centred on rational will, the person, wealth, money and the law of contract (see Section 2.3 on social institutions for a more detailed elaboration of *gesellschaft*).

For Tonnies (1935), a “traditional” community was one where there is perfect unity of human wills. He identified three embryonic forms of a traditional community, including; the relationship between a mother and child, between a husband and wife and between brothers and sisters. This structure was also described in a correlated tier of categories including kinship, neighbourhood and friendship. Those categories fell under the broader headings of communities of blood, locality and mind (*ibid*). Life in a community was described as having a focus on mutual possession, mutual enjoyment, common goals, common evils, common friends and common enemies. For this research, the definition provided by Tonnies is useful for identifying case study communities. Suitable communities may be defined as including individuals and organisations in a locality that share a common enemy (in this research the common enemy is tidal flooding).

The nineteenth century also witnessed the development of a disciplinary divide in community research. The divide in community research arose when communities became the focus of study for various branches of the social sciences; broadly divided into sociology, social anthropology and geography. For sociology, early community research focussed on developing an understanding of complex social systems by explaining social structures and social relationships (Berger and Luckmann 1966, Barnard *et al.* 2004, Crossley 2002, Della Porta and Diani 1999, Giddens 1984 Parker *et al.* 2003, Seale 1995 and Tarrow 1994). Social anthropology,

in contrast to sociology, was concerned with the study of “simple” communities, often characterised as primitive or pre-modern (Bilton *et al.* 2002, Lopez and Scott 2000, May and Williams 1998). Early community research in geography focused on the exploration and description of the physical and human environments of the world (Berg 2003, Brenner 2001, Cloke *et al.*, 1991, Daniels *et al.* 2001, Knox and Pinch 2000). The challenge for this research is to effectively blend these three useful strands of research into a research methodology. The structure of the case study communities (simple or complex) and their environment (social and physical) will need to be revealed before an understanding of ways to enhance the resilience of the community can be achieved.

### **2.3.3 Challenges to the traditional concept of community**

For early twentieth century community analysts, Tonnies (1935) provided a useful set of quantitative parameters with which they could measure the scale, structure and complexity of communities. However, after the mid-twentieth century challenges to the Tonniesian concept of community became significant (Anderson 1983, Bell and Newby 1971, Booth-Fowler 1995, Crow and Allen 1994, Etzioni 1995, Frankenberg 1969).

During the 1960s, Frankenberg (1969) analysed a number of community studies conducted in England, Ireland and Wales. He identified “peculiarities” about communities, which challenged established thinking about complexity in communities. In particular, the studies challenged the view that complexity was directly proportional to the size of a community. Frankenberg found that, in contrast to the traditional view, a significant level of social complexity could be manifest in communities comprising just a few individuals. For this research, the implication is

that the investigation into the case study communities will need to delve more deeply (to the individual level) in order to gain a clear picture of the social structure in the study community. In addition, as this research will only be engaging a sample of the case study population, the author must be mindful that data gathered will never be able to reveal the “true” complexity of social relations in the case study communities. The implications are that further research within the case study communities may reveal additional complexity, which could lead to different interpretations of data gathered (see Chapter 8 for an assessment of this implication).

Bell and Newby (1971) provided another challenge to established thinking, specifically in relation to the view that communities were flat structures with benefits conferred equally to all members. Their work explored numerous case studies from across North America and Europe and their articulation of the community concept included the idea of stratification within communities. Stratification raised the issue of the potential for mobility of community members between strata as well as the idea of community leadership and power structures within communities. The idea of stratification was taken further by Anderson (1983), whose ideas were inspired by his study of communities involved with the Indochina conflicts of 1978-79. Anderson likened modern communities to traditional nation states, which possessed at their core a high “political” stratum. Traditional nation states were also characterised by the possession of diffuse boundaries. Modern nations were described by Anderson as flat, equally evident over their entire domain and possessing distinct boundaries which bordered other nation states. Being able to distinguish between a traditional hierarchical community with a diffuse boundary and a modern flat community with a distinct boundary will be important for this research. Those distinctions will help to reveal how significantly the flood risk community is separated from its larger

surrounding community and identify if the benefits of collective action are enjoyed equally by all.

The diffuse nature of boundaries to traditional communities led Anderson (1983) to propose that communities be “imagined” as indefinitely stretchable networks. Such a definition made scalar representations of the community difficult and reflected a change in modern society resulting from the growth in human geographical mobility. To Crow and Allen (1994), researchers need to take account of mobility if they wish to develop an understanding of the problems researchers face when adopting the traditional view of communities as geographical referenced objects. They encouraged the notion of referring to communities as “interlocking social networks” (Crow and Allan 1994 p178). Etzioni (1995) reinforced this view, describing communities as “social webs” and Booth-Fowler (1995) categorised these interlocking webs as falling into three basic types: communities of ideas, communities of crisis and communities of memory. The community “of ideas” was split between participatory and republican, which may broadly be considered to equate to the Tonniesian *gemeinschaft* and *gesellschaft*. Communities “of crisis” were described as “thin” and fashioned by the times rather than any intellectual ideas and often tyrannical in nature, less open and dealing harshly with those who dissent. Communities “of memory” may be considered as reflecting an anthropological understanding, derived from long established belief systems, traditions and religion (Booth-Fowler, 1995, Wilson 2012). That understanding of community points to the challenge faced by this research, namely to identify and understand the role played by multiple overlapping and often less well defined sub-communities within the main flood risk communities. It is conceivable that the flood risk community would fit with Booth-Fowler’s definition of a crisis community. But crisis communities will overlap

with communities of ideas and memory, so this research will seek evidence of how these overlapping “imagined” communities enhance or hinder the development of community resilience.

### **2.3.4 The academic and institutional community concept divide**

At the turn of the millennium, the Australian Journal of Emergency Management included a running thread of discourse with a focus on “community”, which spanned the years 1998-2001. Many authors (Boughton 1998, Buckle 1999 and 2002, Dovers 1998, Fordham 1999, Marsh and Buckle 2001, Twigg 2000 and Young 1998) provided insights into the wide range of traits used to define communities. The traits identified by these authors included experience or function, a common interest, profession, language, age, gender, ethnicity, disability, status or even the level of hazard exposure. Significantly, the papers also revealed a growing divide between academic conceptions and institutional conceptions of community.

Marsh and Buckle (2001) studied communities in the UK and Australia. They found that institutions often held strongly to the traditional concept of a community, as tied to a locality such as a household, neighbourhood, town or state. Their views echoed those of Frankenberg (1969), suggesting that institutions serving the community were under pressure to simplify community definitions in an effort to better target limited resources. Institutions often defined communities simply as those receiving services they provided and overlooked the inner complexity of the community itself. Gottdeiner and Budd (2005) reinforced this view, finding that many social institutions had an idealised and nostalgic view of what constituted a community. For Gottdeiner and Budd, such views had led to erroneous policies and wasted resource allocation. To Bauman (2001), the “nostalgic” view of communities held by institutions could be

described as a view of “paradise lost or a paradise still hoped to be found” (p3). This research will be interested to learn if institutions involved in the management of flood risk, especially in the Teign Estuary area, still hold to a simplified view of the community concept. The discovery of whether or not institutions have refined their understanding of communities will help to guide any policy recommendations designed to improve community resilience by building on relations between communities and institutions.

To Marsh and Buckle (2001), academic research has also revealed that communities are not passive and never-changing entities. Communities may not be self-aware or very cohesive and individuals will belong to a number of communities, but are not always aware of the communities to which belong (ibid). The idea that the case study communities and individuals in the communities may not be self-aware, or very cohesive, is potentially important. That idea will have particular impact when evaluating the merits of using social capital to build community resilience.

### **2.3.5 Recent critical refinements to the community concept**

Critical reflections on the community concept began to take hold towards the end of the twentieth century. Crow and Allen (1994) are typical of researchers at that time, bringing to the fore issues of inclusion, exclusion and social isolation within communities and highlighting the emergent focus on gender issues, community engineering and community control by government agencies.

Etzioni (1995) was critical of some attributes of communities. Specifically he explored how individuals need to sacrifice personal freedoms when adopting membership of a community. Within a community, constraints could be imposed by elites, by external influences or generated by the members themselves. As such,

communities and the individuals within the community were seen as mutually supportive, but at the same time tensed (ibid). For Etzioni, a community functioned best when the individual was not consumed by the community, but when the community and the individual were in balance. He considered that much in the historical literature suggested an on-going research quest to find the appropriate balance between individual freedom and community constraints. This idea of community members being in tension with the community itself could be pertinent in this research. It is possible to envisage that nobody wants to be a member of a community at risk from flooding, but the dilemma for members is “do I work against the community or work with the community?” This research will seek to assess the extent to which individuals are willing to sacrifice some personal freedom in order to address the local flood risk.

Bauman (2001) explored in more depth the paradox inherent between an individual's desires for security provided by community membership against the desire for personal freedom. He suggested that the obligation to share resources within a community led the resource rich to “opt out” of community membership. In his opinion, opting out had led to the creation of isolated environments or ghettos where “globetrotting elites” lived separate lives from the “weaker masses”. In that way, Bauman defined the community concept as a “philosophy of the weak”, espoused by those with most to gain from the sharing of resources. This idea is interesting, because if evidence could be found that the wealthy and powerful elite were abandoning the case study communities then this could have implications for the success of any measures aimed at mobilising the community to address the local flood risk. The implication is that the community would be fragmented and not able to unite to collectively address the hazard.

Within the critical literature the utility of the community concept itself starts to come into question. Amit (2002) was not alone in considering that the contemporary notion of community, as an idea or “quality of sociality” manifest in the form of a collective identity, had been undermined by the move away from the traditional community concept. Some authors, such as Hill (2000), had already recognised that the use of the term community to describe collectives with a common interest, but with no physical boundaries, conferred a false sense of cohesiveness to the collective. This research must be mindful of not conferring the term community where it would be inappropriate to do so. The aim is not to confer a sense of cohesiveness if none exists. Rather, data gathered will be used to determine the extent to which the communities see themselves as distinct sub-groups within the larger communities in which they are situated.

Delanty (2003) summarised many of the ideas developed by critical researchers. To Delanty, “modern” communities are constructed in virtual space rather than in institutional spaces. As such, communities were not a form of social integration, but of belonging by participation in a communication process. As with Bauman (2001) and Amit (2002), Delanty (2003) characterised modern communities as embracing individualism with members choosing to situate themselves within symbolic or imagined communities. The result of these developments was that modern communities have highly unstable and fluid structures, which are as easily destroyed as created. He also suggested that the instability has led to a tendency to destroy traditional forms of community, which are then re-created in new forms. Literature reviewed in Section 2.1 pointed to how disaster management legislation has put “community resilience” at the heart of disaster planning (HMG 2004). Many organisations have been drawn into the “conversation” about flood hazard

management. However, what is not clear is if this move puts communities in tension with the state and this research will seek to understand if such a tension exists. In addition, the ideas that modern communities can be easily created and destroyed and that individuals can easily situate themselves within a temporary “imagined” community may prove important when developing proposals about how to improve community resilience.

For Day (2006), the long history of community studies has resulted in the view that “[community]...has been worked to death...and its meaning is so wide and diverse, its connotations so inconsistent and at times downright dangerous, that it deserves no place in any serious social analysis” (p1). In addition, he described how social identities are now constructed out of the intersection of memberships and commitments to several communities and that within each community the individual is free to choose a different identity. Despite the research challenges and conflicting rhetoric surrounding the concept of community, Day (2006) conceded that the concept remains popular with social scientists, policy makers, politicians and the public. As this research is seeking to promote the idea of the community in building resilience, the idea that the concept is popular with policy makers and the public will be important to measure. In addition, this research will be mindful of the idea that individuals may adopt different identities in different communities. The latter point may be useful when promoting measures to improve resilience within a community, i.e. by proposing the creation an identity associated with the management of the local flood risk.

### **2.3.6 Issues about community research to take forward**

The analysis of the community literature has raised a number of issues of importance for this research. The first of these is that this research must be mindful not to confer the classification “community” where it would not be appropriate to do so. In this regard, evidence will be sought to justify such a distinction using physical, documentary and cognitive assessments. Historical evidence will be sought of flood events in the case study communities and opportunities provided for those involved in the research to self-articulate the existence of the community as a separate entity, distinct from the surrounding environment.

The literature has also made the author mindful that flood risk communities may be ones that stem out of a crisis. As such, flood risk communities may be temporary, cognitively thin, loosely connected, largely lacking self-awareness and potentially in conflict with themselves. Where evidence of a functioning flood risk community is found, the ability of individuals to opt-in and opt-out will be assessed and any distinct identities adopted by individuals in relation to the management of the local flood will be identified. Associated with the potentially temporary nature of a flood risk community, this research will assess the ease with which flood risk communities are created and destroyed. That assessment will provide evidence about the durability of events to enhance or deplete the resilience of the community.

It is now evident that this research will need to survey individual members of the community to be able to judge how diffuse the boundary of the community is and to develop a picture of the sub-clusters that will overlap the case study community.

That research will help to identify the traits upon which the flood risk community and its sub-clusters are based, which in turn will help in the assessment of traits that are

most important when it comes to assisting individuals in the community at times of crisis.

The strength of responses received when identifying sub-clusters may be used to judge the hierarchy of community sub-clusters. That hierarchy can then be used to help identify elites within the communities and thus enable some assessment of the power and influence of elites within the community. The research will need to identify any tensions within the community between the individual members and hierarchies, but also between the community and external institutions. Any tensions found will need to be assessed to determine if it is due to the fragmentation of the community, to undue influence being exerted by sections of the community or from pressures exerted by external institutions.

Finally, an assessment will be made as to whether the community concept is popular or not, if it is being promoted by those with something to gain or if it is being promoted for the overall good of the community.

## **2.4 Social institutions**

### **2.4.1 Section outline**

What is clear from the title and aim of this thesis is that social institutions feature heavily in its deliberations. Of particular interest for this research is the relationship between institutions and communities, specifically how those relationships can be harnessed to improve community resilience. Therefore, it is important that this research develops a good understanding of social institutions.

In this section, literature helpful for building an understanding of social institutions and to identify issues of importance for this thesis will be analysed. The analysis starts with a brief summary of the origins of “institution” research and explores the process of institutionalisation. The institutionalisation process is defined as being that which converts a community into an institution (Berger and Luckmann 1966, Hay 2004, Mayhew 1982, Silva 2007, Tonnies 1936). Determining when an institution may be classed as a “real object” is judged by the author to be important for this study, so the systems for understanding this distinction are next to be analysed (Brinton and Nee 1998, Nee and Ingram 1998, Giddens 1984, Hodgson 1988, Knight and Ensiminger 1998, Nee 1998, Scott 2000, Searle 1995). The analysis ends with a section exploring how the work of researchers in the field of organisational analysis can help this project (Hage and Hollingsworth 2000, Hassard 1993, Scott 2001, Scott and Meyer 1994, Wicks 2001).

#### **2.4.2 Institutional research and the institutionalization process**

As described in Section 2.2, Tonnies (1935) felt compelled to distinguish between *gemeinschaft* (community) and *gesellschaft* (association or social institution). He made that distinction even though he considered both to be similar constructs of human aggregations. Distinctly, he defined *gemeinschaft* as an aggregation of individuals united in spite of separating factors and *gesellschaft* as an aggregation of those essentially separate in spite of unifying factors. This subtle, but important, distinction enabled Tonnies to describe social institutions as networks of individuals where the spheres of activity and power are sharply separated, where nobody granted or produced anything for another individual unless in exchange for a consideration, thereby distinct from a community (*ibid*). To Tonnies (1935), the

network of individuals with “contractual” bonds provides the basis for understanding the creation and maintenance of social institutions. That distinction is also useful for this research, enabling the separation of communities from institutions and the identification of institutions within communities.

Talcott Parsons (1902-1979) was a prolific contributor to social institution theory and his ideas evolved in his writings over several decades, but what is presented here is drawn mainly from a synopsis of his theory written posthumously by Mayhew (1982). To Parsons, institutions evolved through the integration of social systems that existed within communities, a process which he described as institutionalization (ibid). From Parsons’ perspective, the institutionalization of a community was manifest by the articulation of roles that actors within the community may adopt. Each role is accompanied by a set of rules that dictate goals and procedures that must be followed by the incumbent when enacting the role (Mayhew 1982). Two important outcomes resulting from the institutionalization process are the allocation of resources to roles and the provision of facilities for the performance of such roles. These outcomes are explored further below, but also have important ramifications in the development of social capital, which is another area of interest for this research (see Section 2.4 for analysis of social capital literature).

Berger and Luckmann (1966) expressed some misgivings about the rigid, rationalist definition of an institution, as expounded by Parsons. To Berger and Luckmann institutions should be viewed as being more “plastic” than Parsons was ready to admit. To Berger and Luckmann, institutionalization was not a purely rational process defined by the habitualisation of human activity. Rather it was driven by the sometimes irrational desire of individuals to be freed from having to make too many

decisions and to provide psychological relief from the decision-making process. These drivers were the precursors to institutionalisation and roles which emerge from the institutionalisation process may be regarded as institutions in their own right (ibid). This research will be seeking evidence of habitualized frames of activity in relation to flood risk management. That evidence will help in the identification of institutions and roles that play an important part in the management of flood risk, both in and around the case study communities.

More recently, Hay (2004) noted a growing chorus of commentators pointing towards the lack of civil engagement in UK society and the decline in respect for what he termed “the duties of citizenship”. Hay (2004) correlated the degree of institutionalization in a society to the level of disaffection within the citizenry and proposed that institutionalization was contributing to that disaffection. For policy makers, institutionalisation involves the internalisation of economic assumptions, which are non-negotiable and external to the policy-making process. That internalisation makes political actors largely powerless (ibid). For Hay, the powerlessness of political actors is the result of institutionalisation, which has displaced decision-making to quasi-independent and supra-democratic authorities. Hay’s ideas are interesting for this research in two ways. First, it points to the need to learn if there is any correlation between the level of institutionalisation within the case study communities and its disaffection with the way the local flood risk is managed. Second, it points to the need to assess the extent to which institutionalisation in the system for managing flood risk has displaced decision-making to quasi-independent authorities.

Silva (2007) provided a geographically referenced analysis that linked institutionalization to land administration. His study of the institutionalization of a land management system in Guatemala illustrated a number of social and institutional challenges to the institutionalization process. Silva (2007) contended that the institutionalization process required individual actors and institutions to develop solutions to established problems. Commitment to these solutions was achieved through bargaining and concession-making but would only be implemented if actors were incentivised to share information. The process could be rendered ineffective if established actors considered that their power-base was being undermined or if they perceived that the solutions would make their positions “dispensable”. For this research, Silva’s work highlights the importance of understanding the link between institutionalisation undertaken to address a local flood risk and the prominence of a local flood risk problem. Specifically, the suggestion is that the problem must be recognised by the community before an institutionalisation process can be enacted to address the problem. In addition, it is important to understand the link between institutionalisation and the bargaining process used to develop solutions to local flood risk problems. The issue here is that institutionalisation to address the local flood hazard may fail if the power-base of local actors is undermined.

#### **2.4.3 Institutionalisation and the manifestation of institutions as objects**

Tonnies (1935), Berger and Luckmann (1969) and Searle (1995) all tackled the issue of how institutions emerge as “social objects” from the institutionalisation process. According to Searle (1995), social institutions are human constructs, which may show no evidence of existence within the physical world. However, that does not deny them the right to be distinguished as objects in the real world (ibid). Both

Berger and Luckmann (1969) and Lopez and Scott (2000) stressed that not all institutions qualify as social objects, only institutions which have fully undergone a process of institutionalization qualify as “real” objects. For this research, the ability to distinguish between fully objectified institutions and institutions which have only been partially institutionalised may be useful. It is conceivable that within the case study communities most sub-groups will not be fully institutionalised, but the institutions responsible for managing flood risk will for the most part be fully institutionalised. What is not clear from established literature is if partially objectified institutions are less effective in dealing with local flood risk issues than fully objectified institutions.

Beyond the ability to ascribe the distinction of “real object” onto a social institution, Berger and Luckmann (1969) pointed out that historical analysis of social institutions will often reveal that this reality is variable over time. They showed that institutions are not fixed and their degree of institutionalization will vary over time. This variability often manifests when institutions, undergo segmentation or segregation. They characterised this segmentation as a process of deinstitutionalization, creating sub-universes which often become autonomous to the original institution (ibid). The important lesson for this research is to gather historical data about the flood risk institutions, to discover if the level institutionalisation is growing or falling and if institutions are consolidating, expanding or fragmenting. That historical data will impact on any proposals promoting further engagement by case study communities with flood risk institutions.

Hodgson (1988) was interested in how institutions, once objectified, develop the power to exert influence over the development of broader societal ideas and actions. Hodgson’s findings supported earlier work by Giddens (1984), who had expounded

ideas about power relationship between institutionalised social structures and individual agents. Both authors considered that the institutionalization process could sometimes result in a moral numbness emanating from a centralised bureaucracy. By way of illustration, Hodgson (1988) described global financial systems as networks where a diverse framework of institutions operated and where the imposition of role and institutional constraints is seen as important by wider society to maintain some form of stability. However, within global financial systems constant pressure is exerted by individual actors to minimise constraints wherever possible (ibid). What will be of interest to this research is any evidence of moral numbness resulting from the institutionalisation process in relation to flood risk. The suggestion is that this research may find that pressure from wider society for greater institutionalisation to deal with flood risk. That pressure may be resisted by established actors, angered by the imposition of additional constraints on their actions and/or resources. Such evidence will impact on proposals to further enhance the strength of institutions, as this action could exacerbate the numbing effect.

Picking up on another point made by Hodgson (1988), who came to the realization that new social objects did not always happen without resistance and coercion, Knight and Ensimerer (1998) found that the key to the establishment of a new institution was the ability of those seeking the change to enforce compliance. To that end, bargaining was seen as the primary mechanism whereby those seeking to enforce compliance achieve change and conflict was often associated with such a process (ibid). To Knight and Ensimerer (1998), actors with superior bargaining power were better able to produce new social institutions and the issue is important for this research, as proposals it develops will need to be sensitive to the level of resistance to be expected and the level of coercion needed to enact policy

recommendations. It will also help this research to have evidence of the institutions within the community with superior bargaining power; as such evidence will be needed when developing proposals for policy maker on the most effective ways to engage with the community to enhance community resilience.

Despite the sometimes adversarial nature of institution objectification, Brinton and Nee (1998) considered that the achievement of objective reality status by a social institution was evidence of its pivotal in society. In a further analysis, Nee and Ingram (1998) considered that by structuring social interactions, institutions improve group performance and, although the mechanisms were not well theorised, one indicator of higher performing groups was a high level of face-to-face social interactions. Nee (1998) was more specific and, importantly for this research, explained that the constraints institutions impose on direct interactions within communities rendered them a form of constraint on the level social capital conferred by the institution onto the community (see section 2.3 for a deeper elaboration of the social capital concept).

#### **2.4.4 Additional insights from organisational researchers**

Hassard (1993) provided a useful insight into the operation of institutions, derived from his studies of organisational behaviour. He developed a classification system that distinguished between institutions with closed, partially open or open structures. Closed organisational systems were introverted, self-sufficient entities with a focus on internal processes and the measurement of performance variables that were unaffected by external factors. Partially open organisational systems recognised a limited range of external performance effecting variables as having an influence over the actions of the organisation, but their use was limited to plugging holes in

understanding their internal operating environment. Open organisational systems demonstrated a dynamic relationship between internal and external environments, continually adapting internal process to external inputs in order to achieve a balanced equilibrium (ibid). This research is seeking to develop proposals to enhance community resilience using links between flood risk management organisations and communities at risk from flooding, hence the openness of communities and institutions will be a useful feature to assess.

Scott and Meyer (1994) defined organisations as bounded, relatively autonomous and rational structures, which had spread within and between sectors of society. To Scott and Meyer (1994), the world was filled with organisation and modern society could be viewed as a “society of organisations”. They also considered that organisation occurs at several scalar levels spanning individual, community and inter-institutional levels. They espoused a vision of the world as infused with a long-term process of rationalization that continually expanded the possibility and necessity for changing the established organisation. That view is helpful for this research by illustrating how the entire system for managing flood risk may be viewed as a single organised entity. Organisation to deal with flood risk is distinct from institutionalisation, but is equally important. Evidence of a bounded, autonomous and rational organisation to deal with flood risk at the individual, community and inter-institutional level may be easier to find than evidence of institutionalisation. Gaps in the organisational structure may point to areas where effort to improve community resilience could be focussed.

Hage and Hollingsworth (2000) were interested in the capacity for societies and institutions to change and likened it to the way commercial organisations learn

through innovative products and process development. They considered that the greater the diversity of competencies and knowledge within a well-connected network, the greater the likelihood that innovation would occur. They also suggested that if radical solutions to problems were to occur in one functional arena, then there must be strong connections to other functional arenas, which possessed radical new ways of thinking. Hage and Hollingsworth (2000) have highlighted another important lesson for this research, namely that the degree of connectedness within and between the flood risk institutional network and the flood risk communities will have a bearing on the capacity of the system to innovate solutions to the local flood risk problem. The suggestion therefore, is that if the flood risk communities wish to change in order to address the local flood risk, those with well-connected networks will be most able to effect that change.

For Scott (2001), current institutional thinking could be summarized under what he described as the three pillars of organisational legitimacy, namely the normative pillar, the cognitive pillar and the regulatory pillar. The normative pillar embodies the process whereby social norms and values are objectified into roles, rules and procedures. The cognitive pillar assigns meaning to the objectified rules and procedures, providing the rationale for why rules must be obeyed and justifies the sanctions imposed on those who break the rules. The regulative pillar is a coercive process that enforces compliance with institutionalised rules and applies sanctions when rules are broken. Wicks (2001) applied Scott's three pillar framework in his analysis of a mining disaster in Canada, with a view to developing a better understanding of how institutionalization could lead to harmful mindsets. Normative pressures had induced local organisations to adopt rules and values from wider society, which served to provide them with greater legitimacy, but which also

undermined important internal rules and procedures. Regulatory pressure resulted in organisations becoming more resistant to scrutiny and change and predisposed actors to accept inappropriate risks, buffering them from fear of risk taking and causing them to develop an inaccurate perception of potential danger. The combination of normative and regulative pressures resulted in a cognitive process that justified harmful mindsets within the mining organisation (ibid). Collectively, the three processes provide the necessary antecedents for disasters to occur, so for this research the effects of normative, coercive and regulatory pressures within the flood risk management system and the flood risk communities will be important to assess. That assessment will be especially necessary, if harmful mindsets are to be prevented from evolving out of any recommendations arising from this research.

#### **2.4.5 Conclusions**

What this section has revealed is a literature rich with advice for this research. Starting with the process of institutionalisation, this research has learned that the process by which communities organise themselves and gradually manifest as social objects involves the articulation of roles. Once created, roles enable the community to focus efforts on developing procedures and allocating resources that enable the role incumbents to enact their roles. This research will seek evidence of such behaviour in the case study communities in relation to dealing with the local flood risk.

The institutionalisation process is partly driven by internal pressures and partly by pressure arising from outside the community. Within the community, there may be pressure to reduce the psychological stress of having to take decisions about actions to deal with flood risk issues, in this case institutionalisation of the process provide

welcome relief. Externally, policy makers are under pressure to improve civic engagement in the flood risk management process and that will require communities to organise in order to facilitate that engagement.

This research must be mindful that the institutionalisation process is not without negative consequences, so evidence will be sought of any disaffection within the policy making community. Such disaffection will be assessed to determine if it results from a concern by policy-makers that their power-base is being undermined by changes to the governance system. In addition, this research will assess if the institutionalisation process of the policy system has shifted decision-making to quasi-independent bodies.

Any evidence of institutionalisation to deal with flood risk may be fully or partially enacted and historical evidence will be collected to reveal if the level of institutionalisation is increasing or decreasing. That evidence will be correlated with data about the success or otherwise of community efforts to address the local flood risk. The correlation will enable a judgement to be made about the merits of institutionalisation, as opposed to organisation, when dealing with the local flood risk.

Both evidence of institutionalisation and organisation to deal with the local flood risk will help to identify evidence of groups with superior bargaining power. Evidence of organised groups with superior bargaining power could be harnessed by this research in any proposals that aim to help coerce the community to develop and implement policy decisions that ultimately enhance the resilience of the community to the local flood risk.

The extent to which the organisation of the flood risk management system makes institutions and communities open or closed to external influences will also be of

interest to this research. Closed communities and intuitions may be highly resistant to any proposals designed to address weaknesses in their resilience, whereas open communities and institutions may be hard to assess as they may be continually changing or segregating in response to external environmental pressures.

The idea that communities and institutions are in a constant process of normalising, regulating and possibly segregating is useful for this research as it points to the potential to direct such processes in order to improve community resilience. But, the author is mindful that such efforts must not encourage the formation of a moral numbness and harmful mindsets, which are the antecedents of future disasters.

## **2.5 Social capital**

### **2.5.1 Section outline**

At this stage in the review of concepts that underpin this research, the background study has reached the final important concept, namely social capital. As with social institutions (Section 2.4), it will be clear to the reader from the title and aim for this thesis that social capital is an important constituent of the research for this project. Specifically, this thesis has the stated aim to explore social capital derived from community-institution links and from that exploration develop a deeper understanding of how social capital can be used to improve community resilience.

To assist in developing an understanding of social capital, this section starts by taking the reader through a brief summary of developments in the evolution of the social capital concept (Bourdieu 1977, Coleman 1990, Holt 2008, Koniordos 2005, Kovalainen 2005, Putnam 1993). The review then moves on to consider scalar issues related to the social capital concept, spanning individual and collective

perspectives (Dixon 2005, Haerpfer *et al.* 2005, Mohan and Mohan 2002, Rotberg 2001). With issues to do with scale considered, the focus then turns to a core issue for this research, namely how social capital may be engendered and mobilised (Catts 2007, Engberg and Stubbs 1999, Lin 2001 Radcliffe 2004). Finally, and in recognition of the temporal requirements for a resilience based analysis (Section 2.2), consideration is given to methods used for discerning historical levels of social capital in a community (Grew 2001, McIntosh 2001, and Rosenband 2001).

### **2.5.2 Developing the concept of social capital**

According to Koniordos (2005), the current manifestation of social capital was first introduced by L .H. Hamilton in the 1920s and was further developed by G. Loury in the 1960s. However, most authors agree that Pierre Bourdieu (1930-2002), James Coleman (1926-1995) and Robert Putnam (1941- ) are collectively responsible for popularising the concept during the 1980s-90s (Catts 2007, Holt 2008, Kaasa and Parts 2007, Lin 2001, Mohan and Mohan 2002 and Osborne *et al.* 2007).

Pierre Bourdieu first described social capital as “symbolic capital”, which he defined as a disguised form of economic capital, and which comprised “the prestige and renown attached to a family name” (Bourdieu 1977, p179). The term “capital” in that case was used to describe the ability to translate the “prestige and renown” into a tradable commodity. For Coleman (1990), social capital was derived from the relations between individuals, which required investment in an ideological structure complete with social rules and sanctions to be applied if the rules were broken. Coleman stated that social capital was created when one individual does a favour for another, thus forming an obligation on the recipient to repay a debt at some time in the future. The timing of the repayment was often a point of contention between the

parties, but generally, Coleman suggested that if the debt was left too long the value of the social capital depreciated (ibid).

For Putnam (1993), reciprocity was the most important element in the process of creating social capital, which he described as derived from “features of social organisation, such as trust, norms and networks” (p167). More recently Putnam’s views have been challenged and have been described as too focussed on the outcomes of social interaction. Koniordos (2005) is one such challenger, describing Putnam’s concept of social capital as diverting attention away from sociability towards reciprocity. The issue for Koniordos is that reciprocity is not absolutely necessary for the creation of social capital. Kilpatrick and Abbot-Chapman (2007) reinforced this view, suggesting that community level social capital “represents the processes of social interaction.....rather than the outcome” (p52). For Catts (2007), this new thinking has revealed that social capital at the individual, community and national levels involves different constructs and may be manifest in different ways. To Haerpfer *et al.* (2005), the new thinking also suggested that a distinction needs to be made between social capital that was accessible to all and social capital that was unique to a particular individual.

From the early days of popularising the social capital concept its relation to other forms of capital were questioned. Coleman (1990) elaborated on the distinction between social capital, human and physical capitals. To Coleman, human capital is distinct from social capital by being embodied in the skills and knowledge acquired by individuals. Physical capital was described as embodied in the tools, machines and productive equipment possessed by individuals (ibid). In his later work, Bourdieu (1993) was also explicit in distinguishing between social, economic and cultural

capitals. To Bourdieu, economic capital is embodied in the monetary assets and resources possessed by an individual and cultural capital is embodied through an individual's status in society (ibid). The distinctions made by Coleman and Bourdieu between social and other forms of capital are still broadly accepted today, but new research has led some authors to question the clarity of the distinction made between the different forms of capital. To Engberg and Stubbs (1999), ideas about family and kinship, norms and values, culture and politics have become conflated, blurring their relationship to social capital. Added to that, Kovalainen (2005) found that whilst most disciplines still accept that social capital is embodied in social relations, some question if it exists in parallel to the other forms of capital or at some other level.

Another issue of importance to this research was made clear from the early days of social capital research, namely that "those who have social capital tend to accumulate more" (Putnam 1993, p169). According to Radcliffe (2004), this issue helps to emphasise that the social capital concept is derived from a western philosophical and political tradition. Many organisations with different cultural heritages remained hostile, or indifferent, to the social capital concept. For Koniordos (2005), social capital theory had broadened over time to overlap with the theories of political science, economics, social development and many branches of geography. The broadening of social capital theory has made the development of a unified definition of the concept difficult (ibid). Despite these problems, Kovalainen (2005) found that social capital's utility for describing and explaining social action has made it a concept of global importance. Holt (2008) reaffirmed the global importance of the social capital concept. He judged that social capital has high political currency, which

was indicated by it featuring ever more heavily in social policy research across the world (ibid).

This brief overview charting the historical developments of the social capital concept highlights a number of important issues for this research. Specifically, that social capital is not just a popular and powerful tool for social research, but also that it blends well with many of the other concepts already highlighted by this chapter (resilience, community and social institutions). Social capital places a value on the social relations between individuals in a community and between a community and external institutions. That value is what this research seeks to utilise when proposing ways to improve community resilience.

### **2.5.3 Scales of social capital**

Mohan and Mohan (2002) were two researchers who emphasised the distinction between the social capital created by relations between individuals and social capital created by relations between collectives. To them, both of these constructs may be viewed as relations between discrete social agents and thus suitable subjects for social capital research. By way of illustration, they found that social capital at the individual level could often be high within communities, but the measure of social capital between communities may be low when viewed at the community level (ibid). The importance of inter-community social capital was emphasised by Rotberg (2001), who regarded that social capital of that type was important in enabling societies to work at their best.

To Rotberg (2001), where community level social capital was high, citizens trusted their fellow citizens and government bodies worked towards the public good. In contrast, where community level social capital was low, economic and political

growth was correspondingly slow and societal goals were directed towards the private good (ibid). Haerpfer *et al.* (2005) further examined this link between individual and collective levels of social capital. They considered social capital at the national scale by examining post-communist countries in Europe, where social capital was increasingly perceived as a “crucial variable” to improve economic performance. They not only found that social capital stock was low in countries transitioning from centrally planned to market economies, but also, and perhaps more importantly, that it was proving much more difficult to create new stocks where existing stocks were low. They contrasted this against economies where existing social capital stocks were high, in those countries they found that the generation of new social capital stock was easier (ibid).

Dixon (2005) developed similar findings to Haerpfer *et al.* (2005), but he focussed more on social capital at the individual level. Importantly for this study, Dixon’s examination of communities in the Ethiopian wetlands found links between social capital and social resilience. Specifically, Dixon found that in areas where individuals possess high levels social capital the capacity of the community to adapt and/or to apply indigenous knowledge in response to environmental challenges was also high.

For this research, the review above makes a clear and important link between social capital and community resilience. It also makes clear that to fully understand the link this research will need to explore social capital at the individual and collective level. The issue being that social capital may be judged to be low at the collective level, but if high at the individual level then community resilience may be less affected. By contrast, if social capital is high at the collective level but low at the individual level

the impact on community resilience is less clear from the published literature and this thesis can go some way to plugging that gap in existing knowledge.

#### **2.5.4 Engendering and mobilising social capital**

At the collective level, Mohan and Mohan (2002) found that social capital could be depleted through misuse. Catts (2007) added that stocks of social capital at all levels are self-reinforcing, but require: cooperation, trust, reciprocity, civic engagement and an aspiration towards the goal of collective well-being. For Grew (2001), that collective structure and goal is achieved through the establishment of behavioural norms, or “institutionalised habits”, within the community. But Catts (2007) warned that those norms, or habits, were sometimes achieved through coercion. When coercion is used the benefits accrued from the investment in social capital were often not distributed equally throughout the whole community (ibid).

Radcliffe (2004) examined case studies from Mexico, Tanzania, Guatemala and the Dominican Republic. She found that social capital is often engendered to either maintain a class distinction or to glue a society together. In Mexico, she found that community power depended upon its ability to negotiate with regional and national elites (social capital derived from external links to the community) and was less dependent upon the strength of the local organisations (social capital derived from links within the community). From the Tanzanian study, she found that the greater the connectedness of community groups (Internal connections), the more economically prosperous it was. From the Guatemala study, she revealed that communities enriched with new social capital often engaged in social protest and from the Dominican Republic case, she revealed that development projects often create conflict which undermined local institutions and destroyed social capital (ibid).

The idea that social capital can be mobilised and used as a tool to achieve social change was explored in more detail by Engberg and Stubbs (1999). They evaluated a United Nations Development Programme (UNDP) resettlement project in Travnik, Bosnia Herzegovina. The UNDP project sought to apply the theories associated with social capital to promote peace and democracy in communities fragmented by conflict. The aim of the project was to engender social capital across all communities in order to weaken the dominance of powerful local elites. However, the results of their study were inconclusive and they judged that social capital alone was not effective. To them, programmes that aim to achieve social change need the support of political and economic initiatives (programmes to boost other capitals). Yet they held that the acquisition of social capital was still fundamental to the process of change (working in parallel with other capitals).

Lin (2001) was able to shed more light on the reason why social capital is fundamental for social change. Lin's research found that there were four main reasons why social agents choose to invest in social capital. First, social capital creates links that facilitate the flow of information between agents (enhancing human capital). Second, social links act as ties that exert influence on the actions of agents. Third, social ties certify the credentials of a social agent (enhancing cultural capital). Finally, all of the above actions serve to reinforce the individual's identity, the group's identity and their respective reputations (likened to clarifying institutional boundaries, roles and hierarchical structures). Lin echoed concerns mentioned earlier in this chapter, namely that exploitation of such an investment could occur if the benefits were not equitably distributed throughout the community, but she added that in this respect her research showed that the more hierarchical the social structure, the greater was the variation in the distribution of social capital (ibid).

Overall, these researchers present an image of social capital as a highly prized and frequently exchanged commodity. A commodity that is often engendered to maintain social inequalities and is often “spent” in efforts to tackle the same inequalities.

There are two other important points for this research to note. First is that proposals focussing on enhancing social capital only, in isolation from form enhancing other forms of capital, may lead to ineffectual outcomes. Second, is that any snapshot view of a community will reveal a non-uniform distribution of social capital within the community. As a consequence, this research will need to assess the relationship between social capital and other capitals when used to address flood risk. In addition, this research will need to gain some temporal perspective on levels of social capital in order to assess if levels are rising or falling.

### **2.5.5 Indelible markers and snapshots of social capital**

The ability to retrospectively analyse a community and determine some measure of its social capital by reading indelible markers left in its historical records is an important consideration for this research. Grew (2001), Rosenband (2001) and McIntosh (2001) all tested the ability of social capital to leave indelible markers that future researchers could use to assess historic levels of social capital.

Grew (2001) used Putnam’s definition of social capital in what he called a “loose” way, embracing what would be defined above as a combination of social and cultural capital. He considered that this broader definition made the social capital concept more useful and more easily attached to historical evidence. He studied communities in Italy at the time of the French revolution and sought out evidence of habits of cooperation and trust between them. With that approach, he was able to judge that communities in Italy at the time of the French revolution possessed high levels of

social capital. He was also able to determine that social capital was strengthened when state bodies loosened their grip on the communities (ibid).

Rosenband (2001) set into relief the significance of snapshot assessments of social capital in a study of medieval craft guilds in Europe. He found significant variance of what he termed the “incubation of social capital” over extended periods of time.

Using a narrow definition of social capital, as based on norms and networks of social connections, he was able to reveal that the incubation of social capital over time is by no means continuous. Discontinuities arise when communities engage in conflict with political hierarchies, themselves or when social capital was manipulated by community elites for private gain. He also found that social capital was provided with some stability when communities entrusted the state to spread the benefits to all of society, often achieved when the state enshrines the norms that encapsulate the social capital into legislation (ibid).

The importance of the state in the development of community level social capital was revealed by McIntosh’s study of medieval English market towns (McIntosh 2001). She found evidence that social capital was produced by several types of state sponsored human interaction in those communities. In English medieval society, public institutions were effective in (re)producing social networks, trust and respect. She contrasted her findings to modern studies of social capital, that often under-play the role of public institutions in the production of social capital. To McIntosh, such an approach runs the risk of missing an important element needed to ensure the effectiveness of proposals aimed at maximising the creation and mobilisation of social capital.

All three of these historical studies help to contextualise current approaches to the study of social capital. The current approach may be summarised as dominated by the view that Putnam popularised, focussing on individual engagement in civil society, but such an approach runs the risk of underplaying the role of public institutions in both the creation and preservation of social capital. State control must be carefully controlled, as too much interference can stifle the creation of social capital and too little control can lead to the manipulation of social capital by local elites to their personal benefit. This research will be mindful of these outcomes in the proposals it develops after analysing the data collected about social capital in the case study communities.

#### **2.5.6 Lessons about social capital to be taken forward by this thesis**

Social capital, as reviewed in this section, is revealed as a dynamic feature of all communities. It is manifest in the relations between community members and also between the community and external institutions. This research is mainly interested in the collective manifestation of social capital, embodied in the relations between flood risk communities and institutions responsible for the management of flood risk. One important issue to note for this research is that when internal social capital is low the potential to mobilise capital resources for the collective good may be limited. When internal social capital is high, then the potential for capital resources to be mobilised for the collective good will also be high. This research will seek evidence to further understand the relationship between internal (individual) and external (collective) dimensions of community social capital.

It is clear that social capital is self-reinforcing, hard to engender when existing stocks are low and easy when existing stocks are high. For this research, an assessment of

internal and external relations will help to determine stock of social capital in the case study communities. Individuals will be asked to identify links to social institutions, which will be classified as internal or external and whether or not they have any role in the management of the local flood risk.

Moving beyond the existence of relations, some qualitative measure of trust and reciprocity will help to judge the strength of relations. To that end, evidence of adaptations to the local flood risk within the community and effective negotiations with external institutions to address the flood hazard, will be taken as signs of high social capital. Evidence of civic engagement to address local flood issues and the flow of flood risk management information within the community will be taken as indicators of social capital being mobilised to address the local flood hazard for the collective good.

Being able to differentiate between actions undertaken for the collective good and actions undertaken for private good will be important for this research. Social capital mobilised to protest about perceived social injustices will be judged to be depleting social capital resources, but working for the collective good. Actions that point to the misuse of resources or to maintain hierarchies will also be judged to be depleting social capital resources and will be judged to be working towards the private good.

External bodies have the power to influence how the community utilises its social capital, either for the collective or individual good. Evidence of external bodies tightening their grip on local flood risk issues could potentially deplete community social capital if directed to the individual good, or increase social capital if directed to the collective good. In addition, evidence of external bodies regulating community behaviour by normalising patterns of behaviour in respect to flood risk can

strengthen actions that contribute to the collective good. Evidence of these actions and effects will be sought within the case study communities.

The state and other public bodies play an important role in facilitating the creation of social capital and in preventing its depletion through misuse. The role of the public bodies however, is a delicate one, treading a line between being overbearing to being too distant. Efforts to use social capital as a means to achieve flood risk management goals may not be effective, either because they run contrary to the culture of the community or because they undermine established institutions.

Evidence of deliberate attempts to utilise social capital to address a local flood risk issues by state and other public bodies will be sought, as well as any evidence of resistance to this approach from local communities and local institutions.

Social capital is enhanced when used in conjunction with other capitals, but its relative importance in relation to economic, human, physical and cultural capital when used to tackle flood risk is not yet clear. This research will seek opinion from participants engaged in the project to judge the importance of social capital, relative to those other forms of capital, when communities take action to address the local flood risk.

## **2.6 Conclusion**

Throughout this chapter important concepts for this thesis have been explored and, from this exploration, a rubric for the examination of the concept of community resilience has begun to emerge. At the end of each section, issues of important for this thesis were highlighted, so in this section those issues are collated and re-presented as the basis upon which the research methodology can be devised. The

outcome is a framework incorporating areas for further investigation relating to resilience, community research, social institution research and social capital. As the case study for this research focusses on communities exposed to a flood hazard, steps in the rubric are presented with tailoring to address this specific scenario.

### **2.6.1 Community resilience**

Building on the work of authors who have studied how resilience develops in individuals (Jacelon 1997, Mallak 1998, Cairns 2002 and Seaman *et al.* 2005), this research will apply lessons learned to the flood risk communities. For this research, the lessons will be applied not at the individual, but at the collective level. The hypothesis in this case is that individual level resilience maturity criteria can be used to make a similar judgement of a community's resilience. The expectation is that such a system will enable a community's resilience to be mapped onto a scale to indicate low (child level), moderate (adolescent level) or high (adult level) community resilience.

Drawing from the work of Mallak (1998) and Doron (2005), this thesis recognises that community resilience is supported by a layer of individuals, each with their own resilient potential. Whilst individual level resilience is not the main focus for this research, the link between individuals with potentially low, moderate or high resilience and the overall resilience of the community is not clear. The author suggests that better understanding that link will be of practical value when developing proposals to improve the resilience of a community. This thesis will explore the utility of combining individual level resilience data with social capital analysis to identify individuals within communities capable of playing an important role in enhancing community level resilience. The success of efforts to combine

social capital and resilience research in this manner will be an important academic outcome from this research.

This thesis will also focus on the extent to which the flood risk management system has moved beyond traditional approaches to hazard management and embraced multiple viewpoints and public/private participation (Bosher *et al.* 2007, Homan 2003, Oven *et al.* 2012 and Tobin & Whiteford 2002). This element of analysis will provide an important up-date on the extent to which current academic theory has been recognised by the flood risk practitioner community and embedded into flood risk management policies.

### **2.6.2 Flood risk communities**

When conducting research that explores the flood risk communities, the author is mindful that academic authors in recent years have questioned the utility of the community concept (Amit 2002, Day 2006, Delanty 2003). In this thesis, the validity of that critique will be assessed. The value of that assessment will be judged by contrasting critical comments derived from the literature against findings from an exploration of how the flood risk management institutions apply the community concept in their practice. Exploring how flood risk management institutions apply the community concept addresses work done by several researchers, which noted a growing divide between academic and institutional interpretations of the community concept (Gottdeiner and Budd 2005, Frankenberg 1969, Marsh and Buckle 2001). The exploration undertaken by this research will provide a contribution to the on-going debate and shed light onto the reasons for the growing academic-institutional conceptual divide.

This thesis will also address the issue of community-state interaction. Several authors have highlighted that communities are featuring more prominently in political policy and political actors are either seeking to “engineer” community actions or force communities to take on roles traditionally associated with the State (Crow and Allen 1994, Delanty 2003, Hill 2000). Evidence will be sought to judge the extent to which these allegations hold true within the context of UK flood risk management and assessed in relation to their impact on efforts to enhance the resilience of communities.

An important lesson from the community literature, related to the effect that local elites have on the goals and values of the communities in which they are situated (Anderson 1983, Bell and Newby 1971, Crow and Allen 1994, Hill 2000). That said, individual and collective patterns of behaviour are constantly changing, so this thesis will analyse the extent to which the case study communities demonstrate stratification along the lines predicted by the published research. Associated with that analysis will be an assessment of the significance of assertions made by some researchers that the power of the traditional elites in modern communities has been diffused (Amit 2002, Day 2006, Delanty 2003, Marsh and Buckle 2001).

The final issue drawn from the community literature and taken forward by this research will shed light on one important aspect of modern community membership, namely the sacrifice of individual freedoms that individual members have to make as a price for membership of the community. This issue was the focus of work by Booth-Fowler (1995), Etzioni (1995) and Bauman (2001) and they suggested numerous ways in which an acceptable balance may be struck and also how that balance is influenced by the nature of the underlying community. Data gathered by

this thesis will directly contribute to those threads of research and work to deepen the established understanding of how flood risk communities fit within such a theoretical framework.

### **2.6.3 Flood Risk Management (FRM) and community based social institutions**

Lessons learned from the social institution literature will first be applied in a practical manner to identify institutions that make up the UK Flood Risk Management (FRM) community and to analyse the case study communities, so as to identify institutional entities that exist at the sub-community level.

By way of taking forward issues raised by the literature, this thesis will explore how the institutionalisation process is manifest in the case study communities.

Specifically the thesis will focus on the issue of how roles can be manifest as institutions in their own right (Berger and Luckmann 1966, Hodgson 1988, Lopez & Scott 2000, Pelikan 2003, Hay 2004). Using an understanding developed from the literature, this research will assess the importance of role institutions in the flood risk communities and also within the FRM institutional framework.

This research will also explore in greater depth the theme of institutional openness (Hassard 1993). FRM institutions will be assessed using criteria proposed by Hassard and a judgement made as to the utility of such a measure in research designed to enhance community resilience by promoting the development of relations between communities and institutions.

Moving on from the issue of institutional openness, this thesis will also explore the issues of power, coercion and resistance within institutional frameworks (Brinton and Nee 1998, Hodgson 1998, Parboteeah and Cullen 2003, Wicks 2001). Lessons

about how power is acquired and how coercion and resistance are applied, within the context of managing flood risks, will be developed from data gathered by this project.

Lastly, issues relating to policy networks will be examined in more detail (Ensiminger 1998, Kenis and Schneider 1991, Marin and Mayntz 1991, Pelikan 2003, Scott and Meyer 1994, Silva 2007). Policy networks were described as large, flat and decentralised governance structures, but they can introduce risks associated with the formation of power structures, cliques and factions. For this research, evidence of such influences at work in the FRM institutional framework is important to assess.

#### **2.6.4 Community-Institution Social Capital (CISC)**

When taking forward issues from the social capital literature, the author will be applying lessons learned to analyse a very specific form of social capital, namely community-institutions social capital (CISC). CISC is not well articulated in the published literature, so this research will make a considerable contribution to enhance current levels of knowledge and understanding of CISC.

The first issue taken forward for further investigation relates to how CISC may be manifest differently at individual and collective levels (Putnam 1993, Haerper *et al.* 2005, Catts 2007, Mohan and Mohan 2002). Understanding how CISC is manifest at these levels will be important in building an understanding of how CISC can be used to enhance community resilience.

The established literature raised questions about the relative significance of social capital in relation to other forms of capital (Grew 2001, Rosenband 2001, Rotberg 2001, Dixon 2005 and Kovalainen 2005). Within the narrow focus of this research,

answers to those questions are less well understood. This research will collect data to assess the relative significance of social capital in addressing flood risk issues, but also in assessing the relative significance of CISC to social capital more generally.

Relating to the latter point, the link between CISC and the long-term stability within the FRM framework will be explored. The potential for institutions to incubate and mobilise social capital has been well documented (Adger 2000, Radcliffe 2004, Rosenband 2001), so this thesis will add to the established understanding by investigating the potential for transferring those lessons about social capital to the study of CISC.

## **Chapter 3. Methodology**

### 3.1 Introduction

In Chapter 2, published literatures relating to the concepts of resilience, community, social institutions and social capital were analysed. The author is mindful that, throughout the analysis of published literature, there was scant evidence of studies that have addressed the topic of community resilience by collectively using the four key concepts identified by this research. Each of the four concepts is a field of enquiry in its own right and possesses its own research tradition. For this thesis, the challenge was to draw upon the experience of techniques used in each field separately and to unify them in a way that did not do a disservice to the established orthodoxy and also did not undermine the credibility of the findings from this study.

By way of initiating the development of the research framework, Section 3.2 provides some context to the methodology, as part of an on-going tradition of research in the field of geography (Berg 2003, Brenner 2001, Cloke *et al.* 1991, Daniels *et al.* 2001, Fairhurst 2002, Kenis & Schneider 1991, Knox 2000). In Section 3.3, the author sets out the rationale for the use of a case study approach (Kitchen and Tate 2000, Yin 1993 and 1994). Section 3.3 also explains the basis for choosing flood risk as the case study scenario and the Teign Estuary as the location of the case study communities to explore community resilience. Section 3.4 describes the specific techniques used for data collection, which includes document analysis, observation, a questionnaire survey and in-depth interviews with incumbents of key institutional roles close to the case study communities. Section 3.5, explains how the collected data was analysed and the final section, Section 3.6, explores issues to do with the positionality and reflexivity of the researcher.

### **3.2 Community resilience from the geography perspective**

Research in the field of geography dates back to the eighteenth century, when a tradition now known as “Classical” Geography research was popular (Daniels *et al.* 2001). Classical research in that sense was based on the exploration and description of the physical and human geographies of the world. During the 1870s, the discipline began to organise itself into “deterministic” and “regionalist” approaches to research (Cloke *et al.* 1991). In the deterministic approach, human geographies were judged to be shaped by the physical environment in which they were situated. In the regionalist approach, local human geographies were clustered together to reveal regionally distinct traits and patterns of behaviour. These research approaches are useful for this project, which in the “classical” sense was seeking to explore and describe flood risk communities. In the “deterministic” sense, the communities chosen for closer inspection were defined by the flood risk environment in which they were located. From the “regionalist” perspective, being able to discern traits and patterns of behaviour within flood risk communities, as distinct from surrounding communities, is of particular interest to this research.

After the Second World War, some geographers became frustrated with the lack of clarity inherent in the classical methods and proposed a more “positivist” approach (Cloke *et al.* 1991). To Knox and Pinch (2000), the positivist turn defined the point at which a “Spatial Science” approach began to dominate geography research. At the core of the new approach was recognition that, in addition to being able to locate and describe where things are, geographers must be able to explain why things occur where they do (*ibid.*). In this research, a positivist spatial science approach will also

be helpful, as the author is not just seeking to identify specific features of communities in areas prone to flood risk, but also to explain why these features exist.

For Knox and Pinch (2000), the positivist spatial science approach was limited by its ability to take account of the underlying human and structural influences that govern the patterns and processes in society. As a consequence, “behavioural” and “humanist” approaches to the study of geography grew in popularity during the 1980s (Daniels *et al.* 2001). The view in this respect was that social patterns and processes in society were a reflection of the perceptions and intentions of humans as conscious agents (Cloke *et al.* 1991, Daniels *et al.* 2001). Both of these theories accepted that human action produces structure at the same time as structure produces human action (Cloke *et al.* 1991). This thesis was interested in the interplay between the structure created to manage flood risk in the UK and human actions within flood risk communities. As such, understanding how agents (re)produce the structures that have a role in that interplay will be important for understanding how community resilience is created and maintained.

Recent developments in “critical” geography suggest that all taken-for-granted research methodologies are in need of change (Berg 2003). To Berg, change is needed to enable progress to be made in challenging and moving beyond common-sense understandings of human-spatial relationships. Structuralism is one such approach that has undergone a “critical re-branding”. The rebranded approach is distinguished as post-structuralism and may be seen as a natural outcome from the blending of behavioural and humanistic approaches. The new approach emphasises the need for macro- and micro-level enquiry, as well as the use of extensive and intensive research methods (Brenner 2001, Fairhurst 2002). However, a clearly

defined structuralist approach runs the risk of criticism, depending on whether the researcher interprets meaning from an agency or an institutional viewpoint. Despite that perceived limitation, the fact is that geography has not abandoned structuralism, and post-structuralism could be viewed as simply taking a more holistic view of structuralism (Kenis and Schneider, 1991). For Kenis and Schneider, new tools like social network analysis have invigorated the new post-structural approach. In this research, a structuralist approach, blending macro- and micro- level research with extensive and intensive techniques is favourable. Post-structural augmentation using social network analysis was viewed by the author as the best means of drawing together much of the collected data.

In summary, for this research, the approach used to study community resilience will build upon the classical traditions in geography by identifying and describing communities at risk from flooding. In line with a deterministic geography tradition, the methodology will seek out features in the communities that help to explain how the communities have adapted to their environment. Using a regionalist geography approach, common traits and patterns of behaviour will be sought that help to distinguish flood risk communities from other surrounding communities. Learning from the positivist and spatial science approaches to geography research, a blend of qualitative and quantitative data will be collected to help explain why things occur where they do. As suggested by behavioural and humanist geography traditions, the data collected will focus on both structure and agents in the research sample.

Lessons from the structuralist tradition of geography research dictate that extensive and intensive data collection methods are used and, from post-structuralism, the use of social network analysis will help develop an understanding of the data collected.

### **3.3 Using a case study approach to study community resilience**

Building on the framework of issues to be taken forward by this research (outlined in section 2.6), this section can begin to elucidate a methodology upon which data needed to develop a better understanding of community resilience can be obtained. When evaluating methods for conducting the research on this project, it became clear that a case study approach would be appropriate. Case study approaches provide a very effective means of compiling the diversity of data needed to evaluate a complex phenomenon such as community resilience (Kitchen and Tate 2000, Yin 1993 and 1994). In this section, the academic rationale for the case study approach is outlined, followed by an explanation of the rationale for selecting flood risk as the scenario and the Teign Estuary communities as the case study subjects.

#### **3.3.1 The academic rationale for a case study approach**

According to both Kitchen and Tate (2000) and Yin (1994), when attempting to build an understanding of contemporary phenomena in a real life setting, case study research has proven to be a very effective tool. A particular strength of the case study approach is the ability to synthesize data collected using multiple methods, about multiple variables and from limited data sources (Yin 1994). Some authors have even suggested that the more complex the problem to be analysed, the better the case study approach performs (Kitchen and Tate 2000, May 2001, Yin 1993 and 1994). According to Yin (1994), case study research runs the risk of providing little scope for the development of broad generalizations. The ability to generalise is directly related to the number of case studies reviewed and the researcher must judge the merits of focussing on either a single case or to include multiple case studies (ibid). The decision of how many case studies to include in the research

project will also have an impact on the credibility of the findings (Kitchen and Tate 2000, May 2001, Yin 1993 and 1994). In this research, the aim is to develop theoretical propositions with sufficient credibility to have more general applicability outside of the case study area. To that end, the author chose to investigate multiple case studies communities and, by way of providing some basis for comparing results from the different case study communities, took care to select communities that share a common vulnerability to the same source of flood risk. Specifically, each case study community is exposed to the risk of tidal flooding and storm surge from the same source, the Teign Estuary in South Devon.

When designing a case study, May (2001) suggested that the researcher must determine whether the phenomenon being studied will include a single “holistic” variable or included multiple “embedded” variables for analysis. The aim of this research is to develop a better understanding of community resilience, which may be described as the holistic variable, or phenomenon, at the centre of the study.

Embedded within that aim is an additional sub-element that seeks to explore the relationships between institutions involved in flood hazard management and communities at risk from flooding. By better understanding the relationships between institutions and communities, it will be possible to demonstrate how institutions and communities can work together to engender social capital and mobilise that capital to improve community resilience. Social capital becomes an embedded phenomenon within the overall study and the theoretical proposition is that the relationship between the two phenomena is currently unclear. At a deeper level, and within the social capital phenomenon, is embedded a third variable that centres upon a particular form of social capital, specifically social capital derived from links between communities and institutions. The issue here is that the significance of such capital,

in relation to other capitals within a community, is not clear. The author's hypothesis is that such capital plays an important role in improving community resilience.

The main unit of analysis is another important consideration for case study research and can be focussed at the individual, community or societal levels (Kitchen and Tate 2000). The methodology will include units of analysis at all three levels. The primary unit for analysis is the "community" and there are four communities being studied in this research: the FRM institutional framework community and the three flood risk communities. Individuals are sub units within the communities and are divided into three types: members of the flood risk communities, FRM role incumbents and institutional entities. Societal units are clusterings of the FRM institutions, defined by the geographical level at which they operate. The societal cluster levels are defined as the local, district, county, region, national and international levels.

One risk with case study research is that the approach may lead to the collection of an overwhelming amount of data, which could take a long time to amass and result in an unreadable thesis (Yin 1994). To this end, the author carefully considered whether approaches adopted will provide explorative, explanative or descriptive evidence (Yin 1993). The exploratory case study approach is mainly used as a prelude to further research and is often undertaken prior to drafting the final definition or study question and the path followed may be intuitive. For this research, an exploratory approach will be used to identify communities, using both physical signposts within the environment, documentary records and verbal evidence. Explanatory case studies seek to build understanding of causal effects of variables on the phenomenon being studied. An explanatory approach will be used in this

thesis to build an understanding of the links between individuals, communities and societal units. Descriptive case studies help to define the scope and depth of the case being described, or provide contextual material that will help with interpretation of any contemporary narrative collected from respondents (May 2001). A descriptive approach will be used by this thesis to interpret data gathered and build a deeper understanding of the phenomenon at the heart of this research, namely community resilience.

### **3.3.2 Flooding as the case study scenario**

A study by the United Nations organisation (Pilon, 2002) found that one third of all global losses resulting from natural catastrophes were due to flooding and it determined that the frequency of flood events was increasing. The UN report also found that flooding accounted for two thirds of all the people affected by natural catastrophes across the globe. In another study, the World Meteorological Organisation (WMO, 2004) found that during the 1990s, 1.5 billion people across the world had been affected by floods. In particular, the year 2002 stood out as a very bad year for flooding with millions of people affected across Europe and the UK (ibid). Against such a backdrop, it is clear that research aimed at achieving a better understanding of how to mitigate the impact of flood events on vulnerable communities will be of interest to researchers across the globe.

In Europe, a report by the European Commission (EC, 2004) confirmed that the EU suffered 100 major floods resulting in 700 mortalities, 500,000 displaced persons and 25 billion Euros of damage between 1998 and 2002. The European Environmental Agency, in a slightly longer timed study, identified floods as the most common form of environmental disaster in Europe and counted 154 major floods

between 1971 and 1995 (EEA, 2001). According to the Environment Agency of the UK (EA 2001), the year 2000 was the wettest year for 270 years and precipitation during the period of October to November of that year created the highest peak level floods ever recorded. In the year 2000, floods occurred in 700 locations across the UK, with some areas flooded for the first time in their recorded history. Flooding in the year 2000 damaged 10,000 properties and resulted in 11,000 people being displaced (ibid). As this thesis went to print in March 2014, many communities across the UK were suffering from one of the worst episodes of winter flooding for several decades. Hence, outcomes from this project, which aim to deepen understanding of how to make flood risk communities more resilient, will be of interest to both members of the European Community and nationally across the whole of the UK.

A flood can last minutes (flash floods) or weeks in larger water systems and the effects are wide ranging, including human trauma, environmental and property damage as well as illness from pollution and water related disease (Hamill 2001). Floods can also lead to development blight, as insurance cover becomes difficult to secure in regions subject to flooding (Demeritt and Norbert 2011, EC 2004, Porter and Demeritt 2012). However, it is also important to note that flooding is not a new phenomenon, or as the European Environmental Agency put it, “floods are natural features of running water systems” (EEA, 2001,p1). What those authors highlight is the fact that interaction between humans and flood events has been on-going ever since humans began developing settlements along coasts and riverbanks. Also, they highlight that the benefits of living in these locations has often outweighed the risks. Benefits to living in flood risk areas include easy access to fertile agricultural land, land that is flat and easy to develop, ready access to water for consumption or for

sanitation, direct links to transport routes and industrial centres (ibid). A long history of community-flood interaction provides for a complex blend of deep rooted cultural beliefs and patterns of behaviour that are well suited to the challenge that this thesis is aiming to address.

In 1993, the UK Government (MAFF/WO 1993) determined that 8000 square kilometres of UK land lie below the 5 metre contour and were thus susceptible to coastal flooding. Within that area 5 percent of the nation's population lived, and 50 percent of Grade 1 agricultural land was situated (MAFF/WO 1993). A more recent survey (MAFF 2001) identified that, across the whole of the UK, 10 percent of the population was living in flood risk areas. In 2001, it was estimated that £200 billion worth of property in the UK was at risk from flooding as was 12 percent of the total agricultural land bank, including 61 percent of Grade 1 agricultural land (ibid). Also in 2001, the Environment Agency estimated that floods would cause £3 billion of damage annually if flood defence measures were removed (EA 2001). The scale of flood risk and the potential cost of damage to the social infrastructure of the UK suggests that further research that enhances the current understanding of how best to protect communities would be welcomed by FRM institutions.

WMO (2004) and Lancaster *et al.* (2004) identified numerous phenomena that can cause flooding and they found that the general population of the UK is familiar with the most common causes of floods namely rain, tides, storm surges and wave action. From an academic perspective, floods are often classified according to the mechanism that triggers the event, i.e. dam breaks, excessive overland runoff or failure of drainage infrastructure (Hamill 2001). Researchers group these events into three categories: fluvial (or river flooding), coastal (including estuaries) and pluvial

(or overland flooding). These findings point to a growing divide between actors with an interest in flood phenomena and, as state resources become stretched and greater emphasis is placed on communities to become more self-reliant, research is needed to better understand the gulf that exists between academic, policy and public knowledge about flood risk.

In July 2004, the Department of Environment, Food and Rural Affairs (DEFRA) launched a consultation exercise to review the context within which flooding is managed in the UK (DEFRA 2004). Specifically, the consultation focussed on risk management, sustainability, planning, awareness and (most importantly for this research) resilience. The purpose of the exercise was to formulate a strategy for the whole-scale improvement of the UK flood risk management system. DEFRA proposed a multi-level framework taking account of environmental, social and economic factors which aimed to strengthen stakeholder involvement, standards of protection and affordability of flood protection schemes (*ibid*).

The 2004 DEFRA consultation exercise supported the development of "Catchment Flood Management Plans" under the umbrella of "River Basin Management Plans" and linked planning measures to the EU Water Framework Directive (DEFRA 2002). One of the drivers for such an extensive network of plans was the Future Flooding Project (Evans *et al.* 2004). The Foresight report focussed on climate change impact predictions, including hotter and drier summers, more wet winters and increased frequency of extreme high water levels along the coast. Importantly for this research, the frequency of extreme high water levels has been predicted to increase by 10-20 times over the next eighty years (Hulme and Jenkins 2002). These changes would see the scale of coastal flooding and erosion increase by as much as 4-10 times

current levels over the next 100 years (Evans *et al.* 2004). For this research, these predictions make any findings from a coastal flood based study both timely and imperative.

For DEFRA, any future flood risk management system would need to place equal emphasis on urban and rural development schemes to alleviate flooding problems (DEFRA 2004). Undeveloped space in rural areas would be considered for flood alleviation by setting back flood defences, creating wet grassland, reed beds and swamps and urban development would only be permitted when it did not add to the flood risk (*ibid*). DEFRA's approach echoed earlier Government recommendations, which stated that more work was needed to develop accurate methods for flood risk assessment and more effective options for incorporating flood resilience measures (ODPM 2003). What this shows is that flood risk and development planning are intricately linked, so findings that can improve the effectiveness of planning decisions and that have a direct effect of improving the resilience of local communities to flood risk is likely to be appreciated by multiple policy groups.

Barker (2006) was alarmed to find that substantial areas earmarked for development across the UK were in areas of high flood risk. According to the flood risk management system outlined by DEFRA (2004), in such cases, development should be prevented or appropriate flood defence measures incorporated as part of the development proposal. Planning Policy Guidance note 25 (PPG25) published in July 2001 provided Government guidance on planning for flood risk and stated that new housing should be protected against a 1percent probability flood risk or a 0.5 percent flood risk from coastal flooding. Despite PPG25 about 11percent of new houses were built in flood risk areas between 2001 and 2003 (Barker 2006). In response to

the continued development taking place in flood plains, DEFRA made the Environment Agency (EA) a statutory consultee for all planning applications in flood risk areas (DEFRA 2004, Porter and Demeritt 2012). Applications approved against the advice of the Agency are unlikely to receive insurance cover or be able to secure mortgages. What is evident here is that there has been a shift in the power distribution between development planning institutions and those responsible for managing flood risk. That shift may have the effect of blurring roles and responsibility when it comes to decision-making on flood risk issues. Such confusion will impact on the ability of flood risk management institutions to enhance community resilience, so this research will be helpful if it can identify the scale and extent of this potential problem.

To improve the coordination and management of flood risk in local communities, more direct government intervention is needed, forcing institutions to engage in an integrated planning approach (Audit Commission 2002, Demeritt 2012, McEwen *et al.* 2012). DEFRA (2004) described two objectives to improve flood resistance in building, namely resistance and resilience. It defined these as reducing or preventing water from entering buildings and facilitating the recovery of buildings respectively. In that respect, the government plans to use the building regulations to ensure that flood resistance and resilience is included in new buildings. This will be achieved by enhancing existing regulations (parts H and C), which already provide some reference to the protection against floods. The Sustainable Task Group Report (DTI 2004) noted that the building regulations do not cover existing buildings, so in these cases, it is up to the owner to invest in flood protection measures. To assist homeowners, the BSI and CIRIA organisation have published guidance on the ranges of products available for flood protection. Insurance was also seen as a key

element to incentivise the uptake of flood protection products (DEFRA 2004).

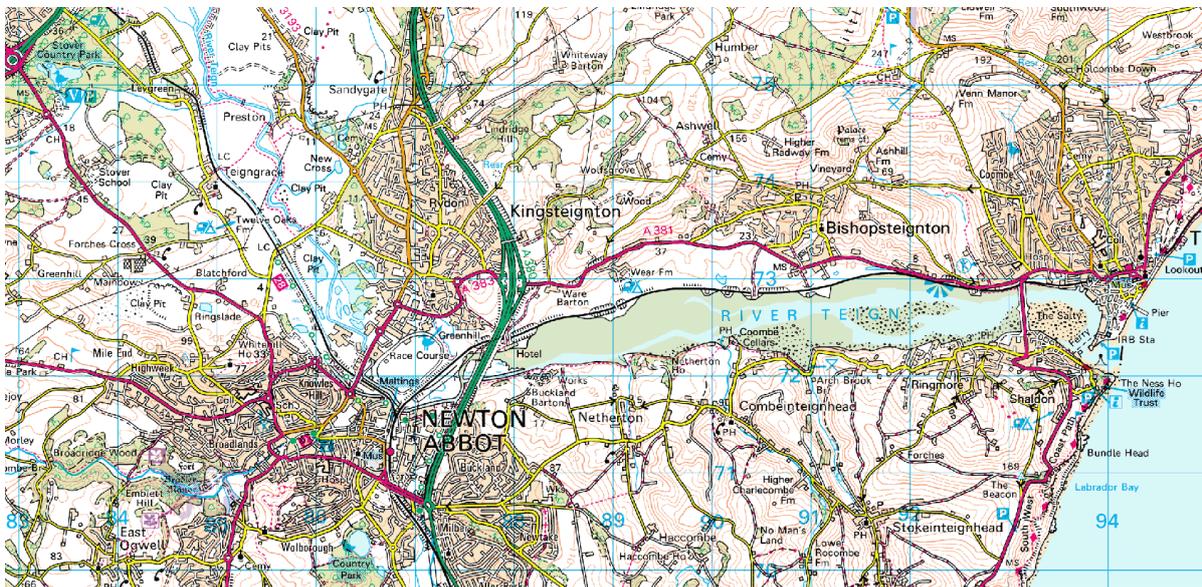
Understanding how all these public and private organisations work collectively to help local communities become more resilient to flooding will be important and this research can help to shed light on the role of these parties within the flood risk management framework.

Any future flood risk management system would also need to recognise the importance of raising awareness of flood risk among flood risk community members (Demeritt 2012, Demeritt and Norbert 2011, Pappenberger *et al.* 2013, Porter and Demeritt 2012). The Civil Contingency Act 2004 provides the framework within which such a system can operate (HMG 2004). The new civil contingency arrangements recognise that individuals can be relied upon to reduce the consequences of flooding if they are given appropriate advice and sufficient warning. Flood awareness campaigns have been organised by Local Flood Defence (LFD) Committees, with support from the EA and Central Government. In addition, the Government has supported the creation of 50 local flood action groups and their national representative body the National Flood Forum (DEFRA 2004). Here again, the role of different agencies in planning for flood events is changing and this research can help to clarify what effects these changes are having on the resilience of communities exposed to flood risk.

### **3.3.3 The Teign Estuary flood risk communities**

The River Teign is 48km in length and its catchment drains an area of 520 square kilometres of the South Devon countryside (Royal Haskoning, 2007). In the Teign Estuary, there are four main population centres (Newton Abbot, Teignmouth, Shaldon and Kingsteignton) and these communities have experienced many

different forms of flooding in the past (ibid). In Newton Abbot, a breach of the Hornbeam dam is a significant pluvial risk, fluvial floods from excess water in the rivers Lemon and Teign are also a threat and flooding due to tides and storm surges travelling up the Teign Estuary also threaten the community. In Teignmouth and Shaldon, pluvial flooding combined with high tides have caused previous floods, but wave action and storm surge are also flood risks (DCC 2006a, Royal Haskoning 2007).



**Figure 3.1 The Teign Estuary showing major settlements (Edina Digimap, 2010)**

According to St Leger-Gordon (1963), there is some evidence that flood risk in the Teign Estuary has been exacerbated in recent times. To St Leger-Gordon, along the River Teign “excepting Teignmouth, no town or village has been built actually upon her banks” (p47). It should be noted that for this research, Shaldon is treated as a separate entity to Teignmouth, but this is not necessarily the case in the historical literature. It is possible that St Leger-Gordon includes Shaldon in his reference to Teignmouth (Shaldon being built on the bank of the estuary opposite Teignmouth).

St Leger-Gordon suggests that the reason that no other town or village was built on the river's banks is because of its “formidable reputation in olden times as a wild river” and this comment can be given some context by digging deeper into the history of the region.

Hoskins (1959) researched back as far as the Roman era for evidence of settlements in the Teign Estuary area. He judged that “in those times the Teign estuary communities were not really on the map”, but he did find evidence that there was a road crossing the Teign close to Newton Abbot. At the time of the Norman Conquest, most of the region between the Teign and the Dart was considered wild, wet country and, although important fisheries were established on the Exe and Dart, there is little written about communities on the Teign (ibid).

Jones (2006) stated that before the railway was built in 1848, the main settlement areas were far enough upstream to not be subject to the influence of the tides. The lower reaches of the estuary were described as marsh areas, always subject to flooding. By way of providing some context to the assertions that the area has “always been subject to flooding”, a study by Zong and Tooley (2003) identified 14 coastal storm events in the past 150 years that resulted in flooding along the South Devon coast. Bad years for flooding in the area were identified as 1861, 1894, 1938 and 1979 (ibid). According to Burgess (2001) and BMA (1907), the wettest winter in South Devon was 1903, the wettest summer was in 1918, but there is no mention of flood events associated with these years.

Newton Abbot has the clearest documentary evidence of historical flood events, with the most notable recent flood event being in 1979. The 1979 Newton Abbot flood caused “much damage and misery” (Jones 2006, p86), but the insurance industry

were praised for helping people recover. Chard (1993) describes the 1979 flood as “the worst flood for 40 years” (p64) and explained how the fire service, scouts, church groups and schools all helped the victims. Military personnel were mobilised to help victims, as well as the Lions Club and the social services. Another important element of the relief effort were neighbours, who provided much of the support for local victims (ibid). Chard, also described how council workers provided heaters and dryers and utility companies were quick to respond in repairing fuses and meters. As a direct consequence of the 1979 flood event, the Holbeam dam was constructed to protect residents of Newton Abbot from fluvial flooding. The Holbeam dam was commissioned into operation in 1982 and following its construction two notable events (in December 1989 and February 1990) have tested the system, but the dam has been successful in preventing flooding in the town (Jones 2006).

Turning to the other two study sites, Teignmouth and Shaldon, Worth (1986) described Teignmouth as a “place of resort in Saxon times” (p311). Hoskins (1954) described Teignmouth as the second oldest seaside resort in Devon (Exmouth is oldest). The first official record of its existence seems to date from 1001 in a report, which stated that “the Danes burned Tegntun” (ibid). In 1044, there is report of a church at Teignmouth, St Michael, where salt was manufactured. Worth explains that historically there were two parts to Teignmouth: East (belonging to the See of Exeter) and the West (belonged to the Dean and Chapter). He added that the West part was sold to the Earl of Devon in the 1800s. These two parts are still evident today as two of the main wards that make up the Teignmouth administrative area (DCC 2006b).

There are unconfirmed reports that Teignmouth may have been burned by the French in 1340, but records relating to the salt industry in Teignmouth from 1692 are

clear that the town was definitely sacked and plundered by the French in the 1600s (Worth 1986). By 1744, the town had recovered from the French incursion and was fortified by its population of 4000. The coming of the railway in the 18th century made Teignmouth a popular holiday destination and, in 1821, a new quay was built. During the nineteenth century, Teignmouth developed a considerable trade in fish, granite, pipe clay, manganese and timber. This trade supplemented a well-established ship building industry dating back several centuries (Hoskins 1954).

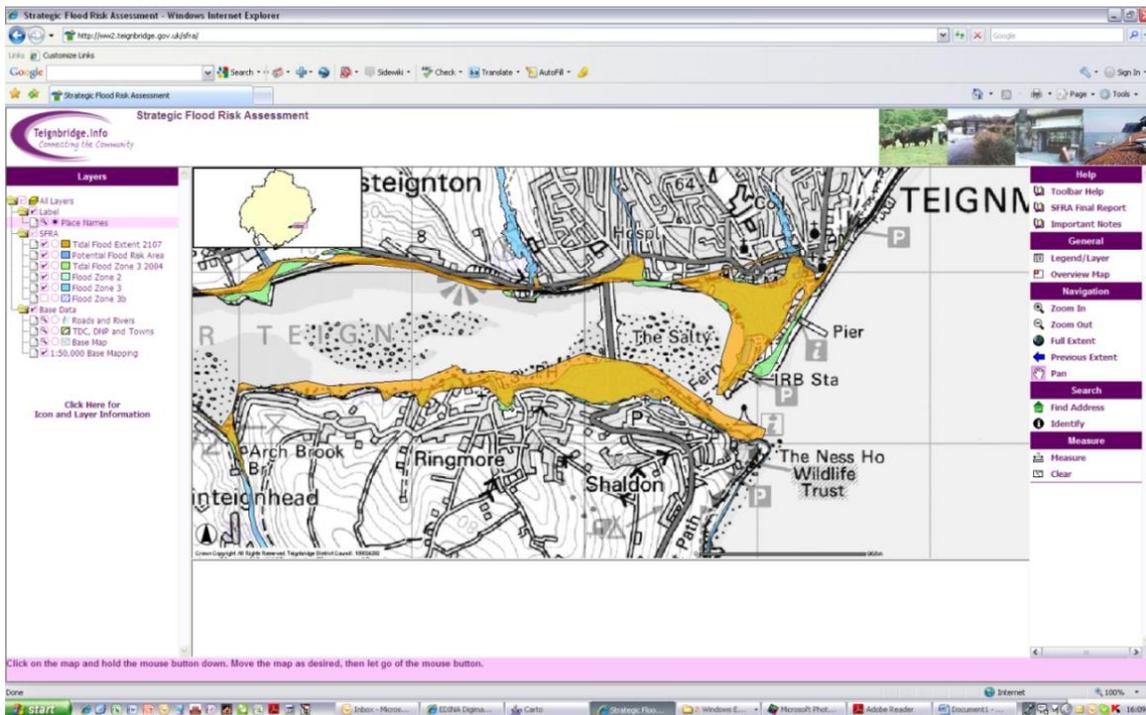
Shaldon is described by Worth (1986) as a “transfluvial suburb of Teignmouth, partly in Stokeinteignhead and part in Ringmore St Nicholas with no separate history of importance” (p314). According to Hoskins (1954), “St Nicholas consists of two villages, Ringmore and Shaldon, which were annexed to Teignmouth for urban planning purposes in 1881” (p470). Shaldon and Teignmouth were connected by a ferry until 1827, when Shaldon Bridge was opened. Shaldon is described as “a good place to idle away a summer morning” (p470).

In Teignmouth and Shaldon, the most recent flood event was in 2004 (Royal Haskoning 2007). The 2004 flood event in Teignmouth and Shaldon was caused by a high tide and storm surge (ibid). At the time when this research commenced, Teignmouth had a tidal wall designed for a 1:200 flood event, but Shaldon had only partial protection from flooding provided by its flood defence system (Royal Haskoning 2007).

Emergency planning records identified that a flood in the Teignmouth and Shaldon area could affect infrastructure, including the loss of water supply, sewerage, electricity, gas and telecommunications systems as well as damage rail and road networks (DCC 2006a). In the event of a flood incident affecting communities in the

Teign estuary, strategic command would be set up in Police HQ at Exeter, tactical control at Paignton Police Station (ibid). For Shaldon, the main evacuation briefing centre would be the Ness House Hotel with evacuation assembly point at the London Inn then moving to the Ness House Hotel. Emergency rest centres would be established at Teignmouth Community College, Coombshead College and Knowles Hill School (ibid).

Local Emergency Plans were not specific about vulnerable populations, but some street names were highlighted with estimates of the number of properties at risk – Coombe Road had 1 bungalow identified, Fore Street had 1 basement identified, Laurel Lane had 3 bungalows identified and Ringmore Lane had 5 basements and 3 ground floor flats identified (DCC 2006a). In Teignmouth, the list included approximately 80 properties, or less than 8 percent of total number of properties identified as being at risk by Haskoning (2007). Royal Haskoning (2007) identified that Newton Abbot, Teignmouth and Shaldon have 576 properties, 543 properties and 334 properties at high risk from flooding respectively. These records suggest that local emergency plans for dealing with flood events are not fully developed. That being said, according to DCC (2006a), both Teignmouth and Shaldon have an established flood warning system that is part of a general coastal flood warning system linked to the Plymouth Marine Observatory and the Met Office. Local residents can also gather information about the local flood risk by accessing flood risk maps of the local area on the Teignbridge District Council website (see Figure 3.2 below).



**Figure 3.2 Example of publicly accessible Flood Risk Map (Source: Teignbridge District Council, 2010)**

What this analysis reveals is that the three communities of Newton Abbot, Teignmouth and Shaldon have a long history and included in that history are flood events that have tested the resilience of the local populations. Flood events are not the most challenging threats that the local population have had to resist, but they probably rank highly amongst current threats to the three communities. It is clear from the historical record, that all three communities have undertaken actions to protect themselves from flood events in the past. These actions have often followed historical flood events and have been effective in preventing any significant flooding in recent decades. However, as planning for flood events have evolved, it is revealing a significant present and future threat that is not fully recognised by local authorities. Shortly before the commencement of this research, the Teignmouth community were presented with a plan to help them address the present and future

flood risk, but the community rejected the plan. As this research commenced, the Shaldon community was actively engaged with the flood risk management authorities to develop and implement a scheme to address their present and future flood risk. In Newton Abbot, no plan has been vocalised and no movement is apparent that either recognises or is concerned about the present and future flood risk.

### **3.4 Methodological techniques used for the research**

This section outlines the methodological tools used to collect data for this thesis. Data collection tools included documentary analysis, observational studies, questionnaires and interviews.

#### **3.4.1 Documentary analysis**

This research explores the interaction of communities with the environments in which they are located and researchers have previously established that details of such interaction can be found in documents and literature generated by the communities being studied (Kitchen and Tate 2000, Benko and Stohmayer 2004, Daniels *et al.* 2001, Cloke *et al.* 2005). This thesis has already drawn heavily on published academic literature to uncover information about the important theoretical concepts that underpin this thesis (Chapter 2) and local archival sources have been used to reveal details about the case study communities (Section 3.3). However, for this research, a more focussed and structured approach to the collection of data from documentary sources was needed, incorporating data that was specific to achieving the aim and objectives of this project.

According to Lounsbury and Aldrich (1979), documents are good for both extensive and intensive research and fit well with the research strategy as outlined in Section 3.2. Henn *et al.* (2006) pointed out that that some documents can be gained easily, but other may require solicitation. In addition, data obtained from documents may be biased or unsubstantiated and conclusions drawn from document sources must be carefully considered (*ibid*). Archives can present the researcher with a wealth of information, so sampling is an important consideration when using documentary research methods (Henn *et al.* 2006). These issues were considered and addressed as follows:

- **Document analysis for extensive research** – In this respect, documents were used mainly to identify institutions involved in flood risk management. In addition, documents were used to identify broad policy areas with an input into flood risk management practice.
- **Document analysis for intensive research** – documents were analysed to identify connections between institutions and roles that may be important for liaising with local communities. In addition, documents were analysed to develop a deeper knowledge of actions taken at the community level to address local flood risk issues.
- **Use of publicly available documents** – For the most part, documents analysed were drawn from the public domain via the internet. The rationale for this approach was that the aim of the research is in part to develop proposals that institutions and communities may use to improve community resilience. If the sources used by the research are publically available then it will be easy for others to access the same resources if they wish to act on the proposals.
- **Document solicited from the communities** – A limited number of documents were solicited from survey participants. Generally identified during interviews or informal discussions with questionnaire participants, who raised details about a restricted document as part of their response to questioning.
- **Dealing with bias or unsubstantiated evidence** – A bias was detected when the research revealed a distinct lack of documentation regarding flood risk management at community level, but significant amounts of documentation at national level. On questioning interviewees, that bias was confirmed as a true representation of the state of affairs with regard to flood risk management in the UK.
- **Dealing with the wealth of potential documents available** – In order to restrict the documents reviewed, a two stage “snowballing” selection process was used. For the first stage, responses from interviewees and survey respondents were used to guide the search for documents. For the second stage, links within the documents themselves were used to identify other documents for analysis.

By the end of the data collection activity, 60 documents were analysed in detail (see appendix I for a list of the documents and evidence of analysis).

### **3.4.2 Observational studies**

Observation is a classical field research tool in geography, good for collecting micro data, dynamic data and data with temporal sensitivity (Lounsbury and Aldrich 1979). Observational studies can also help to build a picture of how communities perceive and interact with their environment (Cook and Crang 1995, ESRC *n.d.*, Gould and White 1986, Kitchen and Tate 2000). According to Robinson (1998), observational techniques can provide data that other methods may overlook and can be quantitative or qualitative in form. Observations may also help to convey meanings that are pre-constructed and easily understood or that need constructing by the researcher (Robinson 1998). Observational techniques were used in this research to record dynamic data, charting the changes made to the Shaldon and Teignmouth communities by flood protections schemes that were undertaken during the time that this thesis was in development (2008-2012). Micro level data was captured of adaptations made to buildings within the case study communities in direct response to the threat of flooding (Appendix II contains details of evidence collected). Based on a quantitative assessment of observed structural adaptations, the author was able to make a qualitative judgement as to the prominence of flood risk perception within each community. This assessment is summarised in Figure 3.3 below.



(a)



(b)



(c)



(d)



(e)



(f)

**Figure 3.3 Observed forms of flood protection in case study communities**

**(Source: Author)**

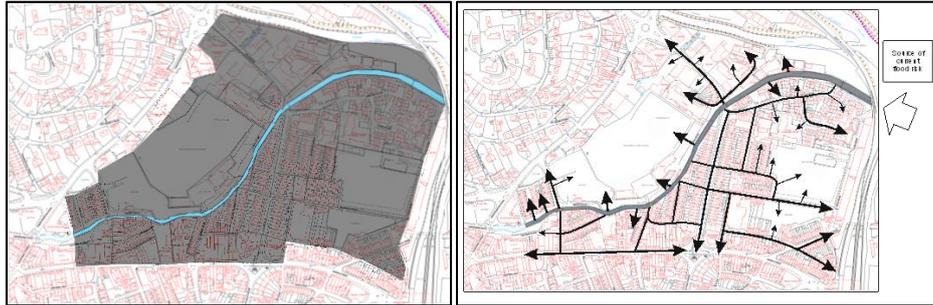
- (a) Flood board fitted to property
- (b) Flood wall constructed around property
- (c) Property raised above flood water level
- (d) Elevated access ramp
- (e) Sea wall
- (f) Channelizing the source of flood water

Observational studies can have an exploratory focus when little prior data exists, be reconnaissance focussed when conducted systematically to cover extensive areas in minimum time, or intensively focussed when exploring a specific area in more detail (Lounsbury and Aldrich 1979). According to Gould and White (1986), exploratory and reconnaissance observations can be a useful technique to employ when attempting to gain a sense of orientation and knowledge about the structure of a social space. For this research, an exploratory observation technique was used to identify the boundaries of each flood risk community. This task was not straightforward and a combination of observation, flood risk map data and questioning of local residents was needed to verify the boundary to the flood risk community. Once the boundary was established, a more intensive reconnaissance technique was used to systematically explore each community. The outcome from the intensive observation was a breakdown of each community based on land use classification (ODPM 2006) and divided into blocks based on a Source-Path-Receptor-Consequence (SPRC) approach (Fox *et al.* 2012). These results were overlaid onto a map of the area acquired from the Digimap service (Details of the mapping system can be seen in Appendix II).

In Newton Abbot, the reconnaissance observation resulted in the case study area being divided into 46 sub-areas with 521 land parcels (Table 3.1.and Figure 3.4).

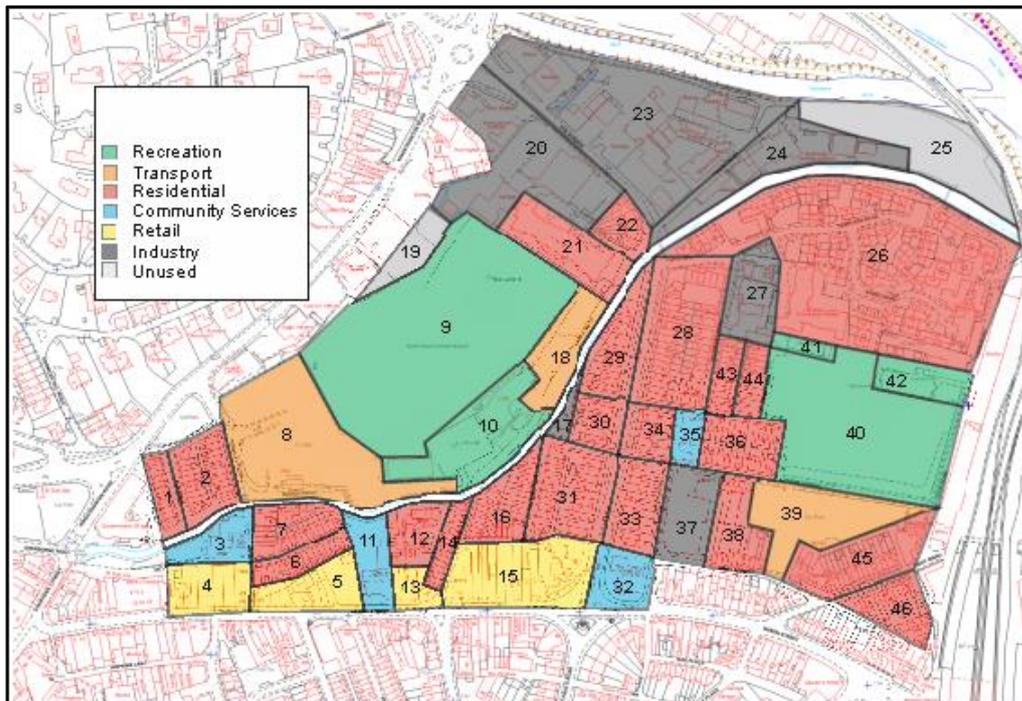
**Table 3.1 Newton Abbot Study Area Sub-division (Source: Author)**

Land Use classification	Sub-areas	Land Parcels
Residential	22	410
Retail	4	47
Industry and business	6	41
Recreation and leisure	5	8
Community Services	4	6
Transport	3	3
Vacant and derelict	1	1
Not used	1	1



(a)

(b)



(c)

**Figure 3.4 Observational system used to sub-divide case study areas**

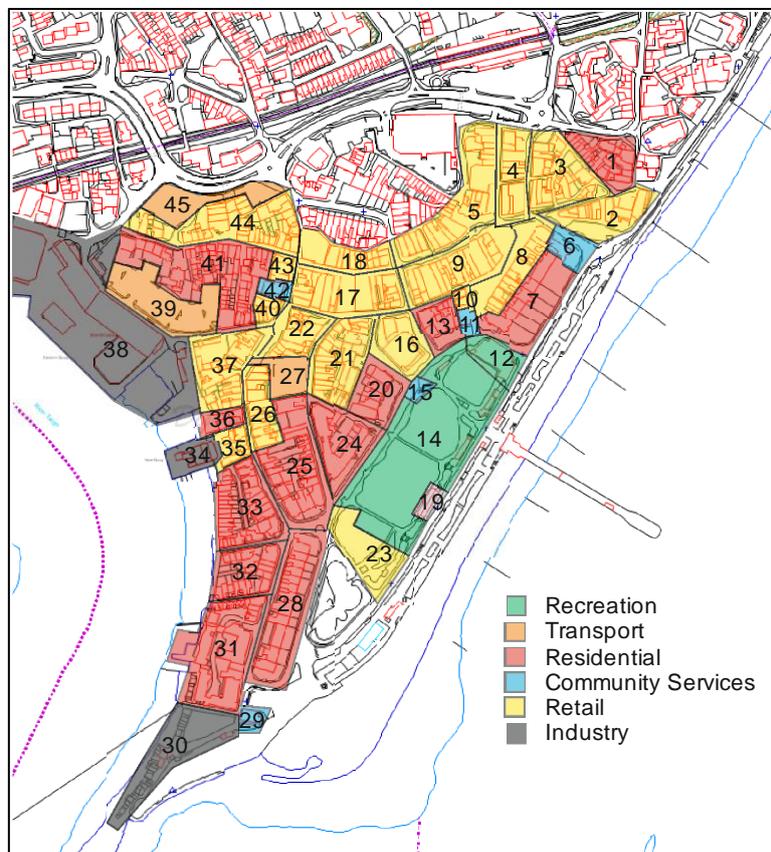
**(Source: Author)**

- (a) Identifying boundary of flood risk community
- (b) Mapping flood pathways from source
- (c) Sub-division and classification of study area

In Teignmouth, the reconnaissance observation resulted in the case study area being divided into 45 sub-areas with 479 land parcels (Table 3.2 and Figure 3.5)

**Table 3.2 Teignmouth Study Area Sub-division (Source: Author)**

Land Use classification	Sub-areas	Land Parcels
Residential	12	206
Retail	20	241
Industry and business	3	20
Recreation and leisure	2	4
Community Services	5	5
Transport	3	3
Vacant and derelict	0	0
Not used	0	0

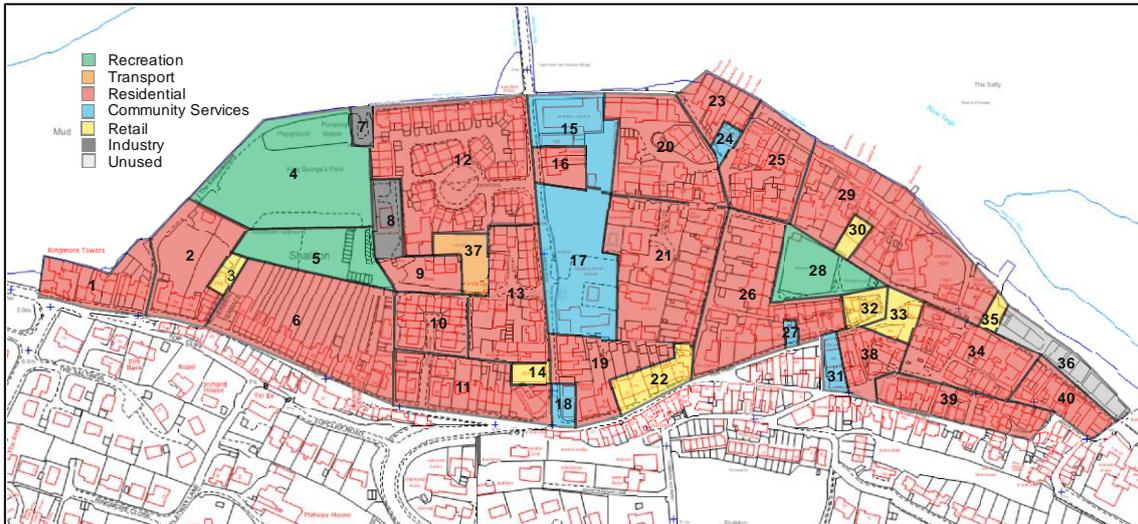


**Figure 3.5 Teignmouth study area with area sub-divisions (Source: Author)**

In Shaldon, the reconnaissance observation resulted in the case study area being divided into 40 sub areas, with 397 land parcels (see Table 3.3 and Figure 3.6).

**Table 3.3 Shaldon Study Area Sub-division (Source: Author)**

Land Use classification	Sub-areas	Land Parcels
Residential	20	347
Retail	7	22
Industry and business	2	2
Recreation and leisure	3	5
Community Services	6	11
Transport	1	1
Vacant and derelict	0	0
Not used	1	9



**Figure 3.6 – Shaldon study area with area sub-divisions (Author)**

### 3.4.3 Questionnaire survey

Questionnaires are another well-established research tool in widespread use across all sub-disciplines of geography. Issues that arise in the design of questionnaire surveys frequently focus on the quantitative or qualitative nature of the question formats, sample selection and bias derived either from the question design or the sample selection (Kitchen and Tate 2000, Cook and Crang 1995, Cloke *et al.* 1991 and 2004).

For the purpose of this research, a largely quantitative questionnaire was distributed throughout the case study areas. The questionnaire was directed at both individual

residents and institutions based in the flood risk communities. The questionnaire was developed to acquire resilience specific data, including direct and indirect experience of crisis events like flooding, at the individual and collective levels. Data was also sought about institutions and institutional roles that were active in addressing the local flood hazard and also about the level and relative significance of economic, human, physical, cultural and social capitals. Appendix III contains details of the questionnaire used in this study.

### **Pilot study**

The study area for this research was defined by the limits of a 1 in 100 year tidal flood event in Newton Abbot, Teignmouth and Shaldon (Royal Haskoning 2007). Of the three case study areas, Newton Abbot had the largest population and was chosen to test the questionnaire planned for the main survey. The pilot study sample size was limited to 10 percent of the main study target of 300 questionnaires (100 in each community). Based on the receptor map, created after the observational study, the distribution of the pilot sample was calculated in proportion to the ratio of land parcels in each land use classification category (Table 3.1 and Figure 3.4). The result was a total target sample for the pilot study of 30 questionnaires, with 22 questionnaires distributed in residential areas, 3 in retail areas, 3 in business areas, 1 in a recreational area and 1 in a community service area.

For the pilot study a single questionnaire was used, with respondents asked to indicate if they were individual or organisational respondents. Feedback from the pilot study indicated that respondents did not like the joint “organisational / individual” questionnaire format and so the questionnaire for the main study was modified to create two separate questionnaires, one for organisations and one for residents.

In addition, the author had intended to complete the questionnaire in person, working with respondents, but the pilot study revealed that respondents preferred to keep the questionnaire and complete it at their own pace. That finding demanded that the author adopt different system for the issue and retrieval of the questionnaires in the main survey. The new system involved leaving the questionnaire with respondents, returning 1 week later to retrieve the completed form.

Other than the two issues described above, the pilot survey respondents were broadly confident in their ability to understand and answer the survey questions. As a consequence no changes were made to the questions for the main survey.

### **Main questionnaire survey**

For the main questionnaire survey, the transport (car park) areas, vacant and derelict areas and not used areas had no settled human presence and were eliminated from the sample. The remaining areas included 1375 land parcels in which the 300 questionnaires would be distributed, or 21.8 percent of the number of parcels. Sampling targeted 20 percent of the parcels in each sub-area (Table 3.4), with respondents chosen by selecting every fifth parcel in the sub-area to create an even distribution of questionnaires throughout the community.

**Table 3.4 Targets for main survey study sample (Source: Author)**

Land Use classification	Newton Abbot	Teignmouth	Shaldon	Total
Residential	80	43	90	<b>213</b>
Retail	10	50	7	<b>67</b>
Industry and business	9	4	0	<b>13</b>
Recreation and leisure	1	2	0	<b>3</b>
Community Services	0	1	3	<b>4</b>
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>300</b>

In all, a total of 280 questionnaires were successfully issued across the three study sites of Newton Abbot (NA), Teignmouth (TM) and Shaldon (SH). The shortfall of 20 questionnaires compared to the target of 300 occurred in Shaldon where a high number of holiday homes were encountered and the author was unable to contact the owners.

The initial return rate from the main survey was 75 percent, but analysis of the returned questionnaires revealed a significant number of non-completed returns. For the purpose of this research, only completed questionnaires were selected for detailed analysis, resulting in an overall completion rate of 64 percent (Table 3.5).

**Table 3.5 Summary of completed questionnaires (Source: Author)**

<b>Survey distribution</b>	<b>Overall</b>	<b>NA</b>	<b>TM</b>	<b>SH</b>
Questionnaires issued	280	100	100	80
Returned	211	75	79	57
Completed	179	63	69	47
Completion rate	64%	63%	69%	59%

### **3.4.4 Institutional interviews**

Interviews are frequently used in association with questionnaire surveys, either as a means to deepen the level of data acquired from a questionnaire survey or as a means of delivering questions from a questionnaire (Gould and White 1986, Henn *et al.* 2006, Lounsbury and Aldrich 1979, Kitchen and Tate 2000). In this research, interviews were conducted with incumbents occupying roles identified either through the document analysis or from the questionnaire survey. The roles chosen for interview were those that had direct contact with the case study communities and who had some involvement in flood risk management.

From the community survey, no specific roles or role incumbents were identified within any of the three communities surveyed. The roles closest to the community were those within the Town and Parish Councils. All three local councils were approached for interview and interviews were successfully conducted with two councils (Newton Abbot and Shaldon). At the local council level, three roles were identified as having a part to play in managing local flood risk, namely the Parish/Town Clerk, Local Councillors and the Community Liaison Officer. For this study, the author was successful in conducting interviews with a Councillor and a Community Liaison Officer.

Moving beyond the boundaries of the case study communities, roles with direct links to the case study community and with an interest in flood risk management were identified at the district, county, region and national levels. At the district level, the author was directed to interview an Emergency Planning officer. At county level, an interview with a Flood Risk officer was conducted and, at the regional level another Emergency Planner within the Emergency Services was interviewed. Interviews with development planners and with national level institutions were not successfully arranged.

Generally, when interviews were unsuccessful, reasons provided were either that the flood risk role was only marginal or that the questions were too wide-ranging to enable a single representative to offer answers with a level of confidence desired by the institution. The latter point was particularly made by the Environment Agency, who declined to take part in an interview because community resilience is a topic that runs across many of its operational departments and no single individual could address the diversity of the interview questions.

The interviews themselves were highly structured, lasting for approximately one hour and were divided into seven parts (see Appendix IV for details of interview structure and questions). The seven parts of the interviews included:

- A. **Questions about the interviewee** – length of service, duties, contact with previous role incumbents
- B. **Questions about the role undertaken by the interviewee** – changes to the role, influence on policy decisions, influence from policy decision
- C. **Questions about the organisation** – changes within the organisation, internal and external pressures on the organisation, openness to public scrutiny of the organisation
- D. **Engagement with the study communities** – significance of the presence of the organisation in the study communities, the extent of engagement with study communities, links to other institutions involved with flood risk management
- E. **The role incumbent's engagement in flood risk management** – extent of engagement with other organisations on flood risk management issues, control over resources, challenges to the role
- F. **The organisation's role in flood risk management** – the strength of inter-organisation links, accessibility of information held by organisation to communities, strength of ties to flood risk communities.
- G. **Dealings with groups within the study communities** – the ease of engaging with community groups, the benefits and challenges of engaging with community groups

### **3.5 Social network analysis and sociograms**

Most of the data gathered in this thesis was used to develop sociograms representing the various communities that were the focus of the study. Sociograms are a derivative of social network analysis and this section will provide an overview of social network analysis and the tools used in this thesis to create the sociograms.

#### **3.5.1 Integrating community resilience data using social network analysis**

Scott (2000) described social network analysis as a research technique, stemming from the outputs of three main research groupings, namely sociometric analysts, Harvard researchers and Manchester anthropologists. According to Scott, the

sociometric researchers developed the techniques for depicting complex social organisation as linked networks. The Harvard researchers dedicated much their efforts to the development of mathematics used to analyse networks and sociograms were one output from their research. The Manchester anthropologists focussed their efforts on using sociograms and social networks to interpret power structures and hierarchies within communities. Such research either focussed on the individual (ego-centric) or on the wider features of the network (global). Within these networks, the quality of relations was measured on the basis of reciprocity, intensity and durability of relations. The completeness of relations within the network was a measure of density and the ease with which actors could contact one another was a measure of centrality. For this research, social network analysis is a technique that provides a means of combining data gathered about all four key concepts that underpin this thesis (resilience, community, social institutions and social capital). The ability to combine the data gathered will ease the process of building a deeper understanding of community resilience and of the role played by CISC in enhancing community resilience.

According to Knoke (1990), important factors in social networks analysis include the roles and positions occupied by individual actors, as well as the relations or connections between these positions. Linkages between roles are defined as singular or multiple, strong or weak, frequent or infrequent and long or short in duration. The forms and contents of these linkages, or relations, between social positions had significant consequences for the formation of attitudes and behaviours. For this research, the work of Knoke (1990) was used to focus the analysis of collected data on the identifications of individuals, roles, institutions and links between individuals and institutions.

Both Marin and Mayntz (1991) and Kenis and Schneider (1991) used social network analysis to investigate policy networks. They described policy network research as the confluence of two research areas, namely: network analysis and policy making. That confluence of research areas freed researchers from being limited to the study of individual personalities, allowing them to analyse the collective actions of organized actors working within a system of inter-organizational relations. In their own research, Marin and Mayntz (1991) found that the complexity of a system has a direct correlation with the number of actors that can effectively operate within the system. They also found that links between actors were often asymmetric, building power structures within the network. The use of such networks had grown out of the dispersion of resources and capacity for action among public and private actors, a change that was noted by a shift from small and stable “iron triangles” to large and fluidly bounded issue networks (ibid). Marin and Mayntz (1991) provide an insight that is helpful for this research, revealing how social network analysis can be used to identify actors within the case study communities that are more or less effective and more or less powerful in dealing with flood risk issues.

### **3.5.2 Constructing the sociograms used in this thesis**

For this thesis, a tool from the Social Media Research Foundation called NodeXL was used to create the sociograms. NodeXL is an open-source template compatible with Microsoft Excel that enables social networks to be developed by entering data into an Excel spreadsheet (Smith *et al.* 2009).

NodeXL interprets data entered to identify vertices (nodes representing individuals or institutions) and edges (links between individuals or institutions). The software has a range of “force-directed” algorithms used to create different layouts of the social

network, but users can drag vertices around to refine the appearance of the network. In this thesis, networks were firstly analysed using the Fruchterman-Reingold algorithm. This initial layout was then manipulated by the author to emphasis the clusters arising from the analysis. The Fruchterman-Reingold algorithm is described by Kobourov (2012) as a form of “spring algorithm”, possessing a natural simplicity, elegance, and conceptual intuitiveness. The algorithm creates aesthetically pleasing layouts governed by two main criteria: “all the edge lengths ought to be the same, and the layout should display as much symmetry as possible” (p385).

Within the software, it is possible to tailor the colour, shape and size of vertices and edges. This feature was used to help highlight cliques and individuals of importance within the separate sociograms. The software is also capable of calculating a range of metrics within the network, including degree, centrality, closeness, rank, density and more. For this research, degree (measure of connections) and rank were used to identify individuals and institutions with elevated status within the communities studied.

### **3.6 Reflexivity and positionality**

In common with accepted traditions in geography, the author was mindful of the need to be reflexive in relation to his position as a researcher (Cook and Crang 1995, Flowerdew and Martin 1997, May 2001). Reflexivity is described as a self-critical introspection of the self as the researcher, which can lead to insights and new hypotheses about the research question (Cook and Crang 1995). To be effective, the critical reflexive introspection needs to disentangle how the researcher’s position might shape the empirical analysis of data gathered, or shape the interaction with research participants (May 2001). In relation to the former point, the researcher

must be mindful of the fact that gender, age, ethnicity and personal experience can shape an individual's interpretations of the world. In relation to the latter point, the power relationship between the researcher and the research participant can impact on the data gathering process.

Being mindful of positionality and reflexive provides the researcher with opportunities to assess situations and adapt an approach if the objectives of the research are being compromised (Flowerdew and Martin 1997). In this study the pilot questionnaire survey of community based respondents provided a good opportunity for the author to reflect on the research approach and to identify issues to do with positionality. Prior to commencing the pilot study the author was aware that his powerful position in the research process had the potential to influence responses to survey questions. To mitigate the potential for bias, questions were drafted in a form that made it difficult for respondents to provide answers that they thought the researcher "would like to hear". Questions were formatted to provide quantitative "yes" or "no" responses, and when giving an affirmative response respondents were asked to provide a qualitative explanation to support their answers. In some cases this led to further re-affirmation of the response, but in other cases the lack of a qualitative rationale to support the answer weakened the case to support the respondent's answers.

At the commencement of the pilot study, the author believed that it would be necessary to sit with respondents when completing the questionnaire. However, it became clear that in such a situation the presence of the researcher made respondents uncomfortable. The discomfort arose when respondents were forced by the questions to admit to their ignorance of certain aspects to do with flood risk

management in their local community. In such circumstances the respondents sought to engage the researcher in conversation about the topic in an attempt to guess what answer the researcher was looking for. When respondents were left to complete the questionnaire on their own they were slower in responding, but were quite capable of completing the questions without the researcher in attendance. For the main survey the approach adopted was to leave the questionnaires with respondents. On reflection the modified approach was beneficial to both parties. The respondents were under less pressure to answer “correctly” and were more likely answer “honestly”. By not directly supervising the completion of the questionnaire, the author avoided sub-consciously “leading” the respondents.

When it came to interviewing people involved in flood risk management, the author’s history of experience in the field of disaster management research was often utilised to rebalance the power distribution in interviews. That rebalancing was only required where interviewees were flood risk management professionals, often with considerable experience themselves in their respective role. In those circumstances much of the conversation preceding the interview was focussed on establishing the credentials of the researcher, giving the interviewee confidence that technical and political nuances in conversations would be understood and could be addressed in depth. Where interviewees were less knowledgeable about flood risk management issues, the power relationships were reversed and the researcher was mindful not to undermine the confidence of the interviewee.

### **3.7 Conclusion**

In this chapter, the rationale supporting the approach adopted for the collection and analysis of the data needed to achieve the aim and objective of this thesis has been

set out. The approach was first described within the context of following a tradition of geography research. Whilst drawing on many traditions in Geography research, the approach in this thesis was described as following largely in the tradition of a post-structuralist methodology.

Central to the research approach adopted in this thesis was the case study method. Case studies were described as providing a combination of depth and diversity that fit well with the broad aim of the thesis. In its application, the case study method was contextualised using a flood risk scenario. Flood risk management was explored in depth to help explain how it was able to provide a degree of complexity well suited to challenge inherent in building an understanding of resilience at the community level. To provide some scope for creating generalisation from the data gathered, and to overcome some of the shortcomings of case study research, multiple flood risk communities were selected for investigation. When selecting the flood risk communities, the Teign Estuary was identified as a place where three communities could be found that share exposure to a common hazard, namely tidal and storm surge flooding. The three communities (Newton Abbot, Teignmouth and Shaldon) had long histories, histories that included flood events, and two of the communities showed evidence of community-based action to address the local flood risk.

The methodology developed for this thesis was applied using a variety of data collection techniques, including document analysis, observation, questionnaires and interviews. The document analysis technique was helpful in identifying institutions in the FRM framework and was effective in identifying links between institutions. The observation study was successful in two ways. First, the observation study helped to define the boundaries of the case study communities, which were not always clear in

published flood risk maps. Second, the observation data identified evidence of actions to address flood risk in the study areas. After modifications were made to the main survey questionnaire (based on lessons learned from the pilot study), the questionnaire worked well, with a good completion rate. Interviews were the least successful method deployed, as the author only succeeded in securing interviews with 50 percent of the intended interview sample. The impact of the deficit in interview data was limited by the ability to cross-reference views expressed by interviewees with documentary data, and data from the questionnaire survey.

The use of the NodeXL software to translate data gathered into sociograms of the case study communities was very effective. When trying to highlight important areas within the data collected, the software tool was easy to use and graphics were easy to manipulate. As a consequence, the sociograms produced were useful in illustrating links between social capital and community resilience.

## **Chapter 4. FRM and community based social institutions**

## 4.1 Introduction

In Chapter 2, the author reviewed current thinking about institutions and highlighted a number of important issues which could have an influence over the level of resilience achieved by a community. In this chapter those issues will be further investigated. The investigation is split into two parts, the first part is highly descriptive and the second part includes an analysis of issues arising from the literature review.

The first part of the investigation is set out in sections 4.2 and 4.3. In section 4.2 data from the questionnaire survey is used to describe community and sub-community level institutions in each of the three case study areas: Newton Abbot, Teignmouth and Shaldon. The narrative in section 4.3, uses data from the analysis of policy documents (see appendix I) to identify a framework of institutions involved in flood risk management (FRM) and the level at which they operate. The description of the FRM framework divides the institutions into five operational levels; national, regional, county, district and local. As the description descends from the national to the local level, the identification of institutions is increasingly biased towards those with links to the three case study areas.

Sections 4.4, 4.5 and 4.5 provide the detailed analysis of issues arising from the review of the academic literature relating to social institutions. Specifically, section 4.4 explores the relevance to this study of the themes of institutionalisation and institutional openness (Berger and Luckmann 1966, Hassard 1993, Hay 2004, Lopez and Scott 2000, Pelikan 2003). Section 4.5 explores the significance of some specific claims by Brinton and Nee (1998) and Hodgson (1998) relating to status, power, coercion and resistance acting both internally and externally on social institutions. The final section, section 4.6, examines the FRM institutional network to

reveal patterns of behaviour associated with the operation of policy networks (Ensiminger 1998, Marin and Mayntz 1991, Silva 2007, Scott and Meyer 1994).

## **4.2 Community and sub-community level institutions**

### **4.2.1 Section outline**

This section will begin the investigation of the three case study communities. To commence the investigation, details of local government institutions immediately surrounding the communities is first presented. Data presented will be used to build a deeper understanding of institutions that may play some part in the management of the local flood risk, which will be developed further as this chapter progresses.

Having identified important local institutions that surround the communities, the investigation then presents data, gathered from the community questionnaire survey, about sub-community level institutions. In addition, the survey data is used to reveal sub-community level organisations with an active or historic role in the management of flood risk.

### **4.2.2 The Newton Abbot flood risk community (NA)**

The Newton Abbot case study community was defined by the extent of the 1 in 100 year tidal flood risk area (Halcrow 2009). For Newton Abbot, three potential case study areas were identified (Figure 4.1).

An observational visit to the three potential case study areas showed that Areas 1 and 2 were dominated by industrial units and Area 3 had a combination of residential, industrial and retail units. Area 3 was judged to provide a sample population similar in size and characteristics to the other two case study sites (see images from

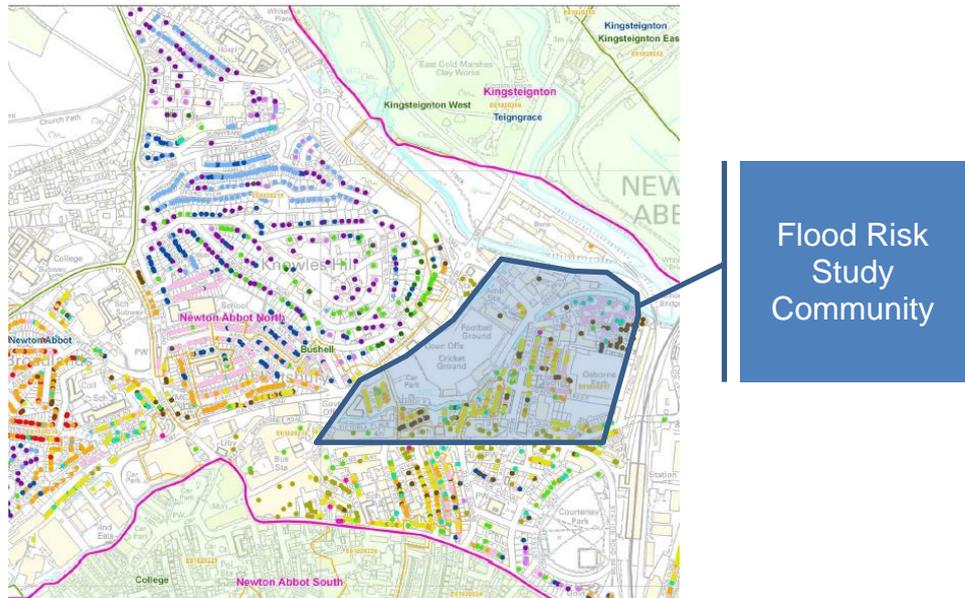
observational visit in Appendix II). Hence, Area 3 was chosen as the area in which to conduct further research for this thesis.



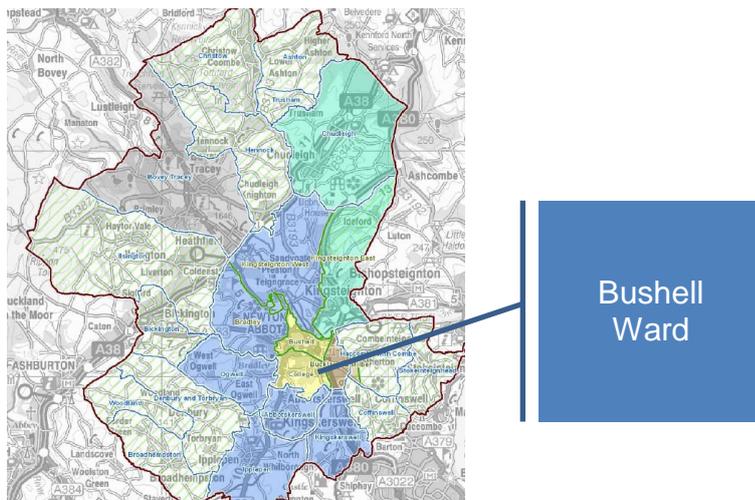
**Figure 4.1 Newton Abbot and Kingsteignton Flood Risk Map**

(Adapted from: Halcrow 2009)

**Bushell Ward (BW)** – The Newton Abbot case study community is nested into the Bushell Ward within the Newton Abbot Town area (Figure 4.2 & 4.3). Within Bushell, there are 3057 households, more than 30% are classed as close-knit urban households and 11% are low income older people (DCC 2004 & 2012). In the 13<sup>th</sup> century, Newton Bushell was a separate entity from Newton Abbot (Fieldon Clegg Bradley Studios 2009).



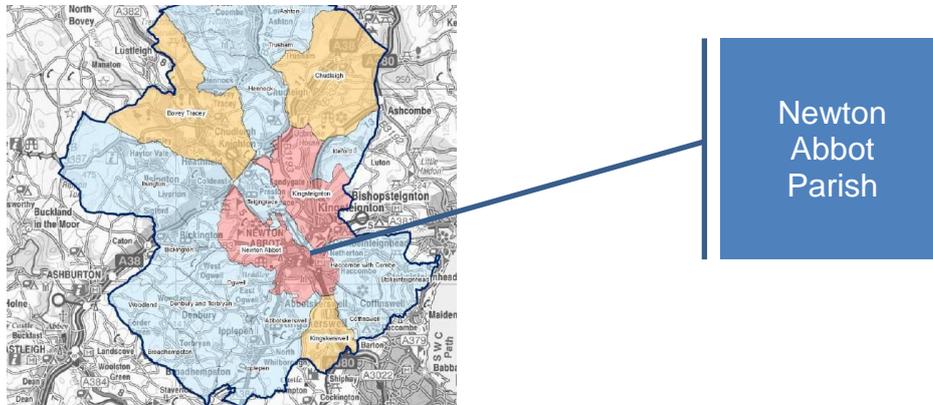
**Figure 4.2: Newton Abbot Bushell Ward**  
(Source: DCC 2012)



**Figure 4.3: Wards in the Newton Abbot and Kingsteignton "Devon Town" Area**  
(Source: DCC 2009)

**Newton Abbot Town Council (NATC)** – Bushell Ward falls within the area covered by Newton Abbot Town Council, which itself is defined by the limits of the Parish boundary (Figure 4.4). Administratively, the town is sometimes clustered together

with Kingsteignton in what is called a “Devon Town” area (DCC 2006 & 2009), but this clustering appears to have no formalised structure.



**Figure 4.4: Parishes in the Newton Abbot and Kingsteignton “Devon Town Area”**

**(Source: DCC 2009)**

For the author, there appeared to be a mismatch between ward, parish and town boundaries, which had the consequence of blurring the limits of responsibility for some aspects of local governance in Newton Abbot. From a flood risk management perspective, the Town Council has historically had little or no involvement (Interview 01). However, as a consequence of both the Pitt Review (2009) and the Localism Policy being developed by the UK government (HMG 2011), the NATC was under pressure to get involved with the development of emergency plans for flood events (Interview 01).

#### **4.2.3 The Teignmouth flood risk community (TM)**

The Teignmouth case study community was identified in the same manner as the Newton Abbot case study community. In Teignmouth, there was only one clear area at risk from tidal flooding (Figure 4.5). The case study area in Teignmouth encompassed the main retail area of the town as well as numerous residential and

industrial areas. **Teignmouth East Ward (TEW)** – The flood risk community in Teignmouth sits within the Teignmouth East Ward (Figure 4.5). The author could find no reference to the Ward having any role in the administration of the local flood risk.

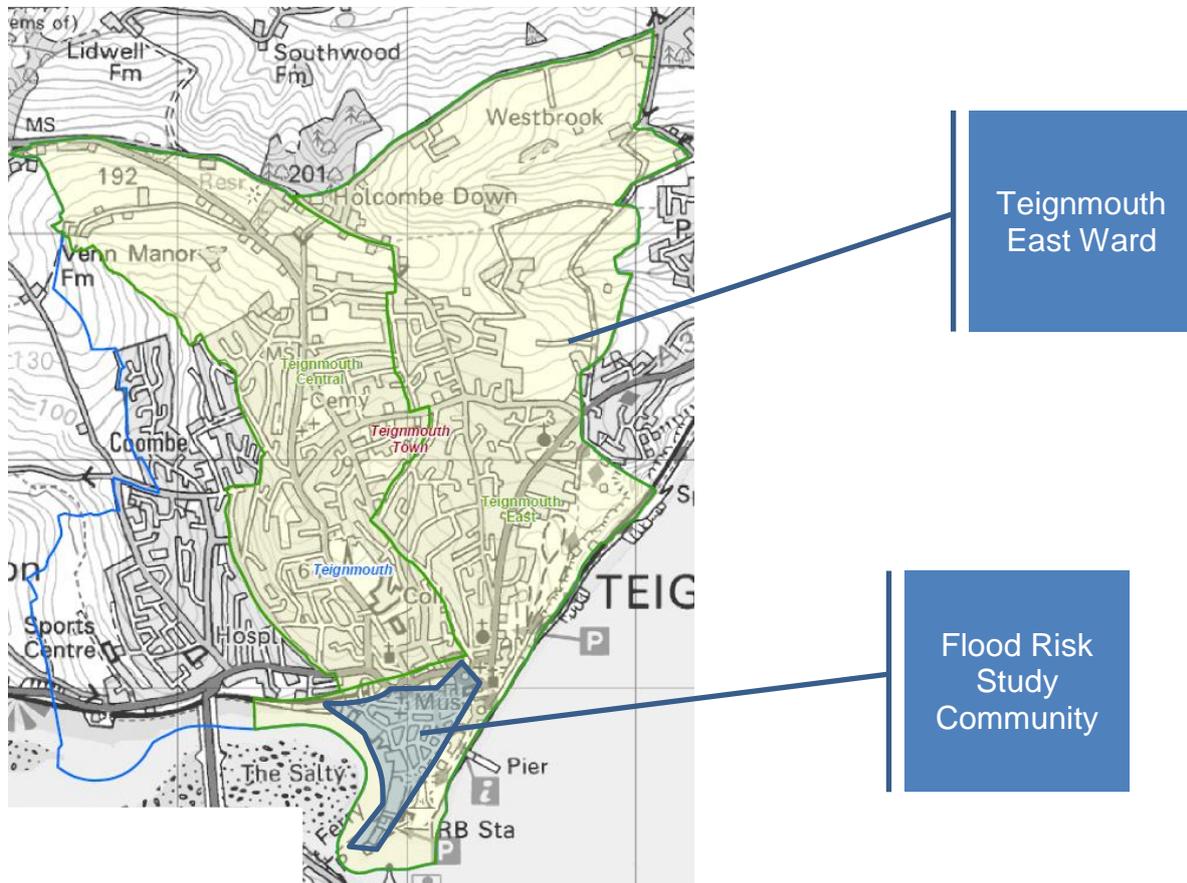


Figure 4.5: Wards in the Teignmouth Town Area

(Source: ONS 2011)

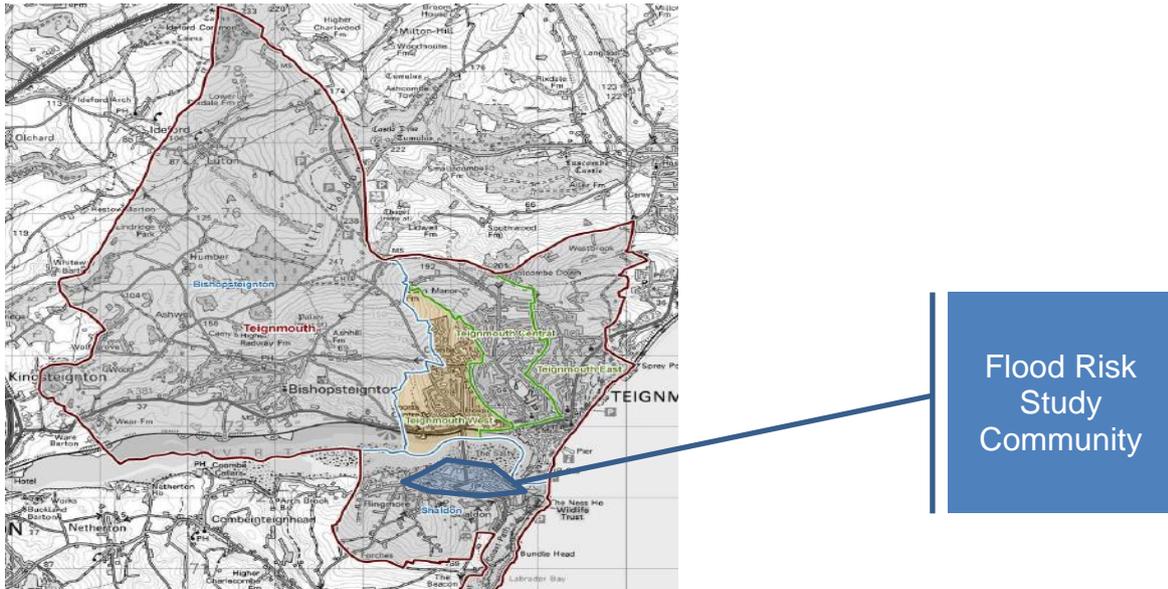
**Teignmouth Town Council (TCC)** – Teignmouth Town comprises three wards (West, Central and East). For planning purposes, Teignmouth town is often clustered into an area that includes Shaldon, Bishopsteignton and Stokeinteignton (TRP 2005). Historically, the Town Council has not played any significant role in planning for flood events, but there has been strong pressure over several years for it to take a more proactive stance in relation to flood related problems in the town (ibid). In November 2011, the author was invited to observe the inaugural meeting, held between the

Town Council and the District Emergency Planner to initiate work on an emergency plan for the town (Interview 01).

#### **4.2.4 Shaldon flood risk community (SH)**

As with Teignmouth and Newton Abbot, the Shaldon case study area was defined by limits of the 1 in 100years tidal flood risk (Halcrow 2009). As with Teignmouth, one area in Shaldon encapsulated most of the community at risk from flooding (Figure 4.6). The case study community in Shaldon comprised mainly residential areas with some retail area.

**Shaldon Parish Council (SPC)** – Shaldon Parish Council is interesting for this research based on two specific findings. First, the Parish Council is distinctly different from Newton Abbot and Teignmouth in that it operates as a sub-unit of a larger ward that comprises both Shaldon and Stokeinteignton (ONS 2011). Second, the Parish Council has an established record of engagement with flood risk issues (Interview 02). For planning purposes, Shaldon is generally grouped with Teignmouth and Bishopsteignton (Figure 4.6). In relation to flood risk planning, the Parish Council set up a working committee to liaise with the EA on flood related issues (Interview 02).



**Figure 4.6: Shaldon Parish Area**

(Source: DCC 2010)

**Shaldon and Stokeinteignton Ward (S&SW)** – The Shaldon and Stokeinteignton ward does not figure strongly in any planning or flood related records.

#### **4.2.5 Case study area sub-community analysis**

The questionnaire survey asked respondents to identify groups within their community. The survey also asked respondents to identify any roles within the groups created to deal with flood risk issues. Each sub-group was ranked based on the frequency that it was mentioned by the entire community sample.

The Newton Abbot respondents identified 34 separate groups with various levels of institutional organisation (Table 4.1). In Newton Abbot, respondents did not identify any specific flood risk group, or roles within established groups with a focus on flood risk management.

**Table 4.1: Groups within the Newton Abbot Flood Risk Community**

(Source: Author)

1	Churches	18	Twinning assoc
2	Tennis	19	Squash
3	Leisure/sports centre	20	Dance
4	Football	21	Natilonal trust
5	Sports	22	Cadets
6	Cricket	23	Drop in centre
7	British Legion	24	TA
8	Scouts	25	Rowing club
9	Schools	26	Rotary
10	Community Centre	27	Karate
11	Rugby	28	Surgery
12	Childern centre	29	Ukelele group
13	Community groups	30	Sailing club
14	Gym	31	Swimming
15	Chess	32	Flyers
16	Brownies and beavers	33	Traders group
17	Help the aged	34	Trampoline

In Teignmouth, the questionnaire survey identified 48 groups, including one group with a flood management role (Table 4.2). The flood risk group was sometimes referred to as “the flooding group”, but its official name was the “Back Beach Committee”. In terms of its overall ranking in the community, the flood group scored quite low (37 out of 48).

**Table 4.2: Groups within the Teignmouth Flood Risk Community**

(Source: Author)

1	Churches	25	The pulse
2	Rugby	26	Art
3	Alice Cross	27	Bridge
4	Football	28	Politics
5	Leisure/sports centre	29	Swimming
6	Youth club	30	Ice Factory
7	Rowing club	31	Teign estuary transition
8	Rotary	32	Squash
9	Sailing club	33	Oxfam
10	Cadets	34	Skateboard
11	Theatre	35	Surfing
12	Traders Ass	36	Badminton
13	Sports	37	Flooding/Back Beach
14	East cliff	38	OAP
15	Cricket	39	Gardening
16	RNLI	40	Angling
17	Music	41	British Legion
18	Carnival	42	Film club
19	Darts	43	Science soc
20	Diving	44	Choir
21	Museum	45	Regatta
22	Probus	46	Teign Heritage
23	Red rock	47	Lifesaving
24	TAAG	48	Bowls

Flooding  
Role

In Shaldon, the questionnaire survey revealed 42 groups (Table 4.3). No group with a role in flood risk management was identified, but further questioning revealed that a “Flood Defence Working Party” had existed in the recent history of the community and a new group flood group was in the process of creation. The possible reason that the general survey respondents did not including the groups in the original list is that the groups were both sub-groups of the Parish Council. The Flood Defence Working Party had been active in the lead up to the implementation of a new flood defence scheme. Now that the flood defence scheme has been completed the role,

function and membership of the group was changing (Interview 02). A new group was being created, which included flood wardens, and its role will be to liaise directly with the EA when a flood warning is issued. The main function of the new group is to close and open flood gates that protect the village (Interview 02). Both flood groups possessed a highly institutionalised structure, with clear rules and procedures that regulated their operation.

**Table 4.3: Groups within the Shaldon Flood Risk Community**

(Source: Author)

1	Over 60s club	23	Choir
2	Bridge	24	Gardening
3	Bowls	25	Charities
4	Regatta	26	Rotary
5	Churches	27	Sports
6	Scouts	28	RAF
7	Football	29	Brownies and beavers
8	Rowing club	30	Tourist Assoc.
9	Sailing club	31	Teignmouth players
10	WI	32	Youth club
11	Carnival	33	Music
12	Botanical Garden Soc.	34	Snooker
13	Politics	35	Art
14	British Legion	36	Wildlife trust
15	Horticultural Soc.	37	Fishing
16	1785 Committee	38	Friday club
17	Schools	39	Investment club
18	Local Council	40	Shaldon Grasshoppers
19	Theatre	41	Gym
20	Festival	42	Book club
21	Golf	43	Cycling
22	Cricket	44	RNLI

#### 4.2.6 Lessons learned

In this section, a number of institutions operating within or immediately surrounding the case study communities have been identified. Immediately surrounding the case

study communities are organisational structures in the form of wards, a parish council and two town councils. These structures merge to form a layer of administration with direct links to the case study communities. At the start of this research, only one of these administrative areas (Shaldon) demonstrated any active engagement in flood risk management. Over the course of this research (2008-2013), the author did witness an inaugural meeting between the Teignmouth administration and a representative from the District Council to discuss Flood Risk planning and by the time this research project finished (2012) the Teignmouth authorities had enacted a flood risk management programme (Teignmouth flood project was not included in this research).

Within the case study communities themselves, evidence was found of local organisation to address flood issues in Teignmouth and Shaldon. In Teignmouth, a group had been formed but had not achieved any distinct results. In Shaldon a working party had been created by the Parish council, had achieved a result and was in the process of being remodelled to address residual flood risk management issues. Other than these groups, no other sub-groups in the communities had any obvious role in local flood risk management issues.

From this preliminary analysis, a snapshot emerges of a point in time where one community has not clearly acknowledged the threat posed by flooding to the community (Newton Abbot); one community has a growing awareness of the flood risk (Teignmouth); and one community where the flood risk has been recognised and the community has taken action to address the threat (Shaldon). From these foundations, the investigation will move forward to consider how that foundation

impacts on the ability of institutions and the communities to work together to improve overall community resilience.

### **4.3 The Flood Risk Management (FRM) Framework**

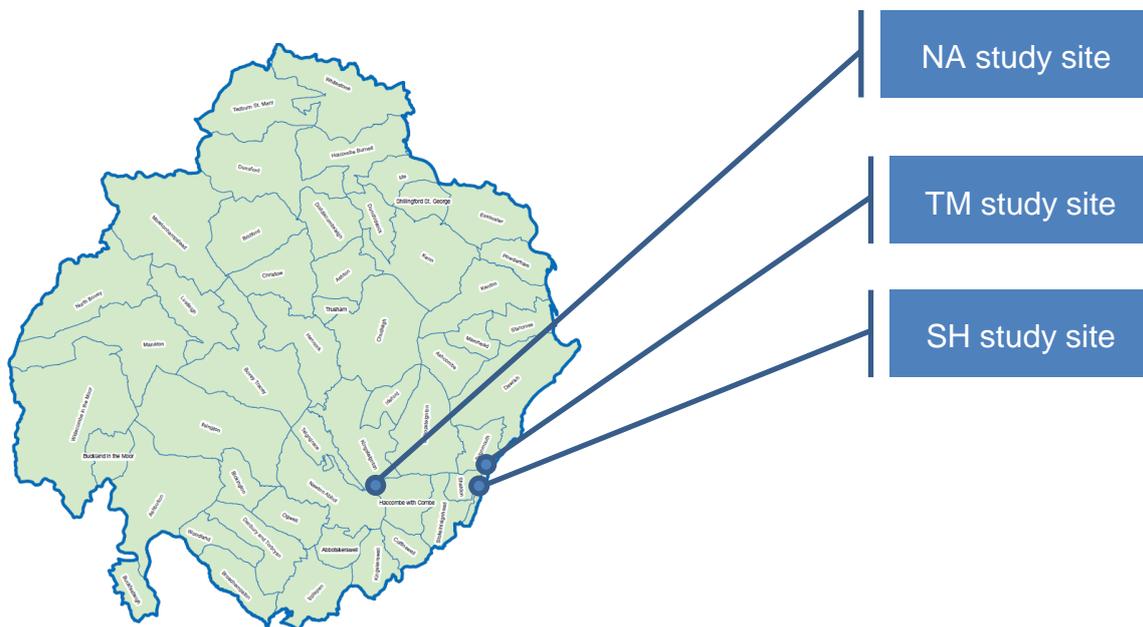
#### **4.3.1 Section outline**

In this section, the results of the policy document analysis and institutional interviews are presented. The analysis is used to reveal the institutions that make up the Flood Risk Management (FRM) Framework in the UK. Institutions revealed are presented within clusters at the district, county, region and national level. In addition, brief mention is made of institutions from the international level.

#### **4.3.2 District level institutions**

**Teignbridge District Council (TDC)** – The district council is a very different organisation to either of the town councils and the parish council previously reviewed. At the town and parish level, resources are severely limited, but by comparison, the district is well funded and has several specialist staff and departments (Interviews 01, 02 and 03). Importantly for this research, the district council has been the main centre for flood risk management in South Devon for several decades (Interview 01). Within TDC, the emergency planning function is embedded within the drainage and coastal team (ibid). Prior to 2004, when the current system for emergency planning was introduced, the drainage and coastal team dealt with flood related issues. Historically, the district has strong links with the local councils and the local study communities. As part of this research, TDC is important, not just for its flood risk management role, but because all three study sites sit within its administrative area (Figure 4.7)

**Newton Abbot and Kingsteignton Devon Town (NKDT)** – The NKDT was mentioned in Section 4.2, but it operates more as a district level organisational entity as it operates across several parish boundaries (DCC 2009). The classification of a “Devon Town” seems to have little administrative recognition outside of the county council. There is also no evidence of any part played by Devon Towns in flood risk management. As a district, the Newton Abbot and Kingsteignton Devon Town only includes the NA study site.



**Figure 4.7: Parishes in the Teignbridge District Area with study site locations indicated**

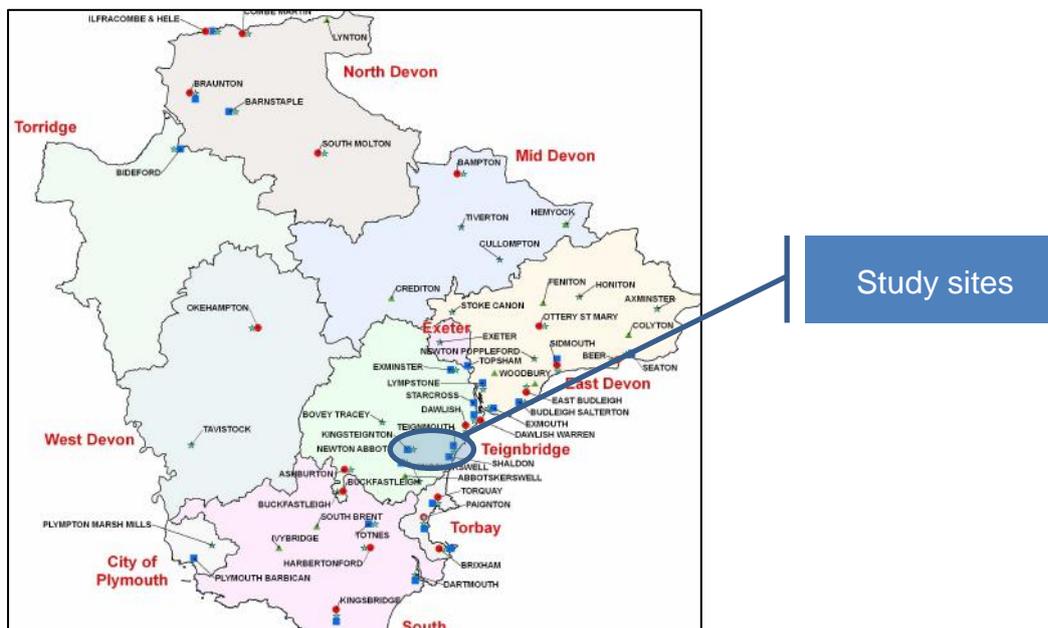
(Source: DCC 2007)

### 4.3.3 The County level institution

**Devon County Council (DCC)** – County level organisations relevant to the case study areas are limited to DCC. Research for this project has revealed that the County Council plays an important role in flood risk management, but this role is currently changing. The county has strong links to districts and to regional level

organisations where much of the planning relating to flood risk has been undertaken. However, in 2010, the county level authorities were given new responsibilities, which in Devon had traditionally been held by the districts (DCC 2009).

The county has recently set up a flood risk team and some personnel from district level are transferring to county level (Interview 01 and 04). Within the county, there are 150 communities at risk from flooding (Figure 4.8).



**Figure 4.8: Districts and Flood Risk Areas in Devon County with study site location**  
(Source: DCC 2009)

#### 4.3.4 Regional level institutions

Responses from the questionnaire survey were not very successful in identifying regional level organisations involved in flood risk management, but interviews conducted for this research as well as the document analysis identified a number of organisations with an input to flood risk management at the regional level. At the

regional level, documentation with a specific focus on flood risk management became much more evident. Regional level documents analysed for this research included: Catchment Flood Management Plans, Regional Flood Risk Appraisals, Regional Spatial Strategies and Shoreline Management plans amongst others. In total, twenty institutional entities were identified as operating at the regional level, but an important distinction also became clear. Namely, some national level organisations operate mainly at regional level, i.e. utility companies are national level operators, but their input into flood risk management is only evident at the regional level.

The entry points to the identification of regional level organisations were interviews 03 & 05. What both interviews revealed was that the boundary of this level was not always clear and that entities operating at this level have different boundaries. In addition, public sector entities at the regional level underwent significant change in 2010-2011. Specifically, several coordinating bodies like the Regional Development Agency, the Regional Government Body and Regional Resilience and Emergency Departments ceased to exist just prior to this research commencing. All of these bodies had roles within the community of institutions dealing with flood risk and the changes have meant that other institutions have had to take on new responsibilities. In particular and at regional level specifically, the Local Resilience Forum has become the main point of focus for the development and coordination of civil contingency planning for floods in the South West Region.

In the questionnaire survey, respondents were asked to identify organisations with a role created specifically to deal with flood risk issues. When cross-referenced against data gathered from interviews and the document analysis, only one group of

organisations was identified as regional level institutions, namely emergency services. Three specific emergency services were identified with a role in relation to flood risk management (Table 4.4).

**Table 4.4 Regional level emergency services in the South West of England identified in FRM policy documents**

(Source: Author)

Individual regional emergency service entities	Acronym
Devon and Cornwall Constabulary	D&CC
Devon and Somerset Fire and Rescue Service	DSFRS
South West Ambulance Service	SWAS

The involvement of regional emergency services in flood risk management was mainly in relation to emergency planning. An emergency planner working with one of the emergency services in the South West of England was interviewed for this research (Interview 05) and he was able to identify additional organisations and policy documents where further organisations could be identified (Table 4.5). A second emergency planner was also interviewed, who was an active member of the member of a regional planning committee (Interview 01).

**Table 4.5 Institutions involved in FRM at Regional Level in South West England**

(Source: Author)

Collective regional entities involving emergency services	Acronym
National Parks Authority	NPA
Government Office for the South West ( <b>abolished</b> )	<del>SWG0</del>
Local/Regional Resilience Forum for the South West of England	SWLRF
South West River Basin Liaison Panel/ Advisory Committee	SWRBLP
South West Regional Development Agency ( <b>abolished</b> )	<del>SWRDA</del>
Regional Flood Defence Committee for the South West of England	SWRFDC
NHS South of England/ South West Strategic Health Authority	SWSHA
South West Water	SWW

From the policy documents reviewed, it was clear that utility companies start to play a part in flood defence planning at regional level. Of the utility companies, only the water company was truly based in the South West region. Other companies were more nationally based and, as such, are referred to generically by the nature of the service they provide (Table 4.6).

**Table 4.6 Utility companies identified in policy documents with an input to FRM at Regional Level in South West England**

(Source: Author)

Utility company	Acronym
Electricity	Elec
Gas	Gas
Railway Operators	Rail
Telecoms	Telecom

In addition to utility companies, regional policy documents revealed a number other national entities with inputs to regional level flood risk management plans (Table 4.7)

**Table 4.7 National level institutions identified by policy documents as operating at Regional Level on FRM issues in South West England**

(Source: Author)

National Level Entity	Acronym
Ministry of Defence	MoD
Government Decontamination Service	GDS
Maritime and Coastguard Agency	MCA
Animal Health and Veterinary Laboratories Agency	AHVLA

Finally, and with the potential to link directly into communities, regional flood risk planning bodies include representatives of the voluntary sector in their panels. For the South West region, the local voluntary sector is represented by:

British Red Cross (BRC)

#### **4.3.5 National level institutions**

To identify UK national level entities the most comprehensive source of reliable data was gathered from policy documents related to flood risk management. In total, twenty-five national level policy documents were reviewed, mainly drawn from national government sources, and a total of forty nine different entities were identified. The first five entities were government bodies responsible for publishing most of the source material reviewed for this section (Table 4.8).

**Table 4.8 National Level institutions involved in FRM based on authorship of key policy documents**

(Source: Author)

Full Name	Acronym	Comment
Her Majesty's Government	HMG	Author of numerous statutes and regulations relating to flood risk Author of 12 documents reviewed
Department of Environment, Food and Rural Affairs	DEFRA	Main department within HMG with responsibility for flood risk management policies Author of 7 documents reviewed
Office of the Deputy Prime Minister ( <b>abolished</b> )	<del>ODPM</del>	Department with responsibility for building regulations Author of 2 documents reviewed
Department of Communities and Local Government	DCLG	Department with responsibility for planning policy Author of 1 document reviewed
Department for Transport	DfT	Department with responsibility for road and transport policy Author of 1 document reviewed

Two other high level organisations were also identified by virtue of publishing reports relevant to flood risk management in the UK and which were reviewed for this thesis (appendix I):

Highways Agency (HA)  
Environment, Food and Rural Affairs Committee (EFRAC)

Documents produced by the seven entities identified above revealed links to an additional thirty-seven organisations involved in UK flood risk management and operating at national level (Table 4.9).

**Table 4.9 National entities involved in UK flood risk management identified from policy documents**

(Source: Author)

Full Name	Acronym	Full Name	Acronym
Association of British Insurers	ABI	HM treasury	HMT
Association of Drainage Authorities	ADA	Health Protection Agency	HPA
British Geological Survey	BGS	Health and Safety Executive	HSE
Building Research Establishment	BRE	Institution of Civil Engineers	ICE
British Standards Institute	BSI	Institution of Highways and Transportation	IHT
British waterways	BW	Local Government Association	LGA
Commission for Architecture and the Built Env	CABE	Met Office	MO
Countryside Commission	CC	Nature Conservancy Council for England	NCCE
Chartered Institute of Building	CIOB	Natural England, English Nature, Countryside Agency	NE
CIRIA	CIRIA	National Flood Forum	NFF
Country Land & Business Association	CLBA	National Farmers Union	NFU
CoastNet	CN	National Home Builders Council	NHBC
Department for International Development	DFID	National Health Service	NHS
Environment Agency, National Rivers Authority	EA	National Voice of Coastal Communities	NVCC
English Heritage	EH	OFWAT	OFWAT
Forestry Commission	FC	Royal Institute of Chartered Surveyors	RICS
Flood Management Stakeholders Forum	FMSF	UK Climate Impacts Programme	UKCIP
Flood Products Association	FPA	HR Wallingford	WALL
Climate Change Communications Working Group	FUTERRA		

At this stage in the thesis, it would be useful to provide some explanation of the nature of involvement that these entities have in relation to UK flood risk management. The document analysis revealed that entities are drawn into flood risk management from three main pathways: civil contingency planning, development planning and environmental planning. The entities themselves may be categorised in four ways: government bodies, those with delegated responsibility for flood risk management, those acting in an advisory or supporting capacity and special interest groups (see section 4.6 for more detailed analysis).

### 4.3.6 International level institutions

At numerous points throughout this thesis, reference has been made to organisational entities that operate at international level, but which also have influence over how flood risk is managed in the UK. It is beyond the scope of this thesis to explore in detail the framework of international organisations working on flood risk issues, rather data for this section is derived from references made from within the UK system for flood risk management to organisations operating beyond UK borders. The intention here is to simply indicate which international organisations have some influence over UK flood risk management. Nearly all the references to international organisations come from documents analysed at national level. The references identify two main international entities, namely:

United Nations Organisation	(UN)
European Union	(EU)

The UK flood risk management system makes reference to the United Nations within the context of three key outputs the UN has produced. First, the UN 1992 “Framework Convention on Climate Change” is referenced in the UK Government “Sustainable Development Strategy: Securing the Future” (DEFRA 2005a). Second, the UN 1997 “Kyoto Protocol” is also referenced by the DEFRA (2005a) strategy, but also by another DEFRA policy document called “Delivering the essentials of life” (2004). Finally the UN 2000 “Millennium Development Goals” are referenced in the DEFRA 2005a report. The European Union influence on UK flood risk management is more direct and comes from two main sources. The EU 2000 “Water Framework Directive” has links to three important flood risk planning documents: “Making Space for Water” (DEFRA 2005b), “Planning Policy Statement 25: Development and Flood

Risk” (DCLG 2006) and the “Design Manual for Roads and Bridges, HD45/09” (HA 2009).

#### **4.3.7 Lessons learned**

The research above can be merged with data from section 4.2 to create a diagram showing how FRM institutions are nested into a series of overlapping layers with increasingly greater geographical spread. It is also possible to indicate where boundaries to the layers are clear (solid line) or less clear (broken line). Figure 4.9 below shows this layering in the flood risk management framework for dealing with floods in the case study communities.

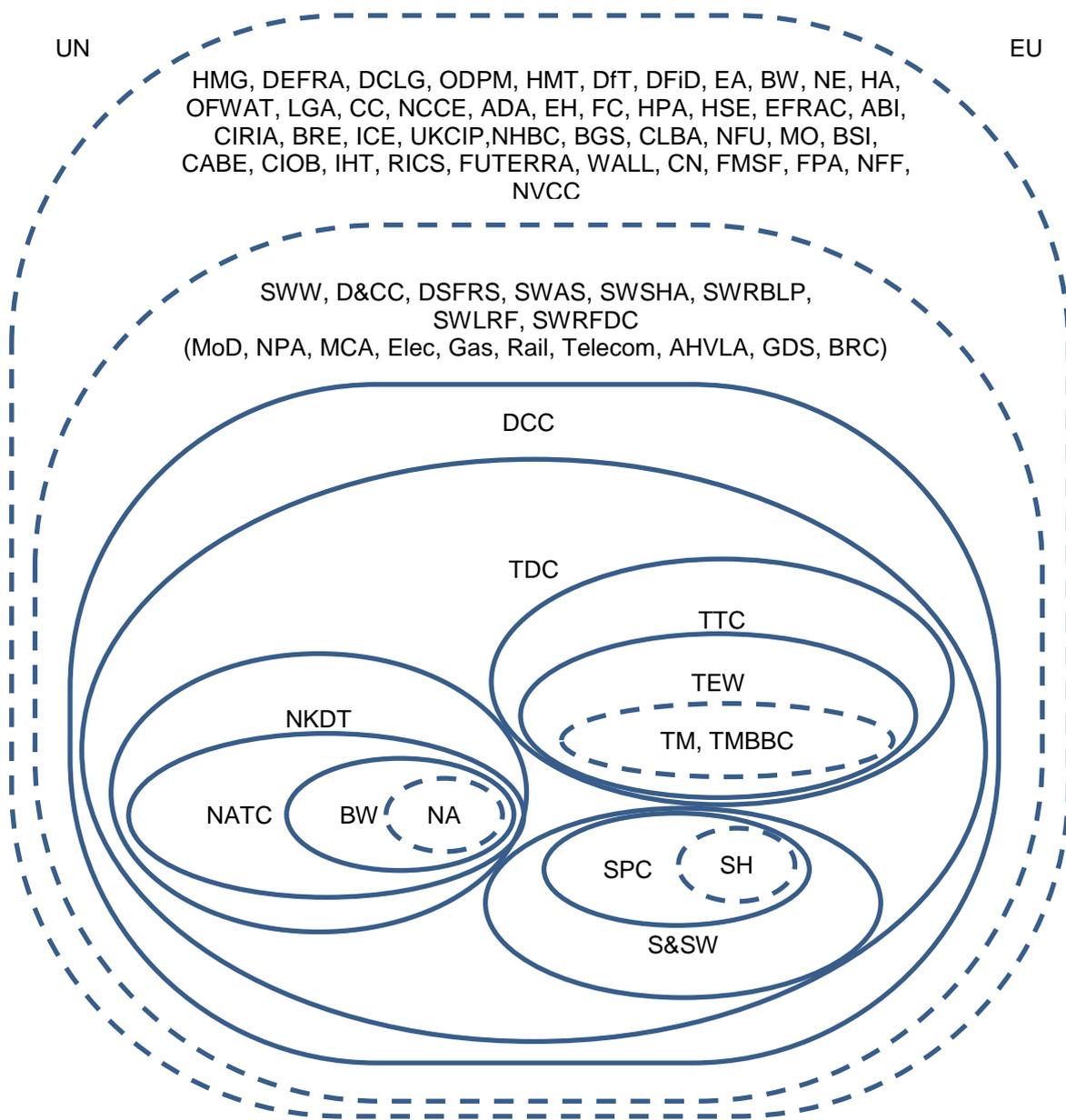


Figure 4.9 The FRM institutional framework for the Teign Estuary, South Devon

(Source: Author)

## 4.4 Institutionalisation and institutional openness

### 4.4.1 Section outline

In this section, two themes identified in the academic literature are explored in more detail. First, is the claim made by Berger & Luckmann (1966) that roles can be institutions in their own right, but to qualify as institutional objects, they must have undergone a process of institutionalisation. That claim is still accepted by more modern researchers (Hodgson 1988, Lopez & Scott 2000, Pelikan 2003, Hay 2004) and suggests that this thesis must assess if the distinction between institutionalised roles and non-institutionalised roles is important for the creation and maintenance of community resilience.

The second theme to be explored, relates to the claim by Hassard (1993), that organisations have closed, partially open and open structures. To Hassard, the openness of an institution defines how it interacts with the external world:

**Closed organisational system** - introverted, self-sufficient, focus on internal processes and variables that were unaffected by external environmental factors.

**Partially open organisational system** - recognises a limited range of external variables as having an influence over the actions of the organisation, but their use is limited to plugging holes in understanding their internal operating environment.

**Open organisational system** - demonstrates a dynamic relationship between internal and external environments, adapting internal process to external inputs in order to achieve a balanced equilibrium.

Hassard's claim has been somewhat neglected by modern researchers, but is deserving of greater scrutiny in this thesis, because this research aims to promote

development of community resilience by encouraging links between communities and institutions. As such, the openness of an institution is an important trait to assess and Hassard's description provides a useful framework for undertaking that assessment.

#### **4.4.2 Institutionalisation of roles in the flood risk management framework**

As part of the questionnaire survey, respondents were asked to identify formal roles that they have occupied in any of the social networks of which they were a member (Q23 & 31). These roles were distinguished from simple membership of a community group (Q27). When examining the responses, it was evident that respondents engaged in a variety of community based institutions, but most significant of these were clubs and societies (24% of sample). Where the institution itself was highly institutionalised, engagement was in a formal manner. Where institutions were less institutionalised, the level of institutionalised engagement ranged from 33-51% (see Table 4.7). Overall, 31% of the survey population had occupied a formal role in a local institution, compared to 43% who had informal role as members.

Questionnaire respondents were also asked to identify if any of the social networks, community groups and community based businesses had a role created specifically to deal with flooding issues (Q24, 28 & 32). Affirmative responses to these questions were very low, ranging from 8-15% of the case study samples (Table 4.8). Even the top ranked group, the local flood risk group, was only identified by eight respondents (5% of the sample population).

**Table 4.10 Formal roles and informal membership in community institutions within the case study sample**

(Source: Author)

	Member Q27	Membership as % of sample	Role Q23	Role as % of membership
Clubs and Societies	43	24%	22	51%
Council/Local Governance Organisation	13	7%	6	46%
Church	12	7%	4	33%
Commercial Organisation*	8	4%	10	125%
Community Service Organisation	8	4%	8	100%

\*When asked in Q31 to identify any historical role 21 respondents replied affirmatively, so data suggests that membership figure may only represent current activity whereas role may include reference to historic activity

**Table 4.11 Institutional entities with roles relating to flood risk in the case study communities**

(Source: Author)

Rank	Description of insitutinal entity	Maximum Number of Respondents identifying role
1	Local flood group	8
2	Local council	7
3	Environment Agency	3
4	Local company (employer)	3
5	Fire Service	1
6	Church	1

The low level of identification with formal roles in the case study areas suggests that much of the engagement with flood risk issues within communities is done using informal processes and in informal roles. The extent to which the community engages in a process of institutionalisation to address the flood risk was very limited, suggesting that an institutionalised role is either less important or hard to achieve.

Berger & Luckmann (1966) explained that institutionalisation involves the habitualisation of human activity and has the goal of freeing individuals from having

to make too many decisions. So, it may also be that the motivating force of “freeing individuals from having to make too many decisions about flood risk” is lacking, i.e. the communities do not recognise their need to make decisions about flood risk issues and see no need to institutionalise such a role.

The interviews provided a deeper insight into the issue of roles becoming institutions in themselves. For this research, incumbents occupying the roles of local councillor, emergency planner, community liaison officer and flood risk officer were all interviewed. Of these roles, the flood risk officer was a newly created role, Community Liaison Officer was a temporary role and the other roles were well established. The well-established roles could be called institutions, as their incumbents could come and go, but the status and resources associated with the role remained largely the same.

*“My role has existed approximately since 2009 when there were temporary placement people doing the work..... I have occupied the role since June 2010, I had two temporary placements and now I am in a permanent position. I am the first person in the new permanent role.....my role is one of the FROs and I investigate flood incidents to discover who is responsible and chase them to take action....I also take off GIS data and make sure GIS data is up-to-date.”  
Flood Risk Officer (Interview 04)*

*“the role was redundant before I started and I have no contact with any previous occupant of the role....the councils are exploring options as they recognise that they need some form of town management..”  
Community Liaison Officer (Interview 03)*

*“I am in contact with at least 3 past chairmen and there are at least another couple. The Clerk is the person that maintains records and helps with continuity.....the vice chair can easily fill in and I do a lot by email in advance of a meeting, so issues are often nearly resolved before the meeting happens.”  
Parish Councillor (Interview 02)*

*“I have a top team trained. There are 12-13 people and anyone could fulfil my role at an emergency. My aim is that every district will have a top team like mine.”  
District Emergency Planner (Interview 01)*

*“I started in June 2007... I am the first occupant of the role... [Before me] there was a team of 4 officers doing the role. 3 have retired; I can speak to all of them if required.” Regional Emergency Planner (Interview 05)*

The evidence from the interviews above suggests that there are some distinct roles that may be defined as institutional roles and that that these roles are significant in flood risk management. However, it was also clear that, despite the history associated with a role that has become an institution, changes to that institution can occur that can cause the institution to disappear very quickly.

*“Cuts have also had an impact - we have had a recruitment freeze..... Over the last year or so they [the institution] have had a major restructuring, they had several different directorates but they have narrowed it down to two – strategic directorate of people and strategic directorate of place. Highways also had a major restructuring and this department (Planning, Transportation and Environment) has had a consultation but we didn’t change.” Flood Risk Officer (Interview 04)*

*“I started at 5 days per week, have been doing this role 4 days per week for the last three years, but recently dropped to 3 days per week. It is one of three roles and I will be going down to 1 day per week when I take on a 4th role. I also run a sub-group “Coastal Pollution” for the regional LRF.” District Emergency Planner (Interview 01)*

*“...the town council, district council and county council as well as local businesses all contribute towards my salary...the role is finishing, I am at the end of my 3 year contract. The County and district can no longer fund their bits...” Community Liaison Officer (Interview 03)*

#### **4.4.3 The openness of flood risk management institutions**

For this research, evidence was gathered from the case study communities about their interactions with institutions responsible for the management of flood risk. From these data, it was possible to gain some insight into the nature of a flood risk management institution based on its engagement with the community. Building on

descriptions outlined by Hassard (1993), this thesis was able to create its own definition of openness to classify openness of institutions in the FRM framework:

**Closed institutions** - have very few links to other organisations in the flood risk framework and to the case study communities.

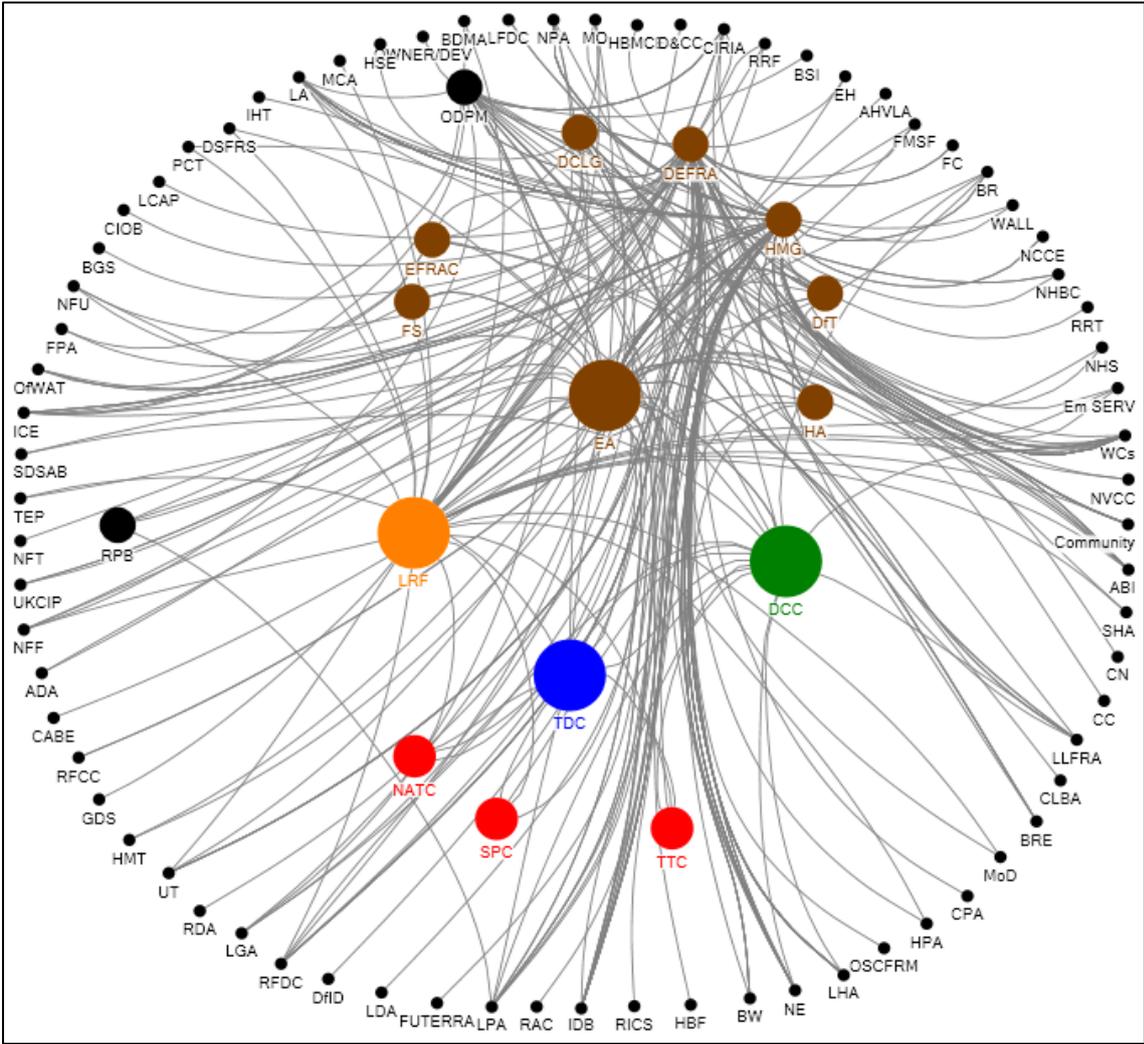
**Open institutions** - have extensive links to other organisations in the flood risk framework and to the case study communities.

**Partially open institutions** - may have extensive links in the flood risk framework or the study communities, but not both.

Using data from the document analysis conducted for this thesis (appendix I), the author was able to identify links between institutions and assess their degree of “openness” (Figure 4.10). The institutions were colour coded according to the level at which they operate in the FRM framework (Figure 4.10). At local level, all case study communities are represented by their respective parish or town councils Newton Abbot Town Council (NATC), Teignmouth Town Council (TTC) and Shaldon Parish Council (SPC). The local level institutions were judged to be very open to the flood risk communities, but evidence from the documents reviewed suggested that their links to the flood risk management framework were limited and mainly unidirectional (i.e. emanating from the FRM framework to the local institution). For that reason, and in respect to flood risk management, local level institutions were judged to be “partially open”.

At each level beyond the local community level, only one institution was clearly distinguished as “open”. Teignbridge District Council (TDC) at the District level, Devon County Council (DCC) at the County level, the Local Resilience Forum (LRF)

at the Regional level and the Environment Agency (EA) at the National level were all judged to be open institutions. These four organisations all possessed good links to the FRM framework and had links to the case study communities. A number of other national level institutions were partially open, mostly government departments that were actively engaged in the development of flood risk management policy. These institutions included the National Government (HMG), which passes legislation that normalises patterns of behaviour in relation to flood risk management, which is important in the development of social capital (Rosenband 2001, Section 2.5.5).



**Key:**

Level – Colour code	Openness – Size of disc
Local	Open
District	Partially open
County	Closed
Region	<b>Figure 4.10: Openness of institutions in the FRM framework</b> (Source: Author)
National	
Closed or not active	

Other partially open institutions were: the Department of Environment, Food and Rural Affairs (DEFRA), the Department for Transport (DfT), the Highways Agency (HA) and the Department of Communities and Local Government (DCLG). The DCLG is interesting because it is relatively new to the FRM framework and its role is still evolving. The DCLG inherited flood risk management responsibilities from the Office of the Deputy Prime Minister (ODPM). The ODPM is no longer active, but when it was in existence, it was active in the development of flood risk policy and its legacy of action is evident in policy documents still currently in use. The same can be said of the Regional Planning Body (RPB), which is no longer active, but reveals a legacy of policy documents that demonstrated its partial openness when it was active. Two other institutions with specialist interest in flood issues were judged to be partially open by virtue of their engagement with other institutions making up parts of the FRM framework: the Foresight group (FS) and Environment, Food and Rural Affairs Committee (EFRAC).

83% of institutions in the FRM framework, were judged to be closed (Further analysis of these links will be undertaken in Chapter 6). The image of the flood risk framework correlates well with evidence collected from the interviews:

*“You need to have strong relations with the EA and the District has always done that.... The LRF flood group meets once per quarter and we talk every time there is a bit of bad weather” (Interview 01)*

*“We [Local level institution representative] are in monthly contact with the EA and we organise a 6 monthly flood response practice with the EA.... TDC have been very good and they are encouraging us to create an emergency plan.” (Interview 02)*

*“We [County level representative] are in the process of setting up a “flood risk partnership” with lots of the local organisations that share responsibility for flood risk management. Our main partners are the EA and District Councils” (Interview 04)*

*“I [Regional level representative] gave a talk recently at Teignbridge District Council to all the local parish and town councils about policy response to major incidents. The local authorities lead on it and we support them” (Interview 05)*

From the questionnaire survey, there was very little evidence of links from the communities to any of the FRM framework institutions (Table 4.11 above). Where FRM framework institutions were mentioned, it was often only when the respondent had a direct link to the institution, not in relation to the management of flood risk in the community.

#### **4.4.4 Lessons learned**

This section started by explaining that this thesis would assess the distinction between institutionalised roles and non-institutionalised roles in flood risk management. In addition, because this research aims to promote the development of community resilience by encouraging links between communities and institutions, the openness of an institution is an important trait to assess.

The analysis of institutionalisation and the “role institution” revealed that their significance is less important than may be anticipated. It seems that roles are created at a reasonable frequency and, whilst a role may have a temporary positive impact on resilience, the fact is that the stability of the institutionalised role is less important.

The assertion that institutionalisation is the habitualisation of human activity and has the goal of freeing individuals from having to make too many decisions also seems less relevant in this case study. Habitualized actions inherent in roles seem to be changed on a regular basis. The motivation does not seem to be freeing individuals

from having to make decisions, but rather to refocus decision making powers in different roles. These are potentially refinements based on improving the efficiency of an “already institutionalised” network and distinct from changes within an “uninstitutionalised” community network.

From the case study community surveys, the results imply that flood risk management is not an active consideration for the communities. As such, respondents to the survey had no reason to link FRM framework institutions to their community.

From the “openness” analysis, a picture is revealed of the FRM framework as a largely closed community. Contact between the FRM framework and the case study communities was dominated by links to the EA and the District Council. Whilst the County and Region had an interest in links with the case study communities, none of the case study communities expressed an interest in connecting with the County or Regional tier of the FRM framework.

## **4.5 Status, power, coercion and resistance in FRM**

### **4.5.1 Section outline**

The last section showed that some institutions in the FRM framework are more or less institutionalised and some are more or less open than others. In this section, issues associated with the drivers that lead institutions to become more or less institutionalised or to become more or less open are explored.

The first of the drivers to be explored relates to the status of the institution. The issue of an institution’s status draws upon research by Brinton and Nee (1998). To

Brinton and Nee, status was evidence of the institution's pivotal role in the community. They found that "lesser" institutions (say "role institutions") can sometimes occupy a more significant (or pivotal) role than ordinarily expected. Hence, the linkages between institutionalisation, openness and status will be explored in more detail by this thesis. The exploration will aim to build an understanding of how best to direct the efforts of those wishing to improve community resilience using community-institution links.

The second driver to be explored in this section relates to the exercise of power in the FRM framework. The exploration will focus on what Hodgson (1998) found, namely that institutional objects are not formed without some degree of resistance or coercion. The existence of resistance or coercion can signify many things, but this research is interested to learn if it relates to the creation of new institutional objects that are designed to address local flood risk issues, or if it has some broader significance.

#### **4.5.2 Institutional status in flood risk management**

Interviews conducted for this thesis revealed data that highlighted the high status of emergency planning roles in the FRM framework. Emergency planning is a specialist technical role and the incumbent often has access to a range of capital resources essential for the effective management of flood risk:

*"...I [Emergency Planner] wrote the policy and I train the others on how to implement it...four strands to my role - Plan development, warning and informing, training, communications with others.... I liaise mainly with the internal drainage team and they do a lot of the liaison with external bodies on flood issues" District Emergency Planner (Interview 01)*

*"Developing an emergency plan in on our [Parish Council] agenda" (Interview 02)*

*“I [Community Liaison Officer] was involved in Emergency Planning in my previous role and we did have a bomb alert ..... if I had stayed here [Newton Abbot] longer, my goal was to have something similar as there is no reason why the private business sector should not have a plan, not just for flood but for any emergency, and there isn’t anything in this town at the moment.” (Interview 03)*

*“The Emergency Planners are much more involved [than Flood Risk Officers] at the community level.” (Interview 04)*

*“Operationally we [Emergency Planners] are not so constrained. We can get gold command to make a decision if we think it is needed. We have a nationally agreed guide on decision making and as long as we follow the guide we can change policy if we think the situation requires it – dynamic risk assessment system” (Interview 05)*

Another role that featured significantly in the institutional interviews was the role of “councillor”. Councillors have a high status by virtue of the control they exert over policy:

*“I [Emergency Planner] talk to Councillors about restructuring. Cuts of £10m do have an impact, but they must not impact of the delivery of services” Interview 01)*

*“We [councillors] are the link between the local community and district council. We are on the ground and can listen to local public concerns and take them forward...It is up to me to select issues that are important...[councillors] can set up a working party if necessary to deal with extra issues.” (Interview 02)*

*“Councillors are where most pressure comes from – we [Flood Risk Officers] have to keep them happy” (Interview 04)*

Both emergency planners and councillors operate at all levels of the framework.

However, data collected for this research revealed that the regional tier of both emergency planners and councillors was recently abolished:

*“The regional level of emergency planning has recently been abolished. LRF are formed around the 40 National Police Authorities and the Regional Gov. The South West had a Regional Resilience Forum which included 4 or 5*

*LRFs. .... the LRF flood group meets 1 per quarter and we talk every time there is a bit of bad weather.” (Interview 01)*

*“The Regional government was abolished....The RCCC never really worked anyway. We [Emergency Planners] do not have many regional level issues, but the new system will be tested when we do have an incident; when one area needs help from another in the region. We are rebuilding the regional system in a different way.” (Interview 05)*

According to the emergency planners interviewed for this research, the emergency planning community quickly adapted to the loss of regional institutions, transferring resources, power and status to the Local Resilience Forums (LRFs). By contrast, within the political community, there has been a continuation of uncertainty surrounding the status of remaining political institutions, as illustrated by this quote from a local councillor:

*“There is an intention to divest responsibility down to parish level. We are concerned that the district is trying to get rid of its assets and pass them down to the parish level, but we have no money or people to handle new responsibility. ....the Localism Bill is a worry.” (Interview 02)*

The last quote echoes an oft raised issue, namely that status may sometimes provide a false sense of capacity for action by institutions:

*“I [emergency planner] have no control over resources, I only advise. But we do issue sand bags. Other than that we have the quarterly newsletter.” (Interview 01)*

*“In my role [local councillor] I respond to day to days issues on parish affairs – dog poo and dog bins to emergency planning” (Interview 02)*

*“Businesses don’t quite understand it. If you went into the businesses and asked them about the Town Centre Partnership, they would not know what it was. If you asked if they knew me[community liaison officer] they would say yes. There is a perception that I work for the council and that may be one of the solutions going forward, but it is more helpful not working for the council as the*

*business community feel I am far more accessible as one of them, rather than one of the council.” (Interview 03)*

*“We [flood risk officers] are not really the experts that people think we are.... The EA is where we go, also the drainage engineers.....” (Interview 04)*

Perhaps most importantly for flood risk management is that the only institution above county level that received any mention by interviewees (and was always mentioned in a positive light) was the Environment Agency (EA). Despite the plethora of institutions involved in flood risk management at the national level, only the EA achieved any indication of elevated status:

*“You need to have strong relations with the EA and the District has always done that.” (Interview 01)*

*“Working with the EA has been easy. The EA did most of the technical liaison and they have been very good.” (Interview 02)*

*“We are in the process of setting up a “flood risk partnership” with lots of the local organisations that share responsibility for flood risk management. Our main partners are the EA and District Councils” (Interview 04)*

The status of the EA is interesting, as it is a relatively new institution (formed in the 1990s) and its role in flood risk management has changed significantly in the past ten years. The EA is now much more engaged with urban planning and this engagement has brought the EA into direct contact with many community level institutions. When coupled with control over the resources needed for the development of solutions to flood risk issues, the status of the EA has been elevated in this analysis and it now plays a pivotal role in the flood risk community. In this instance, the pivotal role was first legislated and its status developed as the EA worked to fulfil its legislated role.

### 4.5.3 Power, coercion and resistance in the FRM system

Starting with the coercion issue, Hodgson (1988) stated that some institutions have power to exert influence over communities' ideas and actions, even when communities are opposed to those ideas and actions. Parboteeah & Cullen (2003) added that national level institutions exert powerful coercive influences on behaviours and values in local communities, but are largely independent from influences acting in the opposite direction. Finally, Wicks (2001) concluded that coercion can result in harmful mindsets that predispose actors to accept inappropriate risks and that are often the antecedents of disaster. These issues all have some resonance within the findings for this research.

It was made clear in previous sections of this chapter that political elites have significant influence over the ideas and actions of the FRM institutions. It is perhaps the role of the politicians to coerce those in "more technical" roles to re-prioritise their efforts when trying to balance competing demands on limited community resources:

*"Because we [District Council] are a political organisation, the priority for politicians is that the cutting face is made more effective" (Interview 01)*

*"I think it is a combination of the economic situation where all the councils are having to make cuts, and the role was seen as one that could be cut. Not because times are good, but because there was a belief that something else could pay for it." (Interview 03)*

*"Over the last year or so they [County Councillors] have had a major restructuring, they had several different directorates but they have narrowed it down to two" (Interview 04)*

It is also clear that higher level political strata are attempting to coerce lower levels to comply with policies with broader objectives:

*“TDC [District level institution] have been very good and they are encouraging us [community level institution] to create an emergency plan. Up until now we [Local councillors] did not have the energy to do it.... There is an intention to divest responsibility down to parish level. We [Parish Council] are concerned that the district is trying to get rid of its assets and pass them down to the parish level, but we have no money or people to handle new responsibility. We are reluctant to take on management responsibility. The parish council is too small. Even taking on public toilets is too big.” (Interview 02)*

*“I work as part of a team of four - 1 manager, 2 flood risk officers (FROs), 1 technical assistant. The team was set up in response to the new Flood & Water Management Act (2009).... We are about to take on new duties - the EA is handing over responsibility for consents related to developments affecting “ordinary” water courses – it comes into effect in April 2012” (Interview 04)*

However, coercion did not only operate one way. There was evidence of technical role incumbents providing some degree of coercion to the politicians:

*“...because they [councillors] are taking my [emergency planner] advice already it is easy to get my organisation to adopt a solution that I have proposed....I talk to councillors about restructuring. Cuts of £10m do have an impact, but they must not impact of the delivery of services.” (Interview 01)*

The interview data suggests that the “role institution” may play a part in the effectiveness of the technical role incumbent being able to achieve success in coercion. In this case study, the community liaison office role did not have a significant history and the role was less of an institution and the incumbent was less successful in attempts at coercion of the community:

*“... the issue of snow wardens is similar. I [Community Liaison Officer] have written to all businesses in the town, it has been on the radio and in the papers, wherever the local authority could get it and I have also given them a hard copy on information relating to snow wardens, but I have not had a single response.” (Interview 03)*

*“...At a recent meeting many of the sub-groups were there but most businesses were not as they were too busy running their businesses, and this is one area*

*where I [Community Liaison Officer] feel I have failed – in creating some sense of a business “community”. (Interview 3)*

By way of contrast, the district emergency planner role has existed for a long time and is an institution in itself:

*“We [Emergency Planners] started advising people that if they wanted sand bags they were probably at risk and should install flood boards. Now we do not supply as many sand bags – this was an important change in the mind-set of the community, who used to think that the council would always provide help – “we turned the tide” and we are still trying to encourage self-help. That has worked and we are now doing it at the town and parish level.” (Interview 01)*

There was evidence of some resistance to attempts at coercion by political elites.

That resistance could be active:

*“We [Parish Council] are reluctant to take on management responsibility. The parish council is too small. Even taking on public toilets is too big. We have a total income of 19K. District Councillors are paid, we are not.” (Interview 02)*

Or resistance can be passive:

*“When trying to implement policies I [Community Liaison Officer] do not encounter resistance, just apathy.” (Interview 03)*

And sometimes the messages are difficult to discern, whether there is a passive resistance or if there is a passive acceptance:

*“Following the Pitt report, FRM responsibility was transferred to top tier county authorities. District had been doing it for years and now County has to re-invent it.” (Interview 01)*

The last quote is included here because, although the content is somewhat factual, the suggestion in the interview was that the role incumbent was resentful, but resigned to the change. There was also a suggestion of an “active lack of engagement”, which is a form of resistance.

There was one bright note where coercion was successful in overcoming resistance to achieve a positive community outcome specific to flood risk:

*“Right at the beginning there was quite a bit of disbelief about a flood risk. The link to climate change was not well accepted. People were more concerned with the aesthetics and not the degree of protection provided. 2008 was a very close call and that did help to focus people. Most people were very anxious about rain runoff flooding, not sea flooding. Fortunately the EA took on this concern and dealt with the issue at the same time as the tidal flood. EA have given us [Parish Council] authority to open gates if water starts accumulating behind the gates to let it runoff.” (Interview 02)*

What this section has shown is that coercion is very much a part of the flood risk framework, driven as it is by political elites who control resources and have power to create or dissolve institutions. Resistance is also part of the process, perhaps as a negotiating stance to secure more resources or to protect power structures by role incumbents. However, both are probably necessary if the right solution is to be found as indicated in the last quote above.

#### **4.5.4 Lessons learned**

In this section, the status of political and technical role institutions has been examined. The technical role of “emergency planner” and the political role of “councillor” were presented as having high status in the FRM framework. These roles play an important part in efforts to coerce or resist changes within the FRM system. To this end, the status of the role institution has a significant impact on the

effectiveness of those efforts. The higher the status the more effective the role incumbent may be in coercive or resistive efforts.

No matter how high the status of a role, every role is subject to change. When this happens, the support structure surrounding the role has an important part to play in ensuring that the FRM framework is not adversely affected. Evidence presented in this section showed that the technical role institutions were able to rapidly re-organise in the face of change, but political roles are less easily adapted. This is a resilience issue and highlights the two faces of resilience as a process of adaptation or as an outcome that is resistant to change. Each has its place, but sometimes too much resilience can lead to negative outcomes.

Also in this section, the EA was revealed as a high status, quasi-independent, non-political institution with a pivotal role at the heart of the FRM framework. The EA does not have a long record of existence and as such its status and pivotal role is more than expected. The role of the EA has rapidly developed and was driven by effective coercion by national level institutions with the power to impose duties and powers on the EA by legislative means. For the EA, together with obligations to address FRM issues comes control over capital resources, resources which the technical and political role incumbents in other FRM institutions did not have but need in order to address local flood risk issues.

The role of the EA is interesting, not least because of its rising power and resources, but also because it has been given the role of “arbitrator” in arguments between technical and political role institutions. Evidence for such a role can be found in documents outlining the rationale for the involvement of the EA in planning applications where flood risk was an issue. The question that is not answered by this

analysis is what long-term impact the rise in power of the EA will have on other institutions in the FRM framework. The EA has the potential to become so powerful that all other institutions fade into insignificance. The consequence might be that institutions currently engaged in the FRM framework lose interest and are “closed out” from the decision-making system. The author is also mindful that the EA were unwilling to be interviewed as part of this research and questions if this is an indication of the EA becoming less open. If the EA does become less open and other FRM institutions become disenfranchised, then this may have an adverse effect on the resilience of the overall FRM system and ultimately on the resilience of flood risk communities.

## **4.6 Flood risk management policy networks**

### **4.6.1 Section outline**

In Chapter 2, a number of issues related to policy networks were outlined and this section will explore in more detail a few of the issues raised. One issue of importance for this research is that FRM itself has become a very topical issue. Literature reviewed for this thesis has suggested that policy makers have harnessed the popular interest in FRM by modifying the system of governance for FRM issues (Pelikan 2003, Silva 2007). Those modifications centre on the increased use of policy networks, which are described as large, flat and decentralised governance structures (Kenis and Schneider 1991, Marin and Mayntz 1991, Scott and Meyer 1994). Policy networks can introduce risks associated with large social networks, risks like: the formation of power structures, cliques, factions and elites (Ensiminger 1998, Pelikan 2003, Silva 2007). These power structures can influence ideas and values within the network and undermine the democratic principles that the system is

set up to exemplify. For this research, evidence of such influences at work in the flood risk management institutional network is important to assess.

In this section, the FRM framework is analysed in three stages. The analysis starts by examining the national level institutions that work to shape FRM policy. The analysis then focusses on the regional level, where much of the recent institutional change has occurred. Finally, an image is created of how FRM policy networks are evidenced at the levels closest to the case study communities.

#### **4.6.2 National level policy networks in flood risk management**

The research conducted for this thesis has already outlined the range of institutions engaged in flood risk management and has presented them within a framework comprising six levels (Sections 4.2 & 4.3). For the policy network analysis, the main source of data was policy documentation. The questionnaire survey did attempt to elicit details of actions taken by individuals, businesses and the case study communities in relation to local flood risk issues, but very little detail was forthcoming. The interviews were more informative, but again lacked significant detail. Where the policy networks really became apparent was at the national level and to a lesser extent at the regional level.

Document analysis (appendix I) revealed three broad policy networks with an influence over values, systems and behaviours of actors in the flood risk management framework. The three networks focussed on civil contingency planning, development planning and environmental planning. From the policy documents, the author was able to identify where institutions in the flood risk management framework sat in relation to these three policy networks. The analysis distinguished between government institutions, institutions with specific delegated responsibility,

specialist advisory institutions and flood risk special interest institutions. Figure 4.14 below illustrates how the national level entities in the flood risk management framework fit into such an arrangement.

The “openness” analysis in Section 4.4 revealed nine open or partially open institutions within the FRM framework at the national level. When examining those nine institutions, the network analysis reveals that HMG and DEFRA are very important institutions, guiding macro-political policy across all three networks. The EA, which is the one “open” institution at the national level also possess delegated responsibility across all three policy networks. The status of HMG and DEFRA is enhanced by their involvement across all the policy networks. Collectively, these three institutions (EA, DEFRA and HMG) could be described as a “clique” (Silva 2007) with a significant influence over the rest of the flood risk management framework.

When DCLG took over responsibility from the ODPM, some of the flood risk management policy responsibility was not transferred (discussed further in Chapter 6). If the DCLG had retained all of the ODPM responsibility, its status would have been enhanced within the FRM framework. As the DCLG still retains some influence over two policy networks, its status is higher than the other partially open institutions. The other partially open institutions (DfT, HA, EFRAC and FS) are all only operational in one of the policy networks when dealing with matters to do with flood risk management (Figure 4.11).

Sub-level of operation	Civil Contingency Planning	Development Planning	Environmental Planning
Government Institution	HMT	DfT	DFID
Institution with Delegated Responsibility	EA, BW, NE		
	HA, OFWAT, LGA		
	CC		CC
	NCCE, ADA, EH FC, HPA, HSE	EFrac	
Specialist Advisory Institution	ABI, CIRIA, BRE		
	ICE		
	UKCIP		
	NHBC		NHBC
	BGS, CLBA, NFU	MO, BSI, CABE CIOB, IHT, RICS	FUTERRA, WALL
Flood Risk Special Interest Institution	CN, FMSF, FPA NFF, NVCC		

**Figure 4.11 Clustering of national level institutions into a FRM policy framework**

**(Source: Author)**

In Figure 4.11, gaps in the institutional structure are revealed. This thesis did not find a current government institution with an interest spanning that of the old ODPM. In addition, there was no evidence of government institutions with a special interest combining civil contingency planning and environmental planning. Within the group of institutions with delegated responsibility, there was no evidence of an institution

mirroring the interests of the old ODPM and no institution with environmental planning as its sole area of input to the FRM framework. There was a full complement of specialist advisory institutions. However, within the special interest grouping, there was no evidence of institutions operating in development planning or environmental planning networks. What this reveals is that the civil contingency planning network has the strongest voice in the FRM framework, the development planning network has a moderately strong voice and the environmental planning network has the weakest voice.

#### **4.6.3 Policy networks at the Regional Level**

The overall structure used to represent national level networks can also be used at regional level. At regional level, the FRM framework is more sparsely populated. Government institutions that direct policy at this level (SWGO and SWRDA) were both abolished in 2011 (Figure 4.12).

The MoD is the sole remaining government institution operating at the regional level, but its input is strictly limited to a supporting role in civil contingency planning. Institutions with delegated responsibility are dominated by institutions that make up the LRF, which relegates the role of the LRF itself to that of a specialist advisory institution when dealing with issues specific to flood risk. Within the specialist advisory institutions, the civil contingency planning network is well represented, but the other two networks are less well represented. The only flood risk special interest institution (SWRFDC) was abolished together with the regional governance institutions.

Sub-level of operation	Civil Contingency Planning	Development Planning	Environmental Planning
Government Institution	MoD	SWGO SWRDA	
Institution with Delegated Responsibility	D&CC, DSFRS SWAS, SWSHA	NPA SWW	MCA
Specialist Advisory Institution	AHVLA, GDS SWLRF, BRC	SWRBLP Elec, Gas, Rail, Telecom	AHVLA, GDS
Flood Risk Special Interest Institution	SWRFDC		

**Figure 4.12 Clustering of regional level institutions within the FRM policy framework**

(Source: Author)

Despite the very obvious gap in government Institutions and flood risk special interest institutions, the overall assessment of the FRM framework at the regional level is similar to the national level. Specifically, the civil contingency planning network has the strongest voice, followed by development planning and then environmental planning. However, the drop off in institutions representing both the

lesser networks is significant, whilst civil contingency planning representation remains robust.

#### **4.6.4 Policy networks below the regional level**

Below the regional level, the range of FRM institutions decreases sharply and gaps in the framework become very evident. Figure 4.13 below illustrates the distribution of FRM framework institutions within the policy networks below regional level.

At the county level, Devon County Council (DCC) is a governing body and spans all networks. At the district level, Teignbridge District Council (TDC) is the most significant organisation and again acts as a governance entity with inputs to all three networks. At the local level, the three governance entities of Newton Abbot Town Council (NATC), Teignmouth Town Council (TTC) and Shaldon Parish Council (SPC) all have inputs to the three networks. The only other institution of significance comes from the questionnaire survey that identified a flood risk pressure group in Teignmouth, the Teignmouth Back Beach Committee (TMBBC).

The figure is helpful in illustrating that below the regional level there is really no institution in the flood risk management framework promoting development planning and environmental planning network objectives. It is left to the governance bodies to deal with all FRM issues. The loudest voice, all-be-it severely muted, in the ears of the governing entities is coming from the civil contingency planning network. What Figure 4.16 reveals is that, due to the sparseness of organisational institutions, below the regional level “role institutions” have a much more significant impact on FRM policy and decision-making than organisational institutions.

Sub-level of operation	Civil Contingency Planning	Development Planning	Environmental Planning
Government Institution	DCC, TDC, NATC, TTC, SPC		
Institution with Delegated Responsibility			
Specialist Advisory Institution			
Flood Risk Special Interest Institution	TMBBC		

**Figure 4.13 A representation of Local FRM institutions in the policy network framework**

**(Source: Author)**

Within the role institutions, roles with delegated responsibilities for each of the policy networks can be found (emergency planning, development planning, and environmental planning). Those roles also act in a specialist advisory capacity to the governance roles (Councillors). Where there does appear to be a gap is flood risk

special interest institutions from the development planning and environmental planning networks.

#### 4.6.5 Evidence of “role institutions” in FRM policy networks

There is evidence of the role played by the development planning network in FRM issues, via the HA and its sub-agents. That input is evidenced at the district level by the fact that the civil contingency planning role was historically in a highways department:

*“I did have access to the previous occupant of the role at the beginning, but not anymore. I was in contact with the **group engineer for drainage and coastal**. He put together an emergency plan for the council before the CCA 2004.... he mentored me when I was given my current role.” Emergency Planner (Interview 1)*

At the county level the flood risk management role is situated in a department that spans all three policy network areas and there is also evidence of active engagement between the civil contingency element and the highways element of the team:

*“Councillors are where most pressure comes from – we have to keep them happy. Cuts have also had an impact - we have had a recruitment freeze..... Over the last year or so they [the institution] have had a major restructuring, they had several different directorates but they have narrowed it down to two – strategic directorate of people and strategic directorate of place. Highways also had a major restructuring and this department (**Planning, Transportation and Environment**) has had a consultation but we didn’t change.” (Interview 04)*

*“I work as part of a team of four - 1 manager, 2 flood risk officers (FROs), 1 technical assistant..... The other FRO maintains an asset register with all the flood risk structures and features (sect 21 of the Act). He also monitors the **SUDS requirements under the Act**.”(Interview 04)*

*“Internally I liaise mainly with the **internal drainage team** and they do a lot of the liaison with external bodies on flood issues, they also help out generally on*

*planning issues. We are lucky to have a large team. We also liaise with DCC flood risk management team set up after the Pitt Report. Also liaise a lot with the EA.” (Interview 04)*

The link to development planning in relation to flood risk was also a feature of concern for the local community level:

*“Right at the beginning there was quite a bit of disbelief about a flood risk. The link to climate change was not well accepted. People were more concerned with the aesthetics and not the degree of protection provided. 2008 was a very close call and that did help to focus people. **Most people were very anxious about rain runoff flooding, not sea flooding.** Fortunately the EA took on this concern and dealt with the issue at the same time as the tidal flood. EA have given us authority to open gates if water starts accumulating behind the gates to let it runoff.” Parish Councillor (Interview 2)*

Interestingly, only the community liaison officer, operating at the community level, provided any evidence of engagement with the environmental planning network:

*“...At a recent meeting many of the sub-groups were there but most businesses were not as they were too busy running their businesses, and this is one area where I feel I have failed – in creating some sense of a business “community”. I cannot get the message through that it will benefit you if you become a part of a whole. Transition town is the group that is trying to get the community to face issues to do with **long-term sustainability issues** (started in Totnes and now a national movement). They are trying to engage with the community, but this is where the localism thing doesn’t quite work because you do need a body of people who are paid to deliver that in order to have it there, I don’t think you can rely on the community and the business community. People want a body that acts as a parent - they do not want to do it themselves.” Community Liaison Officer (Interview 3).*

These data confirm that within the FRM framework, the civil contingency planning policy network is very dominant. The urban planning network is also significant but mainly via the elements to do with highways and urban drainage. The environmental

planning network is significant only in the policy documents and seems to be less significant at the community level.

#### **4.6.5 Lessons learned**

In this section, three policy networks active in FRM were revealed and analysed, namely: The civil contingency planning, development planning and environmental planning. Although gaps in all three networks were evident at different levels in the FRM framework, what was evident was that the civil contingency planning network was the most actively engaged in FRM. The author is mindful that his own background spans all three networks, but has a civil contingency bias. As such, analysis may have swayed efforts and interpretations in favour of civil contingency planning during data collection and analysis. That being said, as much of the data gathered was from documentary evidence, the bias of the author was limited. A spectrum of interviewees was sought from across the three networks, but those engaged in civil contingency planning were more willing to engage with the research, and this did bias the interview data. However, the interviewees did make reference to other policy networks and their testimony reinforced data from the documentary analysis, namely that the civil contingency network was more active in dealing with FRM issues than the other networks.

Another point revealed from the exploration of FRM policy networks is the divide between the national and regional levels and sub-regional levels in the FRM framework. At national and regional levels, organisational institutions dominate the networks, but at sub-regional levels role institutions are more influential. At the sub-regional level the lack of role institutions giving voice to development and environmental issues in relation to FRM policy and action is a problem. Civil

contingency planning has been criticised for often having a short-term perspective (Bosher *et al.* 2007) and if it dominates FRM policy and action at the local level, then long-term community resilience may be difficult to achieve.

## **4.7 Conclusion**

This chapter began with an exploration of how institutions interact with communities to build community resilience. As the first of four chapters that will explore this theme in detail, this chapter focussed on developing a deeper understanding of institutions and their interactions with communities. First presented was a framework of institutions with an input into the management of flood risk as it affected the three case study communities in Newton Abbot, Teignmouth and Shaldon. Within the framework the significance of institutionalisation at the individual and collective levels was explored. The FRM framework was also analysed to reveal the different policy networks encapsulated within the framework and power structures that influence the institutional framework. The exploration focussed upon a number of issues raised in previous research and attempted to judge its significance in the context of flood risk management. In some cases, issues raised in prior research manifest themselves in this research in an obvious and important way, but, in other cases, their manifestation was less evidence or less significant.

The first issue covered was one raised by Searle (1995) and related to the claim that institutions leave no evidence of their existence in the real world. To the author, that was important because resilience is an ever-present human faculty (Chapter 2, Section 2.2) and a snapshot view of resilience is not helpful unless placed in a historical context. The historical context reveals important trends that enable a picture of rising or declining resilience to be revealed. Any assessment of resilience

with an institutional element needs to be able to “see” institutions in current and past forms. In this instance, evidence was found of “abolished” institutions where indelible markers of their existence were indeed absent from the current view of the physical world. However, broadening of the definition of the physical world to include textual data provided an effective proxy for the existence of the institution in current time. Textual data has a longevity that greatly outlasts the existence of the institution itself. Indeed the textual data was significant in identifying holes in the framework, some of which had been successfully circumvented, as illustrated by the transfer of regional resilience planning to local resilience forums. In other instances, the holes had led to a policy vacuum with the potential to de-stabilise the resilience framework. The latter point is well illustrated by the on-going battle to redistribute resources, responsibility and authority between governance bodies at national and sub-regional levels. Holes in the institutional framework are both a test of the resilience of the framework and an indicator of internal pressures that could cause the system to fragment.

The issue of the need for roles to have undergone some degree of institutionalisation was also explored. In this case, the author was interested to know if the habitualisation of activity and the creation of rules and/or procedures was significant in a flood risk management approach that was driven by community-institution links. These links are central to this thesis, and what was found seemed to downplay the significance of the need to undergo some form of institutionalisation within the community for these links to work. It is even possible that institutional liaison roles with institutionalised elements of the community were less highly regarded. Institutions feared the manipulation of community views by institutionalised community objects. From the community perspective, the effort needed to undertake some form of institutionalisation was perhaps more than the community could muster

in times when no threat from the hazard was visible or imminent. Such a strategy is not entirely misplaced as the evidence from the institutions themselves revealed how tenuous the institutional object is once created. Evidence from the institutional framework revealed how roles and institutions can be created quickly and just as quickly disappear. For a community to expend capital in the institutionalisation process, there must be an immediate and demonstrable return. If things can be achieved without recourse to institutionalisation, they will be undertaken in a less formalised manner.

It was the review of resistance and coercion that often surrounds the institutionalisation process that shed some light onto the possible reasoning behind the approach adopted by communities outlined in the last paragraph. Extensive evidence was found of coercion within the flood risk management framework, driving the normalisation of behaviours or the segregation of roles and resources. The coercive elements seemed to go hand-in-hand with resistance, either active or passive. The resistance could be seen as a way of testing the resolve of those exerting the coercive pressure and may simply, in this context, be seen as a normal pattern of negotiation. If coercion is necessary and if resistance is to be expected then it is possible to see why communities may find it difficult to institutionalise. Some form of power hierarchy is needed for the coercion pressure to manifest itself and if there is no resistant counterpart there is no place for the coercive pressure to stick. Hence, if some elements of the community are fearful of flooding, but lack the power to exert pressure on others in the community to comply with their will, then institutionalisation will not happen. Even if the elements of the community do have power, if the rest of the community is unwilling to comply, then here again institutionalisation will not happen. Both a powerful elite and a willing (but resistant)

set of accomplices are needed to mobilise communities to institutionalise to address a threat - in this case the flood hazard.

Having established a structure with the hierarchy needed to instigate and maintain institutional objects, these objects themselves can then set about acquiring status and a pivotal role in the larger institutional framework. However, what this exploration revealed was that the status and pivotal role occupied by one institution can be circumvented and undermined by the actions of other institutions. In this case, the Environment Agency was identified as working almost outside (and potentially independent from) the rest of the flood risk management framework. Several institutions were described as having either status or a pivotal role, but the suggestion that status was an indicator of a pivotal role was undermined by existence of the Environment Agency. Two things contrived to create a unique position for the Environment Agency: first was its ability to act at all levels in the framework, and second was its control over resources. As an “apolitical” institution, the Environment Agency was less obvious in the coercive actions of institutions within the framework, as this was driven by political entities. Yet, its input to policy at the highest levels suggests it has a hand in directing coercive pressure. Curiously it is also a compliant servant of institutional pressure with delegated responsibility to implement policies. Where it has an advantage over other institutions in its implementation role is its ability to control a considerable amount of resources. The control over resources gives it considerable status. So, status is not necessarily linked to a pivotal role, but when a pivotal role is combined with control over resources then status is increased.

The section examining openness of institutions helped to explain, in more detail, the link between status and the pivotal role played by the institution. This section measured openness by identifying the number of connections to other institutions in the framework. The County was revealed as a crucial link between district and local level institutions on one side and regional and national level objects on the other side. The Environment Agency was able to circumvent this bottleneck. Unlike most other national level institutions, the EA's delegated responsibility gives it the ability to make contact with institutions at all levels without having to refer to or rely on the county to act as an intermediary. That has an important effect for resilience as it provides an alternative pathway for local level institutions to access the more powerful and resource rich institutions at regional and national levels. It also serves to weaken any potential power concentration at the bottleneck. At this point in time, the alternative route is particularly important as recent changes to the political hierarchy at the regional level and newly transferred responsibilities to the county in relation to flood risk management have concentrated power and a pivotal role in flood risk management on the county council. However, the county has no status in the flood risk institutional framework and thus the entire framework is at risk of segmentation until the county can establish its status. While the county builds its status, the Environment Agency plays a crucial role in bridging the gap.

By way of consolidating the institutional analysis, the last section of this chapter looked at how institutions work collectively to address flood risk management by basing themselves in broad policy networks. Three such networks were identified as contributing to the overall management of flooding: civil contingency planning, urban planning and environmental planning. The research revealed that institutions involved in civil contingency planning currently dominate the flood risk management

framework and that the least influential network was the environmental planning network. The degree of influence was based on the measure of openness and it revealed that none of the institutions with specialist interest in promoting either urban or environmental planning had a high degree of connectivity to the rest of the flood risk management framework. The analysis also revealed that nearly all levels of the framework included at least one well-connected institution with overarching engagement with all three networks. The only level where this overarching body was lacking was at the regional level and this is potentially significant as there is very little engagement with the policy networks below regional level. So, it seems that policy networks are a feature of flood risk management, mainly at national level, but the region plays an important role in linking the national networks to local institutions. The civil contingency planning network had strongly connected regional groups and it was these groups that were driving policy implementation at local level. This was illustrated by the frequent reference to emergency planning and efforts by emergency planners to engage local councils in the development of emergency flood risk plans. This is potentially a problem for resilience planning as civil contingency planning is widely described as a short-term and reactive policy network. Both urban planning and environmental planning incorporate long-term “sustainable” solutions into their policy networks, so reducing the significance of these to networks limits the ability of a community to achieve sustainable long-term resilience.

## **Chapter 5. The flood risk communities**

## 5.1 Introduction

This chapter begins its analysis with an exploration of the communities in the Teign Estuary of South Devon that were the focus for this study. The exploration will seek evidence to test the validity of competing concepts about communities, as espoused by the traditionalist, modernist, academic, institutional and critical pundits identified in chapter 2. Specifically, in Section 5.2, the author will assess the utility of the traditional concept of community, which has come in for such criticism by modern authors (Amit 2002, Day 2006, Delanty 2003). It will also assess the claim that institutions hold nostalgic (simplified) views of communities, views that are influenced by their need to more effectively target increasingly limited resources (Frankenberg 1969, Gottdeiner and Budd 2005, Marsh and Buckle 2001).

Associated with the latter point in the last paragraph, Section 5.3 explores data collected for this thesis to reveal any evidence that modern communities are being forced to take on roles more commonly associated with wider society or the state, as described in some parts of the community literature (Crow and Allen 1994, Delanty 2003). Associated with the move to take on more responsibility, this section also analyses the congealing effect that such action has on local communities (Hill 2000).

In the community literature, there is a well-established tradition of authors detailing how communities are dominated by political and economic elites that determine policies and define the goals and values of the communities they purport to represent (Amit 2002, Anderson 1983, Bell and Newby 1971, Crow and Allen 1994, Day 2006, Delanty 2003, Hill 2000). Evidence of stratification and elites in action within the case study communities is examined in Section 5.4. Section 5.5 extends the analysis to assess how power structures in the community have been diffused by

ever extending social networks. Section 5.6 concludes the analysis by exploring the effect of modern community members being more easily allowed to opt in or out of local community membership (Bauman 2001, Etzioni 1995).

## **5.2 The usefulness of the traditional community concept**

### **5.2.1 Section outline**

When reviewing the literature relating to community research, the author was struck by the criticism that the community concept has received in recent years (Amit 2002, Day 2006, Delanty 2003, Wilson 2012). For many years, researchers have pointed to a divide between academic and institutional versions of the community concept (Frankenberg 1969, Marsh and Buckle 2001). When highlighting that divide, institutions were often described as having a “traditional” interpretation of the community concept (Gottdeiner and Budd 2005). The implication was that the traditional view was less valid for modern researchers. However, as this research has progressed, the author has come to appreciate the utility of the traditional community concept. This section sets out how the utility of the traditional community concept revealed itself and provides some explanation as to why institutions still prefer this interpretation of the concept.

In setting out the case to support the utility of the traditional community concept, this section first explores how the concept is used in the FRM framework. Next, the merit of using the traditional definition when studying the three case study communities is assessed. Finally, evidence of how FRM institutions use the community concept is analysed.

### **5.2.2 The community concept in the FRM framework**

In this research, four distinct “communities” were targeted for detailed study. Three of the communities were all population centres at risk from tidal flooding in the Teign Estuary, namely: Newton Abbot, Teignmouth and Shaldon. In each of the case study areas, neither academic nor institutional researcher would have difficulty ascribing the term “community” to the population sample. The fourth group was the framework of FRM institutions (outlined fully in Chapter 4). The FRM framework was least likely to conform to the traditional view of a community. However, to an audience familiar with modern academic definitions of the community concept, the author would have no problems ascribing the term “community” to the framework.

To an audience with a traditional understanding of the community concept, the diffuse nature of the FRM framework and the tenuous links of some members to this “community” would cause some to question the use of the term “community”. On the other hand, for an academic researcher the use of a community based approach to analyse the FMR framework, illustrates how powerful the community concept can be for providing a basis to understand complex social systems. By presenting the institutional framework as a community, the author is deliberately creating a distinction between it and a “complex social system”.

The review of social institutional research (Chapter 2) highlighted that a “social system” is one where actors are considered to be rational operators, bound by contractual ties (Tonnies 1935). Operations performed by actors in institutionalised communities are functionally focussed. However, the FRM framework reveals bonds that are more “commitment” based. The commitment stems from the desire to protect social and environmental systems from harm, in this case caused by flooding.

This emotional trait was frequently encountered throughout the policy documents reviewed and, importantly for this analysis it gives the FRM framework a sense of “community”. To be included in the framework, institutions have to declare in some way that they shared this commitment. The quote below sums-up this emotional commitment quite well:

*Many participatory stakeholder groupings exist for various aspects of coast/catchment/estuary planning relevant to FRM [Flood Risk Management], and several of these include formal partnerships, characterised by membership agreements and shared commitment to resourcing and outcomes. (EA 2006)*

The shared emotional interest fits well with the traditional definition of a community, and if an audience struggled to understand the institutional framework as a community, as soon as the shared emotional trait is explained, they will instantly be able to perceive the network as a community. This illustrates the power of the traditional definition of a community to unify academic and institutional research.

### **5.2.3 The community concept applied to populations at risk from flooding**

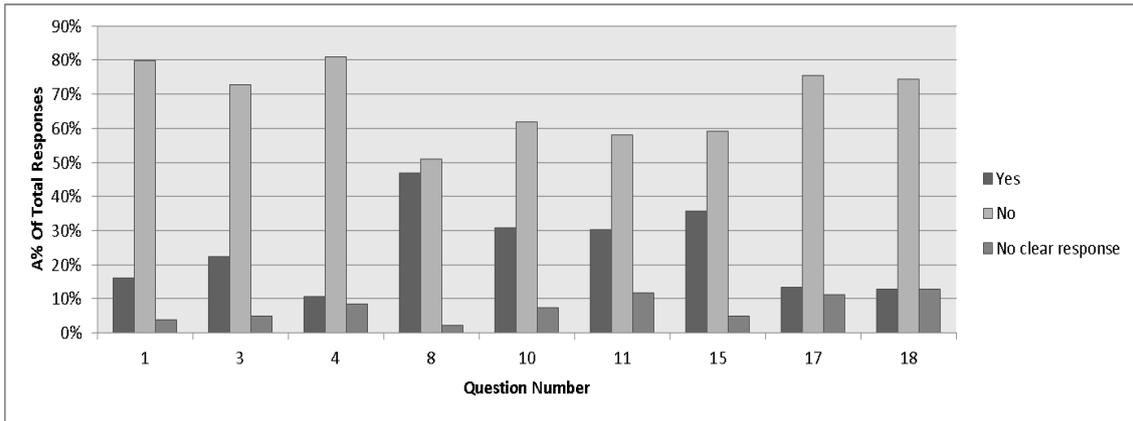
Turning to the three case study population centres Chapter 4 revealed that when visiting the case study areas as part of the field observation activity, the author had difficulty distinguishing the location of the population using physical markers in the community environment. However, flood risk maps produced by the Environment Agency were useful in identifying the “boundary” for the study community.

Using a questionnaire survey, the author was able to develop a deeper understanding of the populations in the study areas, but in order to improve the effectiveness of the survey, the area to be investigated was sub-divided using a land use classification system (ODPM 2006). The land use classification system enabled

the author to create an instant breakdown of the community structure. That, in turn, allowed the survey to be tailored to better address the diversity of the populations in each case study area (explained in Chapter 3).

Where the traditional community perspective was less useful, was in dealing with the disaffected, thin and fragmented elements of the communities. The thin nature of the flood risk community was alluded-to in the paragraph above, specifically the lack of clear evidence in the physical environment of the community's existence. Within the sample populations, the author was hard pressed to gain any consistent acknowledgement of a community at risk from flooding (Figure 5.1 and Table 5.1 below).

The lack of any consistent acknowledgement by the survey respondents of their affiliation to a community at risk from flooding was signified by high levels of "no" or "don't know" responses to questions about flooding (Figure 5.1 and Table 5.1). Based on a purely traditional approach, the author might be forced to place such respondents outside the "community", but, as Marsh and Buckle (2001) found in communities shaped by a particular hazard, it is not uncommon to find elements of the community that are in denial of their membership, or are actively opposed to being ascribed membership.



**Figure 5.1 Distribution of responses to questions testing affiliation to the flood risk community**

(Source: Author)

**Table 5.1 Responses to questions testing affiliation to the flood risk community**

(Source: Author)

Q	Question narrative	Responses			
		Yes	No	No clear response	Total
1	Have you ever been a victim of a crisis event such as a flood?	29	143	7	179
3	Have you ever spent time reflecting on what lessons could be learned from experiences of crisis events such as flooding?	40	130	9	179
4	Have you ever changed your thinking or behaviour as a result of your experience of a crisis event such as a flood?	19	145	15	179
8	Do you know when the local community last experienced a flood?	84	91	4	179
10	Do you know if the local community has ever spent time reflecting on the lessons to be learned from their experience of crisis events, such as a flood?	55	110	13	178
11	Do you know if the local community has ever changed its thinking or behaviour as a result of crisis event, such as a flood?	54	104	21	179
15	Within the local community there are a number of businesses and other organisations; do you know if any of these have ever been victims of a flood?	64	106	9	179
17	Do you know if local businesses and organisations ever spent time reflecting on the lessons learned from crisis events, such as a flood?	24	135	20	179
18	Do you know if local businesses and organisations ever changed their thinking or behaviour as a result of a crisis incident, such as a flood, in the local community?	23	133	23	179

So, in the case study communities the traditional definition of the community concept acted as a springboard from which to launch a deeper investigation using a more modern version of the concept. In this research, the traditional and modern

definitions are not an either/or option, rather they are markers of the steps along which the research progresses, starting from a traditional base and progressing into a more modern “academic” analysis.

#### **5.2.4 The traditional community concept and FRM institutions**

Previous research has shown that institutions often hold strongly to a traditional view of communities (Marsh and Buckle 2001, Gottdeiner and Budd 2005, Bauman 2001). The conclusion for most authors was that institutions were under pressure to simplify how they defined a community in order to better target their limited resources.

Interview evidence gathered for this research correlated well with such a belief.

The interviews conducted with institutional personnel confirmed that FRM institutions were using very simplified definition of a community, often as a consequence of limited resources:

*“I [District Emergency Planner] do not have the time to engage with every group in the community. I only engage when the community approaches us – not the other way around.” (Interview 01)*

The interviews also suggested that, beyond the community level, FRM institutions were hard pressed, or possibly disinterested, in acquiring a detailed understanding of the local community. For many, the simple identification of “a” community seemed to suffice:

*“I [County Flood Risk Officer] have listed the priority communities and I stopped counting at 150. Shaldon is quite far down the list due to the low number of properties at risk. Teignmouth is third on the list and Newton Abbot is also quite high... I have been involved with parish councillors, but I can't do that for every incident. We did send all parish councils a survey questionnaire, but did not get a good response. We are trying to reach out to the parish level, but that is about as low as we go.... We do not meet very often. We would not talk to them unless they come to us with an issue.” (Interview 04)*

A justification for not probing too deeply into a community was provided by one community level institution:

*“There are many contrary views so knowing who to liaise with is tricky. The main difficulty we [Parish Council] face is that groups think we have more power than we actually have in relation to money, planning and control of development. We have to actively promote the views of the groups which may also be a challenge.” (Interview 02)*

The suggestion from these data is that FRM institutions do not just adopt a simplified definition of communities; they actively avoid developing a “too detailed” or “academic” understanding. The suggestion is that a more detailed understanding of a community leads to greater difficulty in deciding how best to deploy limited resources.

### **5.2.5 Lessons learned**

For this research, the traditional community concept proved useful in providing a springboard from which to launch a more detailed “academic” investigation. The level of detail required for an academic study demands an understanding of communities that goes beyond the traditional perspective. However, the academic viewpoint is not a replacement for the traditional perspective, merely an augmentation.

Institutions seem not to need or desire the academic augmentation of the community concept. Data from this research suggests that the added complexity revealed by an academic study may introduce complications for institutional decision-makers.

Institutions may simply need to know of the existence of a community, not its inner workings. If a more detailed understanding is needed, then institutions wait for the community to come forward and reveal the required detail, rather than pro-actively

seeking it for themselves. The concern for institutions is in knowing whether or not to trust the data collected. So, if the community lobbies the institution, the problem of selecting trustworthy sources is circumvented.

For this thesis, the insight gained about FRM institutions' attitude towards academic or traditional approaches to understanding communities is helpful. When developing proposals to enhance community resilience using community-institution links, the author must be mindful not to over complicate the decision-making process for institutions. Highlighting problem areas and suggesting appropriate parties with whom to liaise may be all that institutions desire, not a detailed analysis of community structures.

### **5.3 Community engineering and community-institution congealing to address flood risk issues**

#### **5.3.1 Introduction**

When introducing this chapter, the author pointed to previous research, which found that some communities are being forced to take on roles more commonly associated with the state. Specifically, Delanty (2003) suggested that the “community” has been placed at the heart of modern politics, adding that, in this new role, local community institutions may be placed in tension with the local society they serve. Delanty was building on what Crow & Allen (1994) found, namely that communities are often subject to “engineering” and control by government agencies. The findings by Delanty (2003) and Crow and Allen (1994) would suggest that communities should take an active role in political processes, to avoid any unwelcome coercion.

Evidence of institutions wanting to “engineer” communities and engage them in a

process designed to address the local flood risk was found in data collected in this research. This section will analyse that data to assess its impact in relation to community resilience, but first this section addresses an issue raised by Hill (2000). For Hill (2000), actions to engineer communities may be more effective if some form of congealing between communities and institutions takes place. The idea of community-institution congealing fits well with the aims of this research, but is not well developed in the academic literature, so this section will explore its significance in more detail.

### 5.3.2 Evidence of community-institution congealing in the case study areas

The observational studies conducted as part of this research revealed how all three case study communities had congealed with a variety of institutions. For the most part, the congealing was evidenced by the presence of retail institutions situated amongst residential areas in each community (see Table 5.2 and Figure 5.2 below).

**Table 5.2 Blending of institutions in residential populations of the case study sites**

(Source: Author)

Code	Land use classification	NA	TM	SH
4	Recreation	8	4	5
5	Transport	3	3	1
6	Utilities and infrastructure	2	1	2
7	Residential	410	206	347
8	Community services	6	5	11
9	Retail	41	241	22
10	Industrial	3	19	2
11	Unused land	4	0	7
	Total	477	479	397

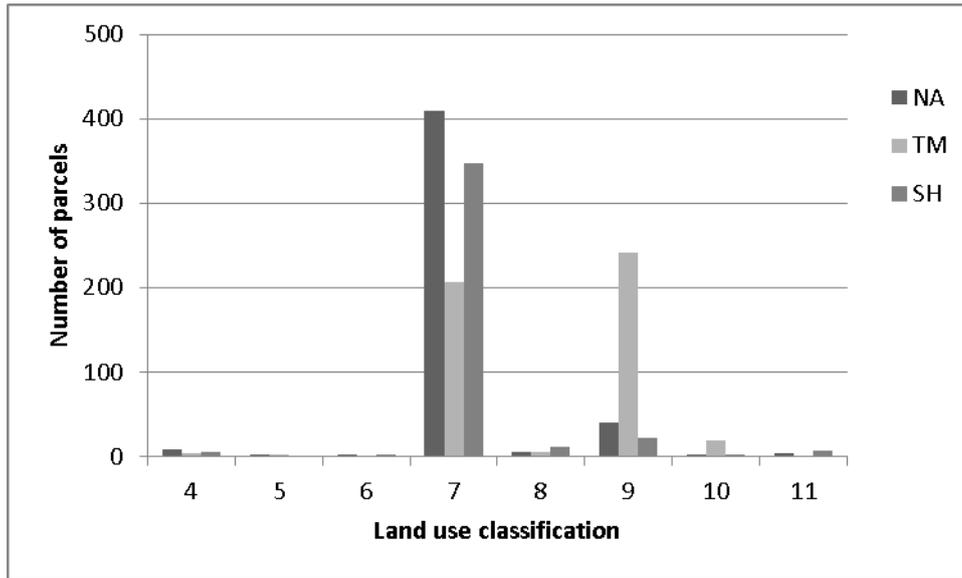


Figure 5.2 Frequency distribution of institutions and resident populations in case study sites

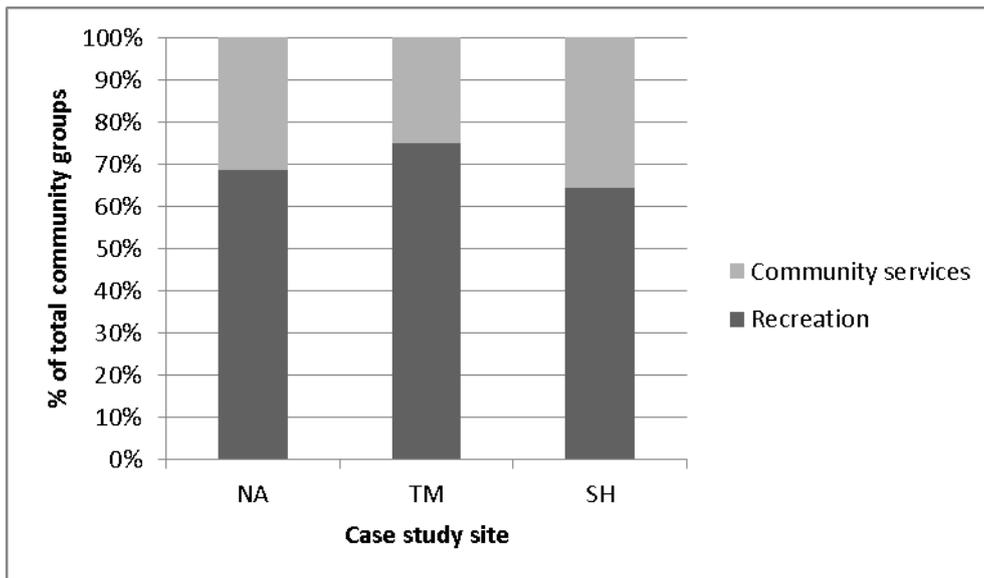
(Source: Author)

Digging deeper into the three case study communities, the questionnaire survey identified a number of “imagined” institutions (Anderson 1983), not all immediately obvious to an observer (see Table 5.3 and Figure 5.3 below). These institutions were often objects created by the community, or in the context of this analysis the community congealed around them rather than the institution congealing around the community.

Table 5.3 Breakdown of community groups in case study sites

(Source: Author)

Code	Land use classification	NA	TM	SH
4	Recreation	26	36	29
8	Community services	12	12	16
	Total	38	48	45



**Figure 5.3 Relative split between types of community groups in case study sites**

**(Source: Author)**

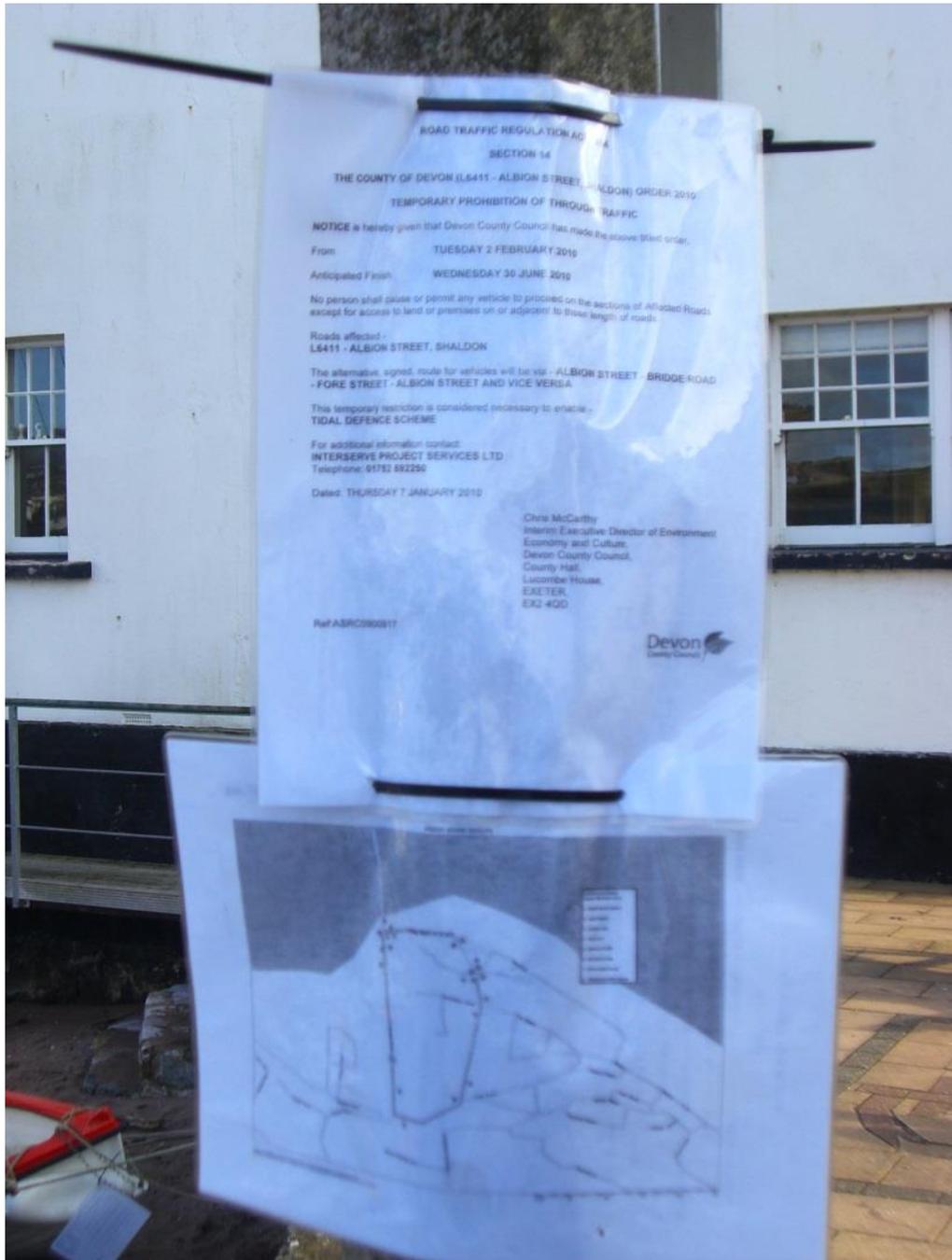
The author would make a distinction here between institutions in the community that are partially institutionalised (sports clubs and hobby groups etc.) and fully institutionalised (businesses, industries, local councils and community service organisations like schools etc.). In the observation study conducted for this research, it seemed that the first group had evolved from within the community, but the second group had positioned itself in the community.

Broadly then, uninstitutionalised or partially institutionalised objects may be defined as being manifest by the community congealing around them, whereas fully institutionalised objects are often found congealing with the community. In other words, when a group becomes fully institutionalised, it has to make a conscious decision as to where to locate itself – often in a community. For uninstitutionalised or partially institutionalised objects, such a decision is less formal and its location is less clear. The existence of an uninstitutionalised or partially institutionalised object in a

community is thus determined simply by evidence of individuals with membership to such institutions existing in the community.

### **5.3.3 Two case studies of community engineering to address a local flood risk**

Taking the point made in the latter part of the last paragraph, the author suggests that the main issue at the heart of understanding how community engineering takes place is to understand the degree of congealing needed between the community and the institution(s). In this research, evidence of engagement by FRM institutions with the case study communities was limited to two of the three locations. Specifically, at the start of this research only Shaldon exhibited an active programme of community based engineering to address local flood risk (Figure 5.4).



**Figure 5.4 Evidence of action in Shaldon Community to address flood risk in 2010**

**(Source: Author)**

By 2012 the Teignmouth community had also engaged in a project “engineered” by the state to protect Teignmouth residents from a future flood event (see before and after photos in Figures 5.5 and 5.6 below).



**Figure 5.5 Evidence of flood risk in Teignmouth, in 2010**

**(Source: Author)**



**Figure 5.6 Evidence of action in Teignmouth to address flood risk, in 2012**

**(Source: Author)**

The Teignmouth example was enacted sometime after the data collection activity for this project was completed, but importantly for this research, the methodology adopted for engaging the community was based on experience gained in Shaldon.

Interestingly, the approach adopted by the EA in Shaldon was triggered by an experience the EA had in Teignmouth in 2004, described by interview participants as follows:

Teignmouth (in 2004):

- The EA assessed the chance of tidal flooding in Teignmouth to be high and developed a scheme to protect the community.
- The EA presented their proposals to the community.
- The community rejected the proposals and the scheme was shelved.

(Source: Interviews 1 & 2)

The Teignmouth approach may be described as one where the state was fulfilling its function and the community had little input into the process other than to accept or reject the outcome of the state's decision-making process. In this process, there is very little congealing by the institution with the community.

When approaching Shaldon (whose community was subject to a similar flood risk), the EA adopted a very different approach:

Shaldon (in 2008):

- The EA explained the problem to the community and invited suggestions for acceptable solutions to mitigate the flood risk.
- The EA took the community suggestions and designed a scheme to protect the community that was aligned to community views.
- The community accepted the proposal and the scheme was implemented

(Source: Interviews 1 & 2)

The distinction between the two approaches is significant in two ways. First is the extent to which the FRM institutions moved closer to the community (congealing with the community). Second was the effect this congealing had on the community (it congealed around a local institution). The process of congealing allowed the community to play a more significant role in deciding what was needed to protect the community. To some extent, the community was brought into the decision-making process at a much earlier stage, a stage normally the domain of the state. Of course, community participation in development planning has been part of the state operated planning system for a long time (public enquiries for new development projects, the planning application process, etc.) and, as such, the issue of institutions needing to congeal with communities based on the level of participation expected is relatively well understood. To the author, what is important (and less well understood) is what the community has to do to fulfil its role. In Shaldon, the community congealed around the local parish council:

*“There is always a space on meeting agendas for public comment. Minutes are posted on the website and on the local parish notice board... We have an annual parish council meeting where members of the public are invited. Public can also attend our monthly meetings... Working parties do much of the contact work...we can set up a working party if necessary to deal with extra issues...2-3 working parties on the go at any one time. The flood issue was one such working party...We worked closely with TDC, EA and the flood defence scheme contractor Interserve... EA did most of the technical liaison and they have been very good. At the early stage the EA appointed an independent liaison person and that was very good. They did this after “balls up” at Teignmouth.” Parish Councillor (Interview 02)*

The Parish Council set up a working party and coordinated meetings between the community and the EA. The Council worked to ensure that the voice of the community was effectively heard by the EA. In Shaldon, the EA also operated

slightly differently to support (and take advantage of) the congealing action of the local community, specifically the EA appointing a “community liaison officer”. The community liaison officer worked closely with the emergency planner based at the district council.

*“I started with [community liaison officer] in Shaldon in 2007, as they were the most vulnerable. The EA has a very good approach to dealing with communities - Rather than say we have a plan, they say “do you think it’s a good idea that we have a plan?”. They went to Teignmouth first and they said NO to the plan and the EA was surprised, so Shaldon they did it differently.”  
District Emergency Planner (Interview 01)*

In this example, a number of FRM institutions and role institutions are revealed as playing an important part in addressing local flood risk issues by managing and facilitating congealing actions and community engineering the national level EA, the district council TDC, the town/parish council, the emergency planner, the local councillor, the community liaison officer.

### **5.3.4 An important lesson about community engineering and community resilience**

Stepping back from the local level, the congealing effect derived from community engineering efforts was well recognised at regional level. At regional level, FRM institutions viewed such congealing in a positive light when it came to promoting community resilience. However, the experience of regional level institutions revealed also that the congealing effects are not uniformly successful. In particular it seems that congealing within local communities is less effective as the community increases in size:

*“It is easier to deal with villages than it is to deal with town and cities – where it is harder to build community resilience because there is no focus on who to go to, they are all disparate groups. It is easier in the smaller parishes because the parish council can bring everybody together. Whereas in the city where the city council is sitting over everybody but all the wards and councillors are disparate groups and it is hard to bring those areas together. The larger the community gets the less understanding of the risks there is and also because there is always a resource available to deal with incidents there is less understanding of the community resilience side.” Regional Emergency Planner (Interview 05)*

In addition, the regional level experience pointed to the need, when working to build community resilience, of a community liaison role.

*“We can get access at any time through our community officers but I have constraints because it is only part of my role”. Regional Emergency Planner (Interview 05)*

However, the experience at regional level also raises a point of caution when engaging the community to take on some of the responsibility of the state:

*“Managing their expectations and managing their responsibilities – not going beyond their capabilities. We do not give them power, but we want them to look after themselves – we want enthusiasm, but not too much. We try to protect them from themselves. If they are highly qualified, we will direct them on to others where they can help and get further approved and recognised training – like Devon & Cornwall 4x4 rescue service. Expectation management is the key.” Regional Emergency Planner (Interview 05)*

The last point raises an important issue in relation to promoting resilience in communities, namely that the state is happy for communities to become more resilient, but not “over resilient”. The issue of “over resilience” will be covered in more detail in Chapter 7.

### **5.3.5 Lesson learned**

What this section reveals is that communities are indeed drawn further into areas traditionally occupied by the state. When drawn in, both state institutions and communities must adapt their operating systems in order to engage effectively. The Shaldon example suggests that the community benefits by congealing around a local representative institution to facilitate interactions between the community and the state institution. But, the state institution also needs to congeal with the community, in order to share its expertise and resources in the development of solutions to problems. This process creates the need for a new role (the community liaison officer) to assist in developing a shared understanding of problem issues from both the community and state institution perspectives. These are all important lessons for this thesis, as it builds an understanding of process needed to improve community resilience.

## **5.4 Stratification and elites in communities**

### **5.4.1 Section outline**

At the beginning of this chapter, the author suggested that many researchers have found communities to be dominated by political and economic elites. These elites determine policies and define the goals and values of the communities (Anderson 1983, Bell and Newby 1971, Crow and Allen 1994, Hill 2000). This section will further examine that finding, to see if there is evidence of elite groups being active within the case study communities. This section will also assess if it is possible that modern patterns of community membership have diffused the traditional community

boundaries and evaluate if power structures are being altered as a consequence. The evaluation associated with the latter point will specifically focus on assessing the possible consequences for the resilience of the overall community.

#### **5.4.2 Segregation, stratification and the business elite engagement in FRM**

Chapter 4 explored the issue of coercion and resistance to coercion within the FRM framework. That exploration found coercion and resistance to be common occurrences within the institutional framework and the author concluded that some hierarchy, or stratification, was needed for these practices to function. Further to that, in the last section of this chapter, the author identified that the communities in Shaldon and Teignmouth have been coerced into action to address a local flood risk problem. In Shaldon, the coercion resulted in the community coalescing around the parish council. Now, the author will assess how community segregation impacts on efforts to address local flood risk.

By way of a reminder of previous research, Bell & Newby (1971) identified that communities are not flat, with benefits of membership shared equally by all; they do in reality possess power structures and hierarchies. To Hill (2000), hierarchies are exemplified by the existence of political and economic elites. Those elites can coerce the broader community into accepting the elite's own specific policies, goals and values. Such hierarchical community structures are often portrayed in a negative light, as with Crow & Allen (1994) who blamed hierarchies for practices that resulted in the exclusion of some individuals in communities from the benefits shared by others in the community. It is perhaps these negative outcomes that led Anderson (1983) to his finding that modern political elites are tending to favour flat community structures, so they can more easily ensure that benefits are spread equal to all.

However, flat structures may have negative consequences, caused by the removal of hierarchical systems that effectively drive the coercive-resistive relationship between elites and communities they influence. That drive is necessary to motivate the community to engage with FRM activities.

As already noted in Chapter 4, there was little documentary evidence of hierarchies or elites at work in the case study communities. In addition, observational studies did not identify any obvious hierarchical stratification in the communities. The observation study did identify areas where different grouping clustered together and the author was able to segregate these areas using the land use classification system. Figure 5.7 shows the output from the segregation exercise in the Teignmouth case study community (other maps available in Appendix II).

Across all three case study communities, the segregation of the community was dominated by two land use classifications – commercial retail and residential. Two other classifications were common to all three case study communities, but much less numerous, namely; community service organisations and industrial organisations (see Figure 5.2 above). The exercise of mapping the segregation of the communities was the starting point to building evidence of stratification.

Evidence from the questionnaire survey suggested that the retail and industrial sectors (business elite strata) were not highly engaged in community based activity. Importantly, the business elite had very little engagement with efforts to exert influence over the beliefs, values and actions of the community when addressing the local flood risk (see Table 5.4 and Figure 5.8 below). The evidence also suggested that the retail and industrial strata possessed a highly isolationist position in the community. Individually, the business elite were almost entirely disassociated from

the community (Figure 5.9). Local business institutions deferred to trade associations as a means of exert influence over FRM issues in the community. With regard to the latter point, there was little evidence in the data gathered for this research of the trade association engaging in FRM issues.

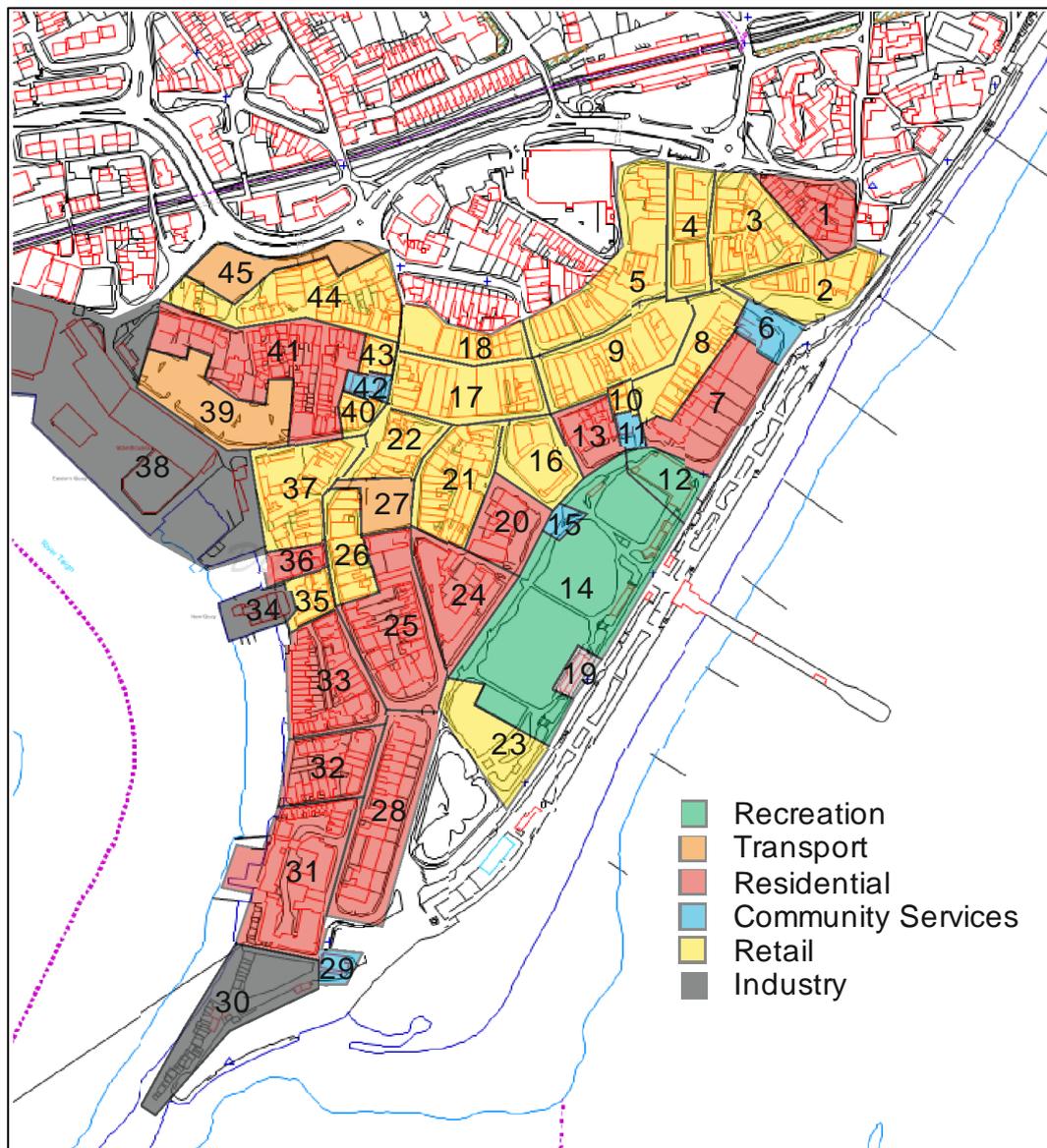


Figure 5.7 Evidence of segregation within Teignmouth case study community

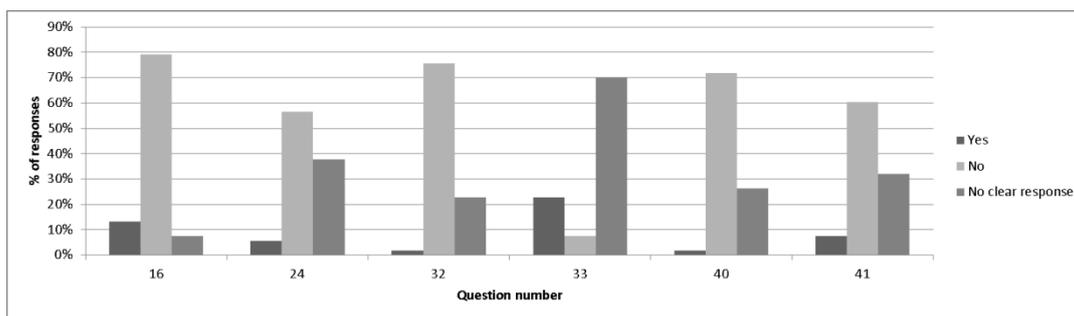
(Source: Adapted from Digimap by Author)

This analysis is interesting, as the flood hazard is a great leveller in that it affects all members of the community equally. Additionally, a flood is an event that cannot easily be solved by individual action and needs work at a collective level to be effective. The fact that the business elite could recognise the threat, but choose to remain isolated from collective community action, was interesting for this research. It suggests that the respondents either did not perceive the benefits of collective action or they trusted that the trade association was engaging effectively on their behalf. The lack of engagement by the business elite, either individually or collectively, in FRM issues is an area where the author sees potential for development (Chapters 6 and 7 will explore that potential in greater detail).

**Table 5.4 Evidence of institutional engagement with flood risk issue in case study communities**

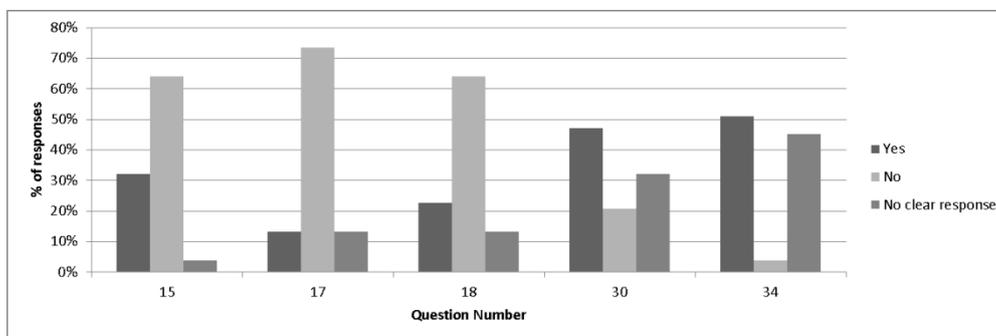
(Source: Author)

Q	Question narrative	Yes	No	No clear response	Total
15	Within the local community there are a number of businesses and other organisations; do you know if any of these have ever been victims of a flood?	17	34	2	53
16	Do you know if any of the businesses and organisations based in the local community ever provided assistance to victims of a flood	7	42	4	53
17	Do you know if local businesses and organisations ever spent time reflecting on the lessons learned from crisis events, such as a flood?	7	39	7	53
18	Do you know if local businesses and organisations ever changed their thinking or behaviour as a result of a crisis incident, such as a flood, in the local community?	12	34	7	53
24	Do you know if any of the social networks that you are a member of have a role created specifically to deal with flooding issues?	3	30	20	53
30	Within the community there numerous businesses and other organisations, can you identify the local businesses/organisations that are most at risk from a flood?	25	11	17	53
32	Do you know if any of the local businesses/organisations have a role created specifically to deal with flooding issues	1	40	12	53
33	If the local community was the victim of a flood, do you consider that local businesses/organisations would be able to provide help to the flood victims?	12	4	37	53
34	If you were the victim of a flood, what capital resources do you have to help you recover from the crisis?	27	2	24	53
40	Are you aware of any resources that local businesses/organisations may have and that may help the community recover from a flood event?	1	38	14	53
41	Do you know if any local businesses/organisations have plans to acquire more resources that would help to protect the community from the risk of flooding?	4	32	17	53



**Figure 5.8 Organisational responses to questions about helping the community address flood risk issues**

(Source: Author)



**Figure 5.9 Organisational responses to questions relating to self-protection from flood risk**

(Source: Author)

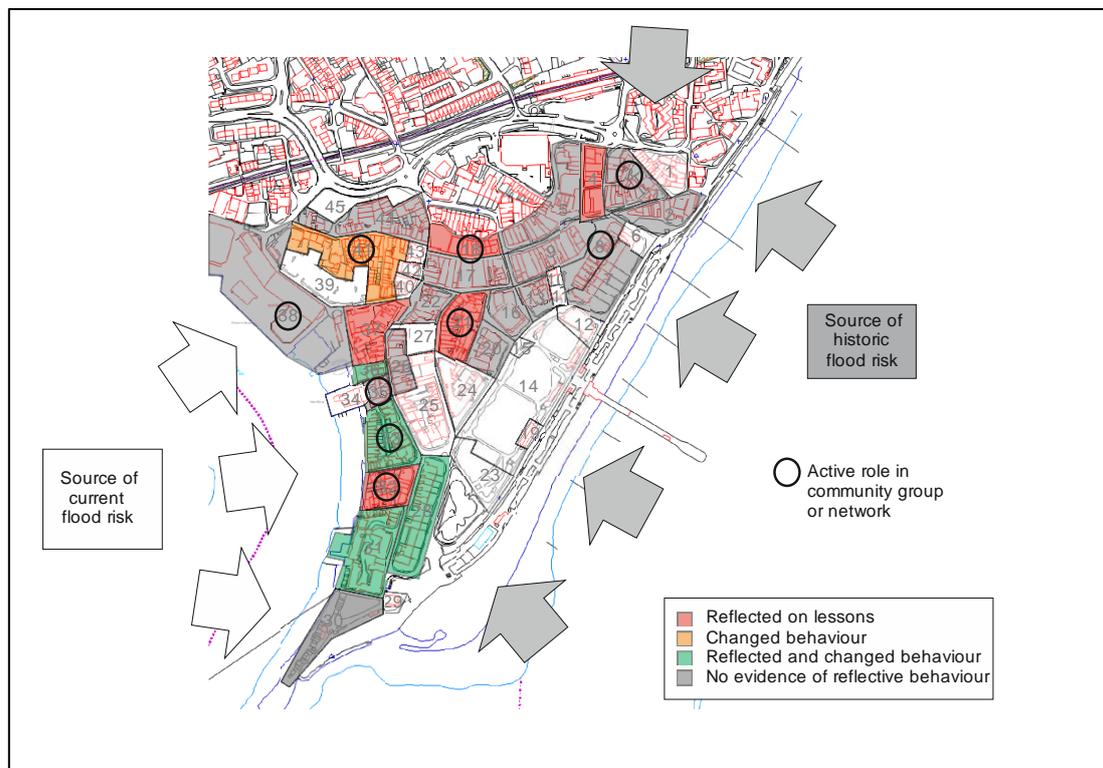
### 5.4.3 Stratification and active elites in the case study communities

Generally within the overall survey sample, some stratification did become evident in relation to the local flood risk. Perhaps not surprisingly, stratification seems to relate to “proximity” to the source of the hazard, i.e. residents close to the source of flooding demonstrated a greater willingness to change their behaviour in response to the flood risk.

In the case of Teignmouth community, a stratum of members willing and wanting to take action to address flood risk lacked support from the greater part of the overall

community in the flood risk area. Figure 5.10 helps to illustrate how that lack of support came about. Specifically, evidence of individuals who had reflected on the flood hazard and changed their behaviour as a consequence of that reflection was limited to areas directly adjacent to the source of the current flood risk.

In areas of historic flood risk, there was evidence of the community reflecting on lessons to be learned from local flood events or changing behaviour as a consequence of that reflection, but not both. Overall, the discontinuities between the reflective and behavioural data pointed to a community where a large stratum is focussed on their individual flood risk needs and are not engaged in work orientated to the “collective good”. The lack of focus on actions to the collective good is a negative factor in building community resilience (explored further in Chapter 7).

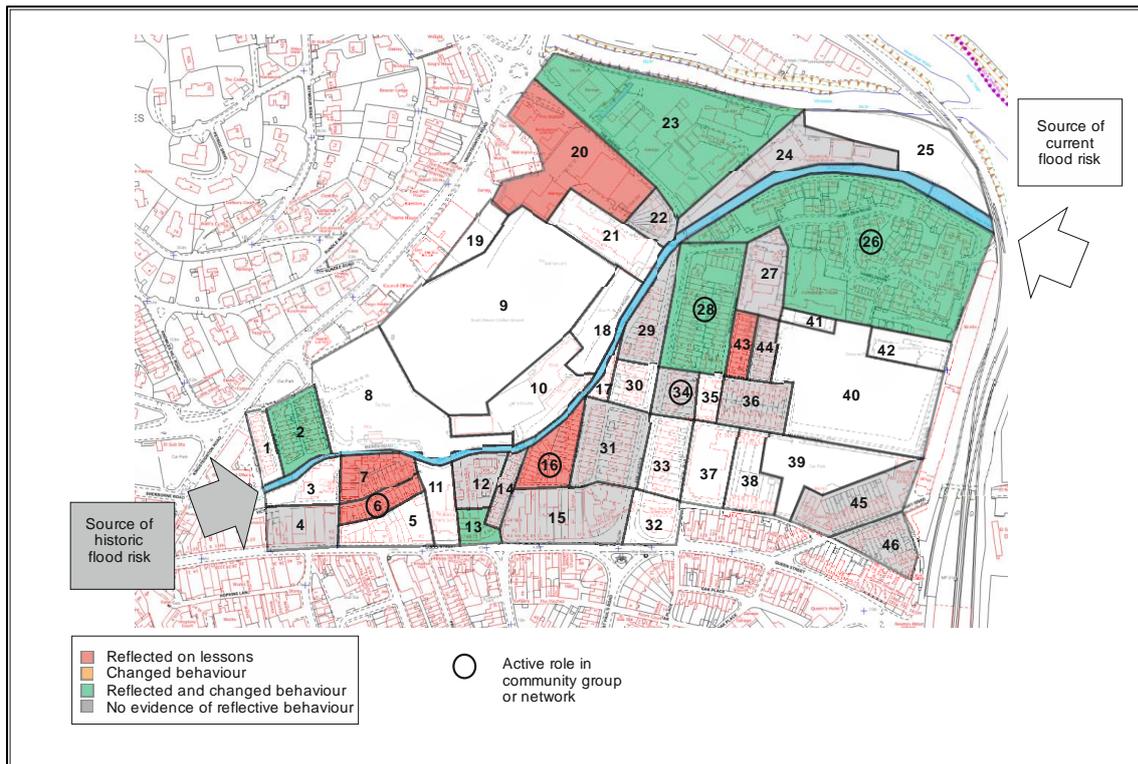


**Figure 5.10 Stratification of community based on evidence of changing behaviours in response to the threat of flooding (Teignmouth example)**

(Source: Author)

Figure 5.10 also indicates the presence of an “active elite” stratum, who indicated that they occupied formal roles in community groups and networks. This active stratum was not very evident in work to address the local flood risk and the figure provides some evidence to help explain why this may have happened in the Teignmouth case study. In the figure 50% of the active stratum is situated in areas where there is little evidence of community members either reflecting on lessons to be learned from flood incidents or demonstrating any change in behaviour in response to the threat of flooding.

In Newton Abbot, the divide was equally stark (Figure 5.11), with evidence of strata within the community including individuals who had reflected upon or changed behaviour due to the flood risk. Those individuals were located close to the historic and current sources of flood risk. Although the majority of the “active elite” in Newton Abbot were based in areas that included these strata, overall the elite was the least numerous of the three study communities. The consequence for Newton Abbot is that the active elite may be largely united on pushing forward issues to address the local flood risk, but they lack representation in many of the areas, so their influence is limited.

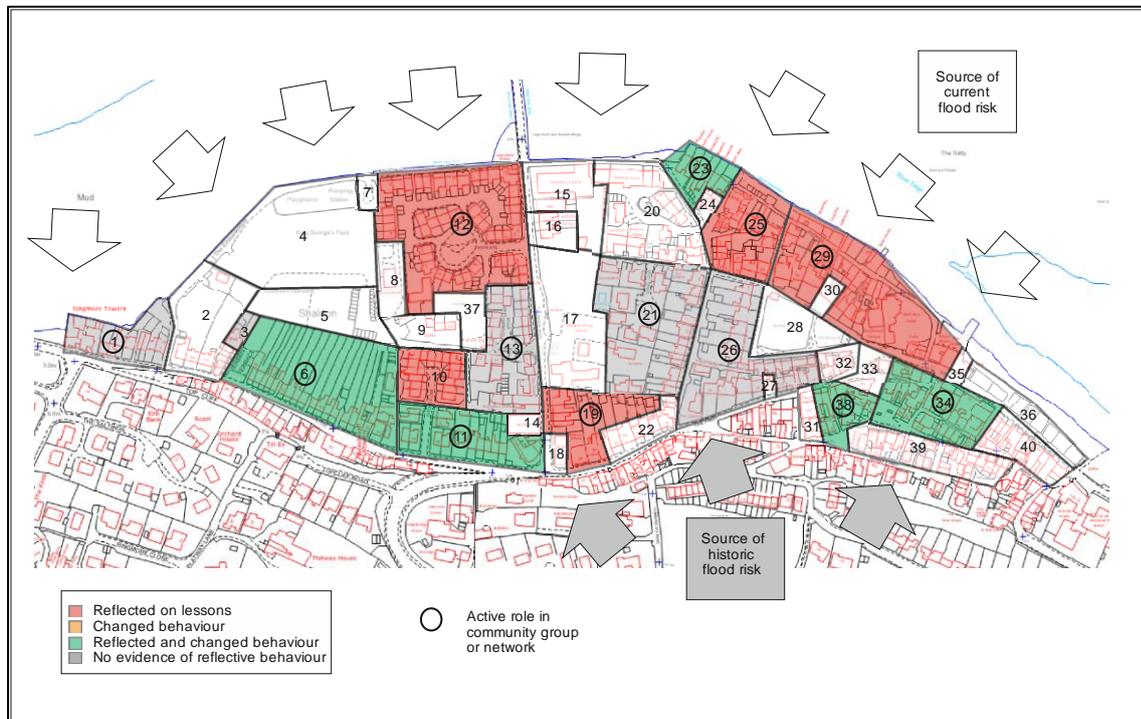


**Figure 5.11 Stratification of community based on evidence of changing behaviours in response to the threat of flooding (Newton Abbot example)**

(Source: Author)

The Shaldon case study was more complex (Figure 5.12). In Shaldon, the boundary of the current and historic flood risk was more extensive and most of the segregated areas bordered one or other boundary. Interestingly, in Shaldon, the population in areas exposed to the historic flood risk were most likely to have reflected upon and changed their behaviour in response to the flood risk. By contrast, in areas adjacent to the current flood risk, the population was most likely to have only reflected, but not changed their behaviour. The Shaldon community had the largest “active elite” and most of the elite were in areas that demonstrated some positive reflection or behavioural change in relation to the issue of flood risk. For Shaldon, the author’s

assessment is that the active elite had the potential to positively engage the community in order to address the local flood risk.



**Figure 5.12 Stratification of community based on evidence of changing behaviours in response to the threat of flooding (Shaldon example)**

(Source: Author)

#### 5.4.4 A lack of engagement by the local “active elite” in FRM issues

Interviews conducted for this research shed light onto the possible reasons for the active elite being less evident in the flood risk management process. Interviewees from organisations responsible for managing flood risk were asked about their engagement with community groups and several interviewees pointed to concerns about working with such groups:

*“By and large it is easier to work with organisations, but occasionally we have to work with individuals, say by public meetings ... There are many contrary views so knowing who to liaise with is tricky. The main difficulty we face is that groups think we have more power than we actually have in relation to money, planning and control of development. We have to actively promote the views of the groups which may also be a challenge... They [community groups] are essential to ensure the community remains active and vibrant. By dealing with groups we can tap into their knowledge, identify issues and problems and then we can address them. They also provide volunteers.” Parish Council (interview 2)*

In this case, the concerns surrounded the extent to which any particular group was representative of the entire community and the logistical challenges in organising meetings with formalised groups:

*There are too many groups and this is a problem as they all have different agendas. It would be much simpler if there were fewer groups, as it would be much simpler to understand who belongs to them, what their purpose is and how often they meet... I think separate groupings are important; a separate business group and community group because they do have different interests... meetings are intended to deliver a specific message, but the challenge is often about how you get them there and when you get them there, so it is about the formation of the group... logistics is key.” Town Council (Interview 3)*

In addition, groups were seen as promoting their own narrow interest and were less inclined to engage in issues outside their specific remit:

*“We do not actively seek to engage with them [community groups], but if they come to us we are happy to help – they have to be motivated... If a group was motivated it makes it easier for us and them to plan, to prepare and to respond.” District Council (interview 1)*

*“Some communities have groups set up specifically to deal with flood issues, but we have not had much dealing at that level, it is quite difficult to get in touch with them. Usually they get in touch with us... All they want to know is who is at fault and who is going to fix things.” County Council (interview 4)*

The good thing about organised groups is that they do provide an easy entry point to the community. The larger the community group, the more potential there is for flood risk management institutions to get access to the entire community:

*“They [the community groups] provide the focus to give information and to get information. Also they present a chance to meet with people [the local active elite] with some understanding rather than no understanding of what to do and how to deal with it. They also provide a means by which we can draw a bigger group together. Regional Emergency Planner (Interview 5)*

But FRM institutions seemed reluctant to negotiate with the elites that govern the community groups. This suggests that negotiation with the community elite that represent local groups may not be the aim of the FRM institutions.

In the Shaldon flood risk example, when the community coalesced around the one local institution that genuinely represented the entire community (the parish council), FRM institutions were more willing to engage with the elite that represented the parish council. So, the lesson for this research is that for the community elite to engage effectively with FRM institutions, it is important that they can demonstrate a genuine and impartial role in representing the entire community. However, the role of the local elite is not to negotiate on behalf of the community, but to facilitate engagement by the state institution with the community.

Interestingly, and of importance for this research, the process of engagement simply resulted in a proposal that still had to undergo the “planning approval process”. The planning process used to approve the Shaldon flood defence scheme was routine, so the main result from the community engagement exercise was that opposition to the planning application was minimised and the flood defence plan was approved. In this respect the established elites that control the planning process (representatives

of the three policy networks) still had an important role in the final decision about community actions to address the local flood risk.

#### **5.4.5 Lessons learned**

It seems then that elites and hierarchies do exist in communities, but they are not necessarily always motivated to work to the collective good and the FRM institutions are well aware of this. That being said, for actions to happen in addressing the flood risk, FRM institutions need a body to negotiate with. That body needs to include elites that genuinely represent the entire community.

Engagement with lesser groups, no matter how powerful, is shunned due to the bias they may have. For an external institution, having a single and legitimised entity with which to negotiate is better than having multiple entities. In the Shaldon case, the legitimacy came from the political nature of the parish council. Political bodies have the elected officials with the power to coerce the community into accepting a negotiated solution (more so than the economic or business elites, or the special interest group elite).

Linking back to earlier discussions on policy networks, actions within the community may have been driven by representatives from the civil contingency planning policy network, so it was interesting to note that in the Shaldon case study that the institutions at the heart of the negotiation process were engaged in all three policy networks (EA, district council and parish council). It is also interesting that the decision on what action to take in relation to the local flood risk in Shaldon had to go through a process where all three policy networks had an input. Hence, the powerful influence of the civil contingency elite was limited by the decision-making system.

It is possible that this narrative has revealed a paradox that may be inherent in the flood risk management system. Namely, that governing institutions in the FRM framework are concerned about equal distribution of benefits to flood risk communities and, with their nostalgic view of communities as places where benefits are shared equally, they wish to model the management framework itself on this “imagined” social form. But, the reality is that communities are just as complex and hierarchical as the state, so the transformation to community based governance does not remove inequality. What the transformation does is shift the focus of public attention away from national institutions to more local institutions. The shift in focus may be viewed positively by the national elites, but it is not welcomed by local elites.

## **5.5 Diffusing power structures in communities by extending social networks**

### **5.5.1 Section outline**

The last section introduced the idea of an “active elite” in the case study communities. The expectation was that this research would reveal elites in each case study communities playing a visible role in collective actions to manage the local flood risk. However, the evidence was not very conclusive and the author proposed that the lack of a “visible elite” may have been due to the challenges institutions encounter when dealing with community groups. In this section, the author will explore another possibility; one based on the changing nature of community networks. Specifically, this section will assess the significance of assertions made by previous community researchers (Amit 2002, Anderson 1983, Crow and Allen 1994, Day 2006, Delanty 2003, Marsh and Buckle 2001) that the

changing nature of modern communities may have some role in diffusing the power of the traditional elites, making them less relevant to external institutions.

### **5.5.2 Theoretical issues relating to community power structures**

To Day (2006), the traditional community is one where the network to which each individual in the community becomes a member is largely determined at birth.

However, Delanty (2003) found that modernity is tending to destroy traditional forms of community, which are then re-manifesting in new “abstract” networks that lack visibility. For Marsh and Buckle (2001), such changes should not be viewed as unusual, because communities have never been passive and never changing.

Anderson (1983) was also able to see these changes, describing communities in the latter part of the twentieth century as indefinitely stretchable networks. Crow and Allan (1994) also surmised that the ease of mobility in the modern world has challenged traditional notions of communities. So, if community members are increasingly associating themselves with networks stretching beyond the traditional “spatially bound” community border, then this research conceives that it is likely that traditional community elites will have less influence over community members.

Perhaps Amit (2002) was also correct by asserting that the term “community” has lost most of its traditional potency and is now only of value in describing a social collective, with no hint of shared values and governing structures. Certainly, for Hill (2000), the term community now confers a false sense of cohesiveness on modern day human collectives. It is possible that Delanty (2003) was also correct when suggesting that membership of a modern community is manifest as simply as by engaging in communication with other “members” who choose to situate themselves within such symbolic and “imagined” communities. The implication for this analysis is

that the author would find individuals in each case study community with an identity that is a construct of intersecting commitments to several other communities.

Added to the latter point in the last paragraph is that individuals may be found adopting completely different identities in each of the communities to which they have a commitment (Day 2006). In today's world, with a considerable part of many people's lives played out on the internet, Day's ideas are not as unthinkable as they may have been in the past. The issue for this research is to know to what extent this manifestation has become evident in the study communities. In addition, if it has become manifest in the communities; to what extent may this pattern of behaviour be linked to the "less evident" community elite in the flood risk management process?

To summarise then, in this section, the author will explore three specific issues. First is to explore the issue of traditional community elites having less influence over the community members, due to community members increasingly associating themselves with networks that are not constrained by traditional community boundaries. Second is to assess the extent to which the identities associated with traditional elites contrast against identities derived from modern community associations. Third is to know to what extent these patterns of behaviour are linked to the "less evident" community elite in the flood risk management process?

### **5.5.3 The FRM institutional community elites and new boundaries**

Analysis of FRM policy documents revealed an institutional community network that grew significantly in complexity the further it stretched from the case study communities (see Figure 4.11 in Chapter 4). Within the FRM policy framework the National level institutions stand out as the ones that act as the traditional elite in the FRM system. The author described the structure of the FRM system as hourglass

shaped, with the neck of the hourglass situated at county level. Below the county level, two things happened: policy documentation became scarce and the traditional FRM elites occupy role institutions.

At the national level, the ability of policy makers to accumulate data and opinion has led to an expansion of the traditional community boundary that has grown to now include three distinct policy networks and it was difficult for the author to clearly identify any boundary to these networks. It is possible that overlapping boundaries of policy networks have undermined traditional power structures and is driving the shift towards “collective” governance with decision-making pushed down to local level. That possibility is based on a judgement that, with three competing policy networks championing different agendas, it is difficult for national level decision-makers to remain objective and avoid being accused of favouring one network over another. With no higher level to push decision-making onto, the national level has instead chosen to push decision-making downward.

It is possible that the motivation to push decision-making lower in the FRM framework is driven by national level institutions having a “nostalgic” view of local communities, a view leading them to think that traditional systems may still operate at local levels. In Chapter 4, the author revealed that, at the local level, there was indeed a much simpler mindset and a less complex policy structure. However, together with that simpler mindset is a strong attachment to traditional boundaries of responsibility. Interview data suggests that the traditional community elites, perhaps mindful that they have less influence over community members, are resistant to taking on new decision-making responsibility:

*“[The role of the parish council] is to respond to day to days issues on parish affairs – dog poo and dog bins to emergency planning... We are reluctant to take on management responsibility. The parish council is too small. Even taking on public toilets is too big... we have a very restricted remit, unlike Teignmouth Town Council who have more money and a much larger remit.” Parish Councillor (Interview 2)*

Despite local resistance, there is evidence of coercive pressure applied by the national level institutions for local institutions to expand their boundaries and to take on more FRM planning responsibility:

*“The Localism Bill is a worry.... Developing an emergency plan in on our agenda – not yet but in the future... We do not really know who the vulnerable people are and we are not very clear on evacuation plans. We need a “neighbourhood watch” plan, where neighbours look after vulnerable members of the community...” Parish Councillor (Interview 2)*

The implications of local community elites expanding the boundaries of their FRM responsibility is explored next.

#### **5.5.4 Implications for traditional community elites**

The analysis above, when linked to the discussion in previous sections of this chapter, suggests that traditional elites operating at the local level will have to re-manifest themselves as facilitators rather than decision-makers shaping the behaviours, values and beliefs of the community they represent. Here again the Shaldon flood risk example shows how this transition can be made to good effect. Shaldon Parish Council has a system whereby it sets up a working party to liaise with the community on local issues. When applied to local FRM issues, the working party system absolved the parish councillors from having to decide what is best for the community. Instead, the parish council focussed on effectively engaging

“interested/motivated” individuals with national level FRM institutions in actions to address the local flood risk. Shaldon had a history of such engagement, it was easy to form another working party to deal with the Environment Agency when needed:

*“I used to run the sandbag group which liaised with the environment agency to help with flooding and we had 30 volunteers... Sandbagging is more or less over; we have an emergency sandbagging team if the flood gates cannot be closed. We have taken over responsibility for gritting minor roads [part of the snow warden scheme].” Parish Councillor (Interview 2)*

The parish councillor view on community engagement may be contrasted against the town council, community liaison officer view:

*“The problem has been to convince businesses [economic elite] that are being quite successful that they need the town management. There is an “if it ain’t broke don’t fix it” attitude, but they don’t understand that if we didn’t have town management we would go backwards. We are ahead of the game at the moment, if we don’t have one of these we will fall back. It is very difficult to get people to understand that.” Town Community Liaison Officer (Interview 3)*

The distinction between the town and the parish was quite nicely explained by the regional emergency planner:

*“It is easier in the smaller parishes because the parish council can bring everybody together. Whereas in the city where the city council is sitting over everybody but all the wards and councillors are disparate groups and it is hard to bring those areas together. The larger the community gets the less understanding of the risks there is and also because there is always a resource available to deal with incidents there is less understanding of the community resilience side.” Regional Emergency Planner (Interview 5)*

In this instance, it does not seem that the ever extending boundary of virtual communities is the main issue of importance when explaining the diffusion of

traditional power structures. Rather it is the “fragmentation” of the community into competing groups that diffuses the power of the traditional elite. The larger the community, the more fragmented it becomes, and this research would suggest that fragmentation can reach a critical point very low down in the institutional framework. Indeed, in some areas, the base point (if it is larger than a parish) will have no cohesive social edifice at its foundation. The suggestion here is that efforts to extend the boundary of FRM decision-making to the local level may have poor results in anything but the simplest communities. However, the Shaldon approach may be effective in overcoming the effects of a fragmented community and it serves as a valuable lesson for other communities.

#### **5.5.5 Identities of traditional and modern community elites**

When conducting observational studies, it was hard to discern the virtual networks where modern community members construct their identities. What was clearly observable was a legacy of edifices that pointed to the existence of historic institutions, where traditional community elites had created their identity and exercised their power. Those edifices are places where communities would gather and where elites could situate themselves in surroundings that reinforce their identity and justify their power (offices, club houses, churches, schools, etc.). Figure 5.13 shows a collage of such edifices, which include community service institutions, retail and industrial institutions as well as edifices housing community groups.



a.

b.



c.

d.



e.

f.

**Figure 5.13 Edifices to traditional forms of community where elites may reside in the Teignmouth Case study site**

**a & b Community Service edifices: Police Station, Doctors Surgery**

**c & d Industrial and retail edifices**

**e & f Community group edifices: RNLI and British Legion Club**

**(Source: Author)**

Visible edifices make traditional power structures difficult to erase from the “social memory” of the community. It is possible that this memory of old ways of working may be beneficial, as the legacy of physical edifices remind the community of the “old ways” (tried and tested) of getting things done.

It seems also that modern community networks are not building physical edifices, but that is not to say that virtual edifices are any less evident. Online networks did not feature significantly in the case study community (see Table 5.5). On average, questionnaire respondents were members of 4-5 networks and the first five networks accounted for 78% of all responses. Friends and Family were the main networks that nearly all respondents described themselves as belonging to. The next two networks (hobby groups, trade and professional associations) were fragmented into 55 sub-groups (25 hobby groups, 30 trade associations).

**Table 5.5 Networks to which questionnaire respondents were members**

(Source: Author)

Network descriptor	Responses	% of sample (n)
Friend networks	88	97%
Family networks	87	96%
Hobby groups	58	64%
Trade and professional associations	48	53%
Work colleague networks	40	44%
Local Community groups	29	32%
Religious networks	17	19%
Public bodies	15	16%
Non-local charitable groups	12	13%
Age related groups	7	8%
Flood specific network	5	5%
Online network	2	2%
None specified	3	3%
Number of respondents, n		91
Average number of networks per respondent		4.5

What is interesting is that the top five social networks are mainly networks where the focus of engagement is to the “individual” good and not to the “collective” (or community) good.

Three networks that may have the community interests at their heart and be places where the traditional community elite may be positioned (local community groups, religious networks and public bodies) only accounted for 15% of the responses.

Interestingly, this research targeted three communities where 100% of respondents were at risk from flooding, but membership of networks formed specifically to deal with flood risk issues amounted to only 1% of responses.

#### **5.5.6 Lessons learned**

At the start of this section, the author stated that this research would like determine if the changing nature of modern communities may have had some role in diffusing the power of the traditional elites, making them less relevant to external institutions. The suggestion taken from the established literature was that modernity was destroying traditional forms of community and mobility was forcing communities to re-manifest in loose unbounded networks.

The expectation was that community members would be found having multiple identities in multiple networks and, in all of this, the traditional community elite would be disempowered. The evidence analysed supports the notion of a move away from community networks to more individualistic networks and thereby the notion that the power base of the traditional community elite has been eroded. However, community members have not migrated to “temporary” and ephemeral virtual networks, they have positioned themselves in stable (if virtual) networks comprising friends, family and work colleagues.

These social networks are not “symbolic” or imagined communities; they are real and traditional forms. It would appear that the erosion of power held by community elites may be due not to mobility or by a drift into cyber worlds, but by choices made by community members to associate with networks where there is less regulation.

In an era where regulation is being pushed downwards to the local level, it seems that communities are moving themselves away from the institutions that are given the power to regulate the community. That move points to another issue, one that will be explore further in the next section; specifically that membership of the community requires some sacrifice of individual freedom and new demands on communities may be requiring sacrifices that community members do not want to make.

## **5.6 Freedom from sacrifice and the opt in/out culture of modern community membership**

### **5.6.1 Section outline**

As alluded to at the end of the last section, it seems that individuals in the communities investigated as part of this thesis are drifting away from traditional community networks. The traditional community networks are where the beliefs, values and behaviours of community members would have been shaped by, what may be described as “a traditional community elite”. The author suggested that this drift may have something to do with individuals not wanting to sacrifice their freedoms, or that the cost of community membership was a price higher than they are willing to pay.

Etzioni (1995) explored the nature of the sacrifices given up by individuals as a cost of entry to a community. Etzioni judged that it is important the individual should not be consumed by the community and there needs to be a balance between the level of freedoms retained by the individual and those sacrificed to the community. To Bauman (2001), such a balancing act represents a paradox defined by the individual’s desire for security versus their desire for freedom. Bauman also suggested that when communities are exposed to a crisis elites can easily opt out, leaving the poor and weak to suffer the effects of the crisis. He predicted that this action would result in a trend towards the promotion of communalism, but that this promotion would be seen as a philosophy espoused by the weak, or by those with something to gain from the creation of a “stronger community”.

The idea of individuals, or entire elites, opting out of the community is interesting and may offer an alternative explanation for the lack of a visible role by the community elite in the resolution of local flood risk management issues. So, and by way of linking the ideas expressed above to this thesis, this section will explore the phenomenon of communities of/in crisis to assess any evidence suggesting that “community resilience” is a philosophy espoused by a collective of weak individuals, largely abandoned by the more affluent and powerful elite.

### **5.6.2 Evidence of a community of crisis enhancing FRM resilience**

Booth-Fowler (1995) studied communities that arise out of crisis situations, which he described as; thin, tyrannical and less open. According to Booth Fowler, in crisis communities dissent is often quashed, suggesting a powerful hierarchy and a high level of coercion. Crisis communities are also temporary, fading as the threat of crisis diminishes and individuals can then easily opt out.

The review of flood risk policy documents provided some evidence of communities created out of crisis. Specifically, the author noted spikes in the growth in policy/legislative documentation following flood events in the 1940s, 1990s and in 2000s (Figure 5.14). Spikes in policy document production show similarities to spikes in the reporting of flood incidents in the UK press (Escobar and Demeritt 2012). Although institutional engagement in the flood risk management framework was enhanced after a crisis, there was less evidence of the community fading as the crisis faded. To some extent, this may be explained by the focus the policy community had, which was not just in responding to the current crisis but also to mitigate the effects of future crises.

What Figure 5.14 highlights is that established communities, like the FRM framework community, may be enhanced at times of crisis. However, this may have the effect of adding to system complexity. As the system for flood risk management got more complex between 1990 and 2012, it is not clear that crisis events were reduced, but coordination of community response was improved.

Broadly speaking, the period of policy development in the 1990s marked the point when the three policy networks were all brought collectively into the FRM framework. The three policy networks did not sit easily with each other, as both urban and environmental planning networks have long-term forward looking policies, but the contingency planning network has historically focussed mainly on immediate response after a crisis incident. Hence, the subsequent period of development, following flood crises of 2000-04, focussed on making the interdisciplinary framework operate more effectively. It is possible that this broadening of the flood risk community after each crisis explains how the three policy networks have become so intertwined.

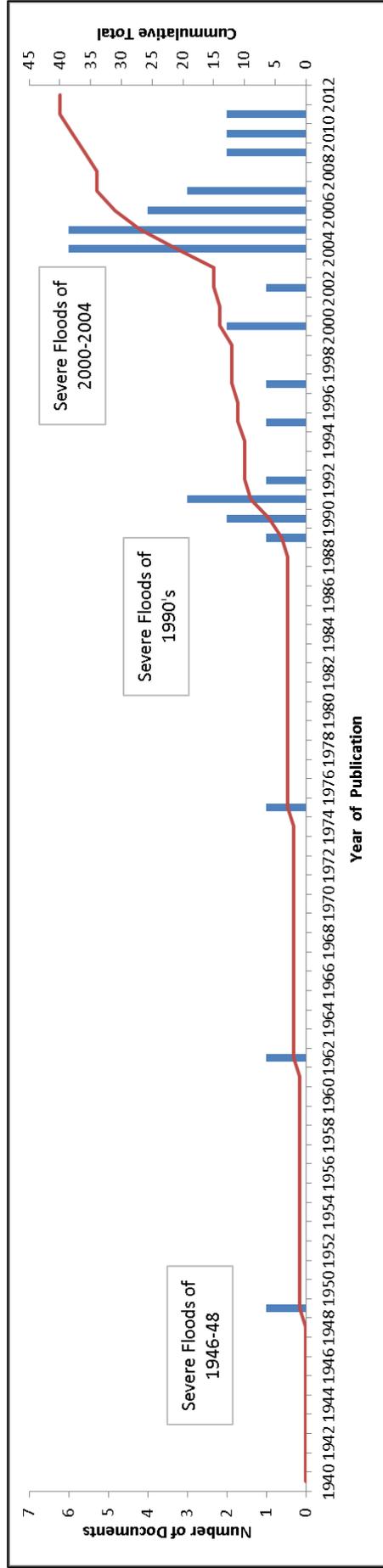


Figure 5.14 Dates of Publication and Numbers of Flood Risk Management Policy Documents

(Source: Author)

Between them, the policy networks fit well with the definition of community resilience. That definition points to a need to providing a broad based perspective of the flood hazard, spanning: economic, social and environmental concerns. In addition, resilience based FRM policy needs to have a perspective that incorporates the history of previous events, a capacity for immediate action in response to a current event and forward planning to mitigate the effects of future events. In this way, the FRM framework community, when viewed as one emerging from a series of crisis events, is seen to have a lasting and beneficial impact on community resilience.

### 5.6.3 Examples of communities of and in crisis

Within the case study areas, the questionnaire survey revealed little evidence of communities in crisis. That was partly due to the fact that none of the communities had suffered a severe flood in recent years (see Table 5.6).

**Table 5.6 Summary of answers to question about historic flood events in the case study communities**

(Source: Author)

Q8. Do you know when the local community last experienced a flood?
<b>Newton Abbot</b> 36 affirmative responses - main memory is of one major event in 1979, but little evidence of anything more recent.
<b>Teignmouth</b> 31 affirmative responses - 1930-2009 approximately once per decade but four times since 2000. Recent floods tend to be localised after work in 1990s to improve drainage in areas of historic flooding.
<b>Shaldon</b> 17 affirmative responses - possibly 2002-2009, 3 occasions of partial flooding due to tidal locking, once in 1990 but recollections were not very strong.

To some extent, the Shaldon Parish Council working party system is an example of a system that deliberately exploits the idea of crisis communities. The working party system sets up temporary communities to deal with a local issue. Rules are quite strict and the community is controlled by the parish council, but members of the community can opt in or out of the working parties as the motivation moves them.

*“We have an annual parish council meeting where members of the public are invited. Public can also attend our monthly meetings.... We can set up a working party if necessary to deal with extra issues.... By and large it is easier to work with organisations, but occasionally we have to work with individuals, say by public meetings. There may be activists within a community who wish to engage public support and we can help by organising a public meeting” Parish Councillor (Interview 2)*

The feedback from the institutional interviews revealed very little use of the term “crisis community”, but there was evidence that crisis events were a driver for changes in policy direction. Changes in policy direction were changing the distribution of power within the FRM framework:

*“There is an intention to divest responsibility down to parish level. We are concerned that the district is trying to get rid of its assets and pass them down to the parish level, but we have no money or people to handle new responsibility.” Parish View (Interview 2)*

*“Following the Pitt report FRM responsibility was transferred to top tier county authorities. District had been doing it for years and now county has to re-invent it. The regional level of emergency planning was recently been abolished. LRF are formed around the 40 National police authorities and the regional gov. for the SW had a regional resilience forum which included 4 or 5 LRFs. Now there is the Resilience and Emergency Division (RED) – there are 3 and one for the whole of the south and west, based in Bristol.” District View (Interview 1)*

*“We are about to take on new duties - the EA is handing over responsibility for consents related to developments affecting “ordinary” water courses – it comes into effect in April 2012... We need to make others more aware of our role. Lots of people misunderstand what we do. We are gradually reaching out to people, but we still get queries directed to us that should not be. We are supposed to maintain a strategic view and focus on partnership development - not be involved in individual planning applications, which should stay at the district*

*level. I cannot see things changing, but several parts of the Act are still unclear – for example the enactment of the SUDS part keeps getting put back. Everything may change.” County View (Interview 4)*

*“The regional forum is still working slightly, as the regional government was abolished, we now have REDS and we are getting good service from them. The RCCC never really worked anyway. We do not have many regional level issues, but the new system will be tested when we do have an incident - when one area needs help from another in the region. We are rebuilding the regional system in a different way. Planning for the Olympics is a good example of the new system. Historically we have some strong regional working systems because of our geographic location in the South West.” Regional View (Interview 5)*

#### **5.6.4 Lessons learned**

It could be said that the more powerful (national level) institutions are opting out of the decision-making process, leaving the weaker (local level) institutions to take the important decisions. Criticism by weaker institutions of the opt-out by higher level institutions is mixed and could be described as slightly pessimistic below county, ambivalent at county and slightly optimistic above county level.

The critical criteria linking opinions seems to be the burden of decision-making responsibility coupled with the resources to shoulder the burden. Regions are well resourced and have a lower burden of responsibility in the new FRM framework county is getting more resources and more responsibility, district is losing resources and responsibility and town/parish levels are taking on responsibility with no added resource. In this case the “weak” institutions do not appear to be advocating communalism; rather the “stronger” institutions are the espousers of the philosophy.

In this instance also, the powerful and affluent elite are seen to be stepping back from the community, but they are not relinquishing control. As the national elite step back from the flood risk management community, they have divested much of their

power, responsibility and resources to the EA. So, the EA has become a proxy “enforcer/regulator” in the absence of the national level government elite. The national level government elite are also a strong voice promoting the idea of community resilience and there is a possibility that this philosophy has a similar rationale to that related to the management of flood risk. That would suggest there will be more enthusiasm for efforts to promote community resilience at higher policy levels, but less enthusiasm within the communities themselves (to be discussed further in Chapter 7).

## **5.7 Conclusion**

This chapter set out to explore the community concept in a way that would help to enhance an understanding of community resilience. It started by examining the usefulness of the traditional community concept and evidence that communities were being coerced by the state to take on more responsibility for FRM decisions. It then looked at the influence of powerful elites within community networks in an attempt to reveal the effects of modern patterns of behaviour on the workings of the traditional community elites; thereby, on community resilience.

When looking at the traditional concept of community, this thesis has found evidence to support previous research findings that institutions do indeed tend to prefer older and simpler definitions of community. Institutions have developed a range of tools based on this simplified understanding to help them identify and define communities. The author used two such tools (namely flood risk maps and the land use classifications system) to commence this research. The tools proved helpful to the research, where observation and questioning were less effective. Using the tools, it was easy to identify the flood risk communities and sub-divide them into distinct sub-

parts. From this platform, the research was then able to apply more subtle academic techniques to develop a deeper understanding of the case study communities. When questioning community residents the author found significant evidence of sections of the community that were either unknowledgeable about the flood risk or were in denial of the threat posed to them individually. The traditional community concept used by institutions was not very effective in dealing with those elements of the community and the concept needed to be enhanced with a more subtle academic understanding.

From within the academic literature, the author focussed on the suggestion that communalism would be a philosophy espoused by the weak, but in this research found that communalism (and potentially community resilience) is a philosophy espoused by a national and policy elite. The weaker elements in the flood risk management framework were somewhat resistant to the new philosophy. The issue for local communities centres on an increase in responsibility with no comparable increase in resources to enact responsibilities. It is possible that national elites are not fully aware of this resistance or the reasons for the resistance. There is also little evidence to suggest that national and policy elites are willing to release control over resources that local communities are requesting. The reason for national level entities retaining control over resources seems to stem from a fear that the communities may become “over resilient”. That being said, the drive to promote community level engagement in flood risk management decision-making may at first have been appealing to a community elite. These elites would have benefitted from the additional power it would have given them. However, the traditional elites have seen their power eroded as community members have drifted away from membership of groups where the community elite have traditionally held sway. The

drift away from these institutions may have been due to higher than acceptable sacrifices required by individuals or overregulation by community elites.

The diffusion of power by local elites presents a problem for state institutions seeking to engage with the community. It is difficult to know which community institutions to trust and which community elites represent the community most effectively. As the communities get larger, this problem becomes more acute and the evidence from this research is that only the smallest parishes and rural communities possess structures that enable easy interaction with external institutions. In order to create an effective structure for community-institution interaction, the concept of communities and institutions “congealing” proved to be useful. The author found that effective community-institution interaction was achieved when the institution congealed with the community and the community congealed around a local institution. Congealing was done with the aim of facilitating engagement and not necessarily to coerce or negotiate. Interestingly, the flood risk management example illustrated by this research revealed that the congealed community-institution engagement seem to be aimed at minimise resistance to institutional actions and providing a focus for the community to express its concerns. Beyond that, the traditional planning system was still the main area where decisions to approve flood mitigation actions were taken.

The congealing process seems to require the creation of a new and temporary role; that of community liaison officer. It seems important that the role is independent of both parties and its function is to translate complex technical material to community members and to ensure community concerns were effectively conveyed to the institution. A community liaison role is not always effective and the evidence here is that parties involved in the process need to see some potential benefit before they

will engage with the liaison officer. The idea of communities of crisis helped to shed light on how this may work.

Communities of crisis were described as temporary communities, quickly created and quickly fading. In the Shaldon example, a community of crisis was quickly established, congealing around the parish council. The threat to the community was made clear by the Environment Agency, who proposed a new flood defence scheme. Here, the parish council's use of working parties facilitated the formation of a temporary flood risk community. Community residents could opt-in or out, but the process was controlled by the parish council. The system retained some legitimacy because the parish council had a remit to represent the entire community and was able to ensure that no single minority dominated interactions with the Environment Agency. Having established the two main points of contact (one in the state institution and one in the community), the community liaison role was effectively enacted.

The author also applied the community of crisis concept to the flood risk management framework and found evidence of this social form, but it was manifested differently. In the framework, there was evidence of crisis events enhancing the flood risk management community, but the effect was to increase policy complexity. Unlike the community based crisis community, the policy based crisis community did not fade with time. In the policy framework, crisis events triggered spikes in policy development, shifts in emphasis and changes to the distribution of power. Those changes may explain how it came about that the national level elite decided to push decision-making to lower levels in the framework.

The permanence of the community of crisis in the flood risk management framework resulted from the permanence of the policy edifice created in the wake of the crises. Long-lasting edifices created by communities could also be seen in the case study areas. The community edifices were physical, real world constructs, dedicated to traditional community based institutions where elites had historically held sway. Those edifices help to preserve a memory of old ways of doing things (tried and tested ways). In times of crisis, they provide a focal point around which the community can congeal. These traditional (but now less used institutions) provide the hierarchies needed in times of crisis to create the thin, tyrannical structures that can coerce the community to overcome challenges and survive crises. After the crisis, individuals are free opt-out if they wish and return to their less-regulated social networks. In the next chapter, the author will explore how those social networks may be utilised to create capital resources and mobilise them effectively in times of crisis; thus building community resilience.

## **Chapter 6. Community-Institution Social Capital (CISC)**

## 6.1 Introduction

For the investigation of social capital, this thesis will be narrowing its field of enquiry and the subsequent discussion considerably. In Chapter 2 the author presented a broad overview of literature on the subject of social capital, but for this study the research interest is limited to a particular type of social capital, namely that derived from community–institution links. Within the literature reviewed for this thesis there was very little evidence of previous research that focussed specifically on Community-Institution Social Capital (CISC). As such, this chapter will provide a much needed and deeper elaboration of the nature and significance of this specific form of social capital. The analysis of CISC presented in this chapter is divided into three parts.

In the first part (Section 6.2), lessons about social capital derived from the established literature are explored to reveal how CISC is manifested at both the individual and collective levels (Catts 2007, Haerper *et al.* 2005, Mohan and Mohan 2002, Putnam 1993). The second part (Section 6.3), explores the issue of how both social capital and CISC are viewed in relation to other forms of capital and contrast findings made against that of previous research on this topic (Dixon 2005, Grew 2001, Kovalainen 2005, Rosenband 2001, Rotberg 2001). In the final part (Section 6.4), findings by Adger (2000) and Radcliffe (2004) relating to the uses and effects of mobilising social capital to address community resilience issues are explored.

When undertaking the detailed review of the topics outlined above, this chapter in particular, draws heavily on the use of social network analysis. Data collected from both the documentary analysis of the FRM institutional community and the community surveys were used to create social network diagrams to represent CISC

in all four communities studied as part of this thesis. Those social network diagrams (sociograms) were used as a foundation upon which to draw conclusions about ways in which CISC could be used to enhance community resilience.

## **6.2 Manifestations of CISC at individual and collective levels**

### **6.2.1 Section outline**

When analysing CISC in the study communities, a number of issues need to be explored. One such issue relates to the discovery by earlier research that the manifestation of social capital at individual and collective levels can be markedly different and that strong social capital at one level is no indicator of strong social capital at the other level (Putnam 1993, Haerpfer *et al.* 2005, Catts 2007, Mohan and Mohan 2002). This section will explain how that distinction is manifested in CISC.

As a starting point, Putnam (1993) described social capital as a by-product of social activity and the author utilised this idea to determine the level of CISC held by institutions and communities that are the focus of this study. Measures of CISC will be based on the number of links discovered between an entity in the community and an institution, group or network. CISC is indicated in figures by the size of disc representing each entity (see Figures 6.1-6.4 below).

The analysis is mindful of the findings by Kovalainen (2005), namely that social capital is a useful tool to help describe and explain social actions, but it is not without its problems. Koniordos (2005) hinted at the problems inherent in using social capital to explain social actions. To Koniordos, the social capital concept has expanded significantly, acquiring an overlapping theoretical matrix that has blurred its definition and led to a split in its theoretical foundation. Haerpfer *et al.* (2005) described the

split in the conceptual understanding of social capital, which to them has led to two sub-forms of social capital: formal social capital (accessible to all) and personal social capital (unique to a particular individual). The split described by Haerpfer *et al.* (2005) is of great interest to this thesis and analysis in this section will use the ideas of formal and personal social capital to sharpen the conceptual understanding of CISC.

For Catts (2007), social capital at the individual, community and national levels all involves different constructs and may be manifest in different ways. Added to that, Mohan and Mohan (2002) argued that social capital can be high within communities (individual level), but low between communities (collective level). This research will analyse the influence individual social capital has over CISC at the collective level. In relation to that assessment, Lin (2001) identified four reasons why individual agents invest in social capital: to facilitate the flow of information, to exert influence, to certify the credentials of the agent and to reinforce the reputation of the agent. It is possible that these factors may be at play in both the flood risk management framework and within the communities themselves. This section will evaluate if Lin's factors also impact on the development of CISC.

For the analysis, the author has split data into four parts. Data from the flood risk management framework community is presented first and is followed by data from the three case study flood risk communities in Newton Abbot, Teignmouth and Shaldon.

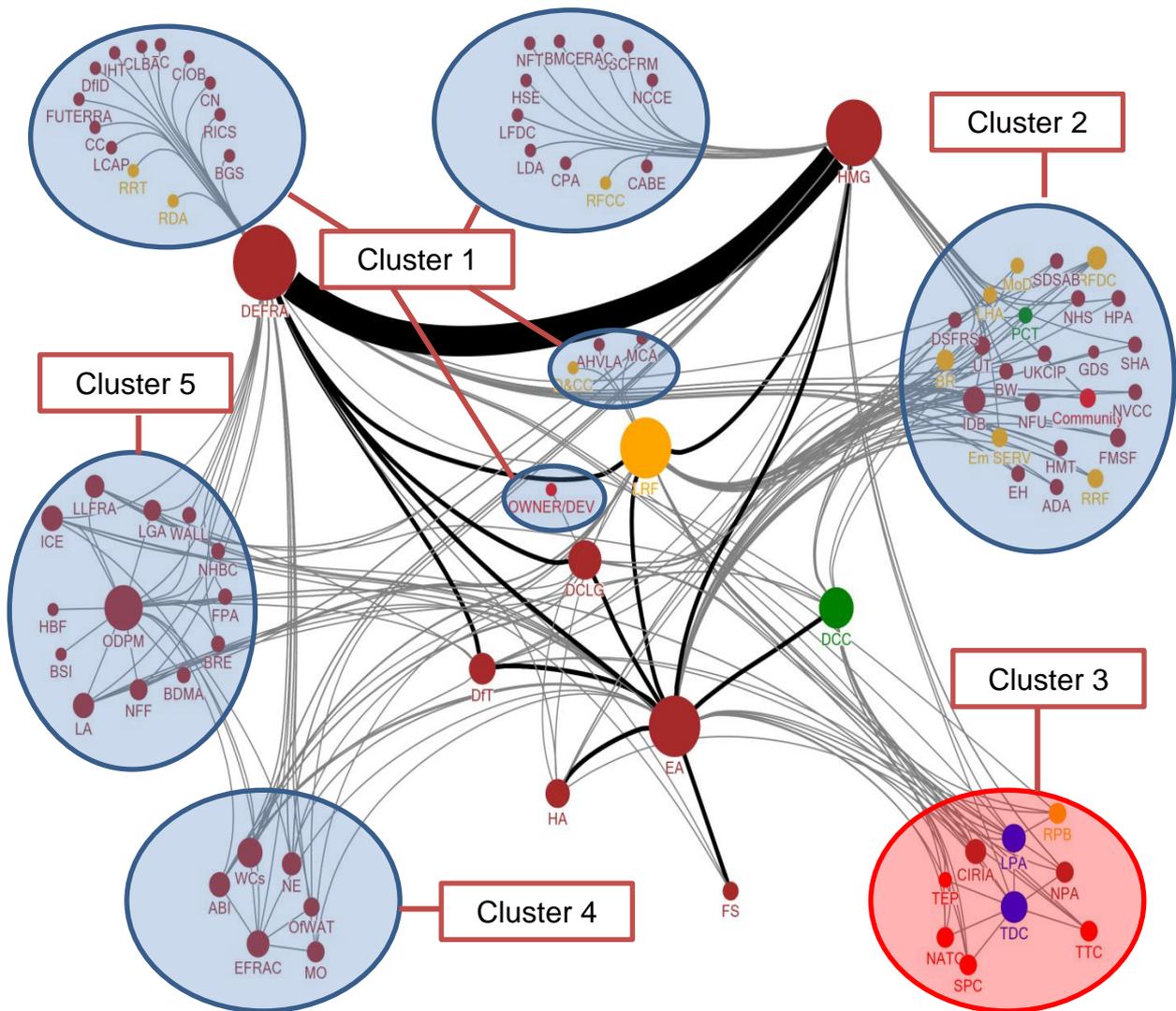
### **6.2.2 CISC in the Flood Risk Management Framework**

Examining the flood risk management community, it is possible to distinguish patterns of behaviour where social capital can be assessed using Putnam's

simplified approach (Putnam 1993). This thesis has already explored links between institutions that make up the FRM framework (see institutional openness figures in Chapter 4). The previous discussion used links between institutions as an indicator of the openness of institutions. For the analysis in this section, links will be analysed in more detail to gain some measure of CISC. When trying to discern the type of social capital that may fit the definition of CISC within the FRM framework, there are two ways to approach the analysis. One is by looking at institutions that lie at the heart of the framework, where to some extent the FRM community is seen to connect to the institution (may be denoted as  $C > ISC$ ). The other is to look at institutions on the edge of the FRM community that seek to connect to the community (may be denoted as  $C < ISC$ ).

When looking at the institutions in the FRM framework, links between DEFRA and HMG were found to be both frequent and reciprocated multiple times (Figure 6.1). In this way, both institutions are judged to have high CISC (indicated by thick black line). Seven other institutions (EA, LRF, DCLG, DCC, DfT, HA and FS) all possessed similar levels of CISC by virtue of having reciprocated links with each other, but the frequency of reciprocation was less than between DEFRA and HMG (signified by thinner black lines). Collectively these nine institutions form the core of the FRM framework. Put another way, the nine institutions represent the core community where the rest of the flood risk management community is seen to connect to them (i.e. they possess both  $C > ISC$  and  $C < ISC$ ). It is interesting to note that only one institution in the core group (the EA) has reciprocal links with all other institutions in this core group (a complete set of  $C > ISC$  and  $C < ISC$ ). The EA links would suggest that it should have the highest level of social capital. However, the strong links

between DEFRA and HMG elevates their CISC (using Putnam's 1993 measure) above that of the EA.



Institution colour code	Cluster Legend
Local <span style="color: red;">●</span>	<b>Cluster 1</b> - institutions with only a single link to one of the institutions in the core group
District <span style="color: blue;">●</span>	<b>Cluster 2</b> - institutions with multiple links to institutions in the core group
County <span style="color: green;">●</span>	<b>Cluster 3</b> – institutions with links to the case study communities
Region <span style="color: yellow;">●</span>	<b>Cluster 4</b> – institutions with a common link to an institution outside the core group (EFRAC)
National <span style="color: darkred;">●</span>	<b>Cluster 5</b> – an obsolete group, clustered around the ODPM institution, now replaced by DCLG

Figure 6.1 NodeXL sociogram of the FRM framework showing sub-clusters

(Source: Author)

The apparent discrepancy in the measure of social capital between DEFRA, HMG and the EA highlights problems with Putnam's early approach (alluded to by Kovalainen 2005). It is possible to understand the limits of Putnam's 1993 approach to the measure of social capital by looking more closely at the other (non-core) institutions in the framework. Non-core institutions are defined as having unreciprocated links to the core institutions (indicated by grey lines) and have been grouped into five clusters for the purpose of this analysis.

**Cluster 1** – within this cluster are four distinct sub-parts of the FRM framework. All of the institutions in cluster 1 have only a single link to one of the institutions in the core group. The link is unidirectional (emanating from the core group institution to the cluster institution and not reciprocated, C>ISC). With just a single unreciprocated link to the FRM framework, Cluster 1 institutions can be judged to possess the lowest CISC within the framework and seem to play a minor or passive role in the development of flood risk management policy. By this, it could be envisaged that C>ISC identifies institutions that are reactive passive/participants, only undertaking an action, providing data or providing resources as requested by the community.

**Cluster 2** – within this cluster are institutions with multiple links to institutions in the core flood risk management group. With the increased links, these institutions are judged to have more CISC than institutions in cluster 1. Some institutions in cluster 2 have many links, while others have just a few links. The institutions are clustered together because all the links are unidirectional and of the C>ISC type (as with cluster 1). Due to the higher number of links to other institutions in the framework, Cluster 2 institutions have a higher level of CISC than Cluster 1 institutions. However, because the links are of C>ISC type, cluster 2 institutions share the cluster 1 trait of

being passive/reactive agents. The passive nature of these institutions diminishes the value of their CISC. Looked at another way, as long as the links remain unreciprocated, the CISC may be judged to be immobilised (or stored).

**Cluster 3** – this cluster is important (noted by red colour) as it is the cluster where links to the case study communities are found. Links in this cluster are similar to those in Cluster 2, but they also share a link to a common institution (TDC – a district level institution). This cluster may be viewed as a sub-community (or clique according to Knoke 1990, Scott 2000), having its own internal CISC with TDC at the centre of the sub-community. TDC plays an active role in this cluster with links directed outwards to the other cluster institutions giving it the potential to be a powerful voice within the overall framework (high individual level CISC within the FRM framework). However, this research found no evidence of reciprocated links to TDC from other Cluster 3 institutions. As such, the influence of TDC in the FRM framework is undermined and the strength of the sub-community is also depleted (the collective CISC is low). TDC may still act as a voice to represent the views of Cluster 3 institutions to the core group of institutions in the FRM framework. In the core group and from a geographical perspective, DCC (the county level institution) would be the logical institution to represent the views of TDC. Such a representative role for DCC would elevate the power of DCC over Cluster 3. However, the power of DCC has been undermined by other institutions in the core group, who have created their own direct links to institutions in Cluster 3 (namely EA and LRF). TDC still plays a key role in facilitating CISC with the case study communities, but just as the power of DCC is diminished by links that bypass it, core group institutions can bypass TDC to engage directly with the sub-community members. This analysis of Cluster 3 reveals how CISC can be high within communities (individual level), but low between

communities (collective level), as described by Mohan and Mohan (2002). Also (and in contrast to the analysis of Cluster 2), the findings from the analysis of cluster 3 institutions does support Lin's "four reasons why institutions may invest in social capital" (Lin 2001). Specifically, there is good evidence to explain why an institution may invest in the creation of CISC to facilitate the flow of information, to exert influence, to certify its credentials or to reinforce its reputation.

**Cluster 4** – this cluster is similar to Clusters 3 and 2. Like Cluster 3, there is an institution at the centre of this cluster (EFRAC). EFRAC is linked to other institutions in the cluster. However, EFRAC's influence over the cluster is weak, as it has few links outside the cluster (high internal C<ISC but low external C>ISC). In particular, WCs are more strongly connected to the rest of the FRM framework than EFRAC and these links give WCs more external C>ISC than EFRAC. What is unclear is whether WCs' additional external C>ISC is sufficient to undermine the influence of EFRAC's internal C<ISC. If WCs external C>ISC remains immobilised then its potency is diminished. However, knowledge of the potential capital possessed by WCs may make EFRAC wary, or at least careful, when attempting to exert influence over the cluster institutions. This case reveals how the idea of CISC may be split between internal and external variants and it also reveals how CISC analysis can become blurred in the same way as studies into mainstream social capital (described by Haerpfer *et al.* 2005, Mohan and Mohan 2002, Catts 2007).

**Cluster 5** – this cluster is similar to Clusters 2, 3 and 4, but the institution at the heart of this cluster (ODPM) is distinctly interesting. The ODPM is a defunct organisation (replaced by DCLG in 2001), but it had a high rank in the overall FRM framework due to the number of connections to other institutions in the framework (high

individual C<ISC and C>ISC within the FRM framework). The rank of the ODPM was higher than the institution that has replaced it (DCLG), but the DCLG is in the core group. This defunct cluster seems to have successfully transferred some capital (cultural, human, physical and economic capitals – discussed in more detail below) to the new institution, but not the C<ISC it possessed. It does appear that C>ISC within the core group has been transferred from the OPDM to the DCLG. More precisely, the DCLG does not appear to have refreshed its links to the institutions in this cluster, whereas many other institutions in the core group do seem to be retaining their links to Cluster 5 (DCLG has not invested in C<ISC). The failure of DCLG to refresh connections to Cluster 5 may diminish its general social capital in the future, especially if others in the core group continue to retain their links with Cluster 5. This example brings the analysis back to Putnam's claim that social capital is a by-product of social activity (Putnam 1993) and is helpful in illustrating how a failure to engage in social activity can lead to an erosion of social capital. It is also possible that the inherited capital from ODPM has dis-incentivised DCLG from investing in C<ISC (counter to Lin 2001). Specifically, DCLG has inherited influence, credentials and reputation, so sees no need to facilitate the flow of information by investing in CISC.

This analysis of the FRM framework has revealed a number of facets of CISC. By applying the community concept to the FRM framework, it has been possible to distinguish CISC. The fact that members of the FRM framework community are mostly institutionalised entities has greatly assisted in the assessment of CISC. Institutionalised entities have created policy documents outlining rules, roles and procedures to regulate the actions of the entities in the framework. With such a body of evidence, it was possible to distinguish between core and non-core entities and

reciprocated and un-reciprocated links. That distinction was not possible in the case study communities where entities were largely un-institutionalised.

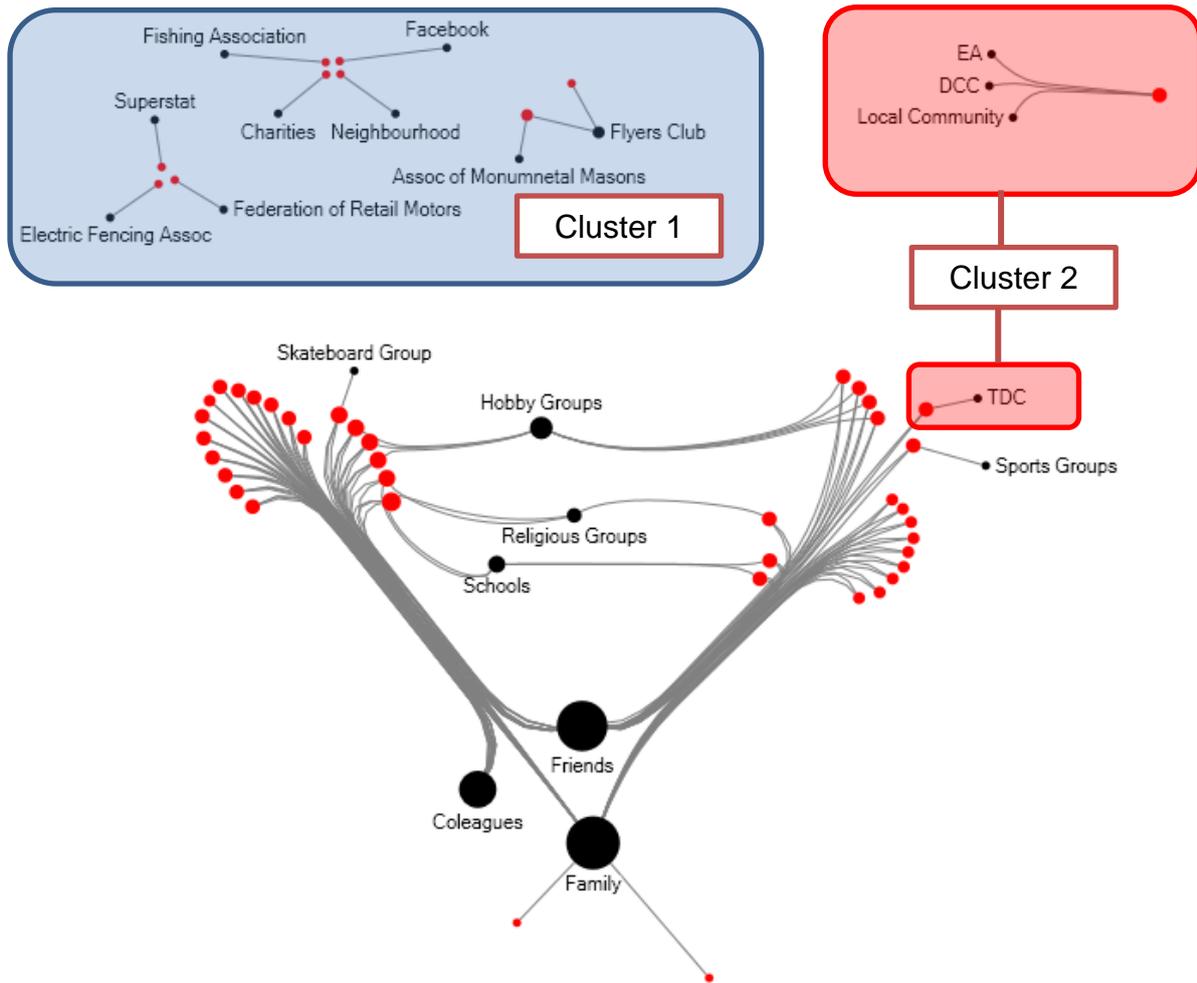
### **6.2.3 CISC in the Newton Abbot Case Study Community**

In the case study communities, there was no clear published documentation setting out the pattern of linkages between individuals and groups/institutions in the community. As such, data was gathered using a questionnaire survey (see Chapter 3). Questionnaire respondents were asked to volunteer information about the networks and groups with which they were associated. The resulting links are unidirectional, emanating from the individual to the collective network/group (all C<ISC) and the sociogram looks very different to the FRM framework. The Newton Abbot sociogram includes points that represent individuals (**red dots**) and points that indicate the institutions, networks and groups associated with each individual (black dots). The strength of CISC possessed by institutions and individuals is denoted by the size of its respective disc (based on number of links).

The measure of CISC of the flood risk community must be treated with more caution than used when analysing the FRM framework. In the FRM framework, published documentation was available to quantify links, but in the case study community links were identified by questionnaire respondents (see Chapter 4). When volunteering information about personal links to community networks and institutions, it is possible that questionnaire respondents were less precise than the documentation outlining links in the FRM framework. In both case, the networks can only ever be a partial picture of the complete “real world” set of connections within the communities. However, what this research can usefully demonstrate is how the three different case study communities are broadly structured and this has implications not just for

the improved understanding of CISC, but to better understand how community resilience may be manifest in communities (discussed further in Chapter 7).

Looking specifically at the Newton Abbot case study community, 39 individuals identified 20 different networks and groups with which they were associated (see Figure 6.2). In Newton Abbot, the first point to note is that the network is fragmented. Fragmentation will have a detrimental impact on the social capital in the community as a whole, as breakages in the links between individuals will create isolated clusters of individuals unable to share in the social capital inherent in the rest of the community (Knoke 1990, Scott 2000). Two such clusters are revealed in Newton Abbot.



Vertex colour code	Cluster Legend
Individual ●	<b>Cluster 1</b> - individuals with links to institutions not connected with the main community
Institution ●	<b>Cluster 2</b> – individuals with links to FRM institutions
<b>Note:</b> Size of vertex increases in proportion to the number of its links to other vertices	

Figure 6.2 NodeXL sociogram of Newton Abbot case study community with sub-clusters

(Source: Newton Abbot questionnaire survey)

**Cluster 1** – In the first cluster, nine individuals are revealed with links to networks and groups (CISC), but they have no connection to the main community. These individuals may derive significant personal CISC from their ties to their networks, but this CISC is not accessible to the rest of the community and is largely invisible to this analysis. Using Putnam’s 1993 approach, the institutions and individuals in this cluster may be judged to possess low CISC within the overall community (much like Cluster 1 in the flood risk management framework).

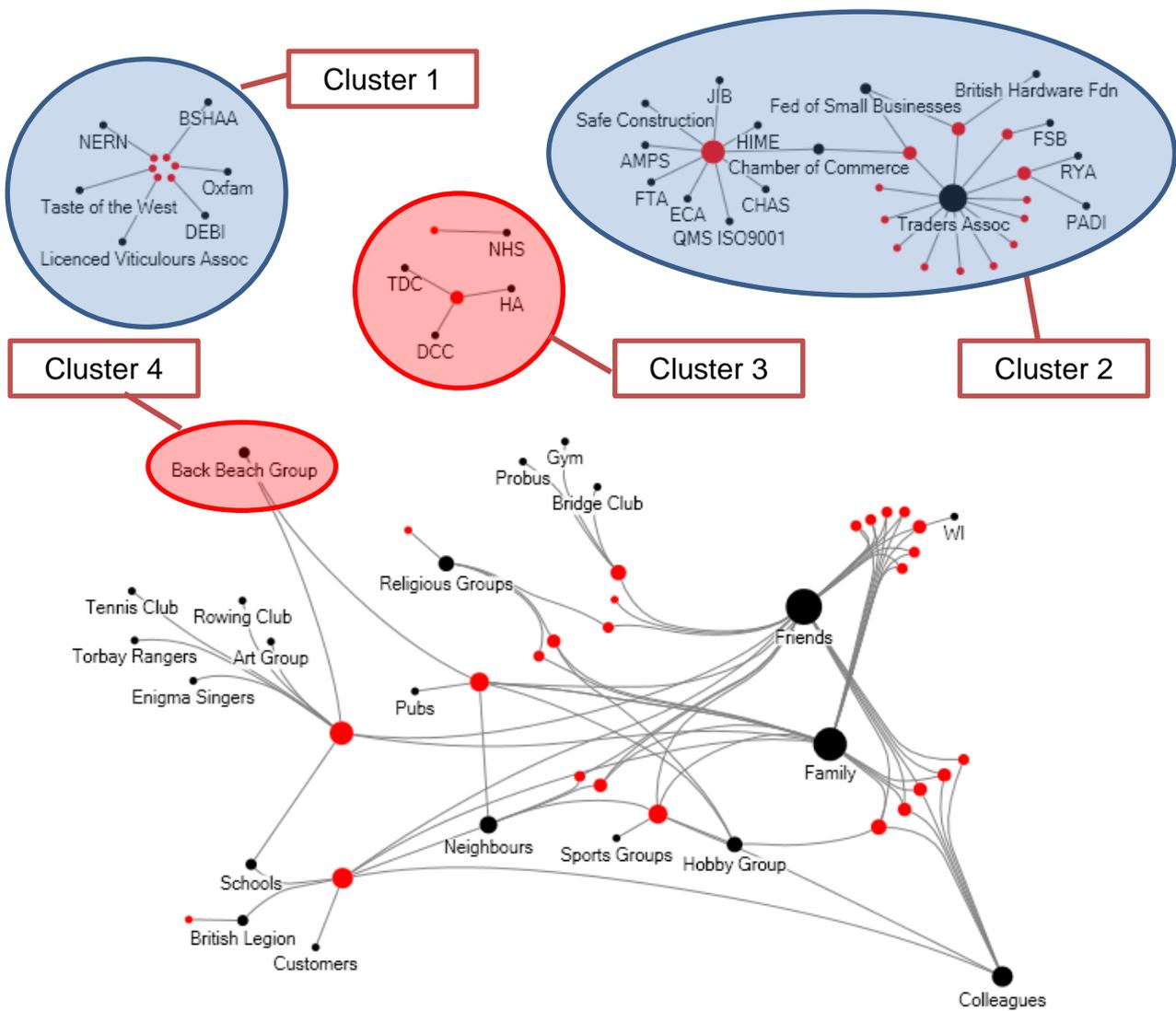
**Cluster 2** – this cluster is important for flood risk management as it includes links to institutions in the FRM framework (thus evidence of CISC directly linked to the FRM framework). Three institutions are identified (TDC, DCC and EA), two of which are institutions at the core of the FRM framework. Unfortunately, other than identifying a broad association with the “local community”, the individual with links to the core institutions did not reveal links to the rest of the community. The main community network in Newton Abbot is linked to the FRM framework by one individual who identified a link to TDC. This has important implications for understanding CISC and supports findings by Mohan and Mohan (2002) that CISC may be judged to be strong between the communities, but low within the community. One consequence may be that FRM framework institutions engaged with these individuals may gain a false sense of connectedness to the local community, as the individuals are not well connected to the whole community.

Within the Newton Abbot community, the majority of respondents identified links to three core networks; friends, family and colleagues. That finding is interesting because those groups may be classed as ones centred on the individual and not the community (an issue for resilience discussed further in Chapter 7). Only three

networks with some community level engagement were identified (hobby groups, religious groups, schools), but links to these were only made by 10-20% of the respondents. In Newton Abbot, it is difficult to see evidence to support or reject Lin's "four reasons why agents invest in SC" (Lin 2001). However, this analysis does help to illustrate how CISC is manifested within the local community and between Newton Abbot and the FRM framework. Overall, CISC may be judged to be low and it has limited potential to grow unless further investment is made to create links within and between the communities.

#### **6.2.4 CISC in the Teignmouth Case Study Community**

Turning to the Teignmouth case study community, 47 individuals identified links to 44 separate networks/groups/institutions (Figure 6.3). As with Newton Abbot, the Teignmouth community is fragmented, but the fragmentation is clearly divided between resident and organisational responses to the survey questionnaire. Four clusters were identified for examination.



Vertex colour code	Cluster Legend
Individual <span style="color: red;">●</span>	<b>Cluster 1</b> - individuals with links to institutions not connected with the main community
Institution <span style="color: black;">●</span>	<b>Cluster 2</b> – individuals with links to institutions not connected with the main community, but forming a strong clique
<b>Note:</b> Size of vertex increases in proportion to the number of its links to other vertices	<b>Cluster 3</b> – individuals with links to FRM institutions
	<b>Cluster 4</b> – A community based FRM institution

Figure 6.3 NodeXL sociogram of Teignmouth case study community showing sub-clusters

(Source: Teignmouth questionnaire survey)

**Cluster 1** – As with Cluster 1 in Newton Abbot, this cluster includes individuals linked to networks/groups with no connection to the main community. The respondents in this cluster are mainly organisational respondents with links to professional networks. At this level, there is little difference between residents in the Newton Abbot Cluster 1, the FRM framework Cluster 1 institutions and the Teignmouth Cluster 1 entities. They are all judged to have low CISC (for reasons previously described).

**Cluster 2** – this cluster is another professional/business network (organisational respondents), but unlike Cluster 1, entities in this cluster are strongly inter-connected. The strong internal links in Cluster 2 enable it to be described as a “clique” within the Teignmouth community (Knoke 1990, Scott 2000). There are two distinct features of Cluster 2. First is an individual with numerous connections to a wide array of professional groups (individual with strong CISC). Second is the Teignmouth Traders Association that has numerous connections to individuals in the community (institution with strong CISC). The strongly connected individual is connected to the Traders Association network via the Chamber of Commerce and this makes the group as a whole potentially powerful. This cluster could potentially exert significant influence over the rest of the community and, if their support was not harnessed, could impact on effort to build community resilience (see Chapter 7 for further discussion on this topic).

**Cluster 3** – As with Cluster 2 in Newton Abbot, this cluster is significant because it possesses links to the FRM framework. In addition and as in Newton Abbot, the CISC cluster in Teignmouth is disconnected from the rest of the community. The disconnect between Cluster 3 and the rest of the community makes further use of

CISC to improve resilience of limited effectiveness unless more links to the community are created (as described previously).

**Cluster 4** – Cluster 4 is important for this research as it contains a group in the Teignmouth community with a direct interest in flood risk management (no such group was apparent in Newton Abbot). What Figure 6.3 reveals is that the “Back Beach Group” has few links (low individual CISC based on Putnam 1993), but it is connected to two individuals with strong connections to the Teignmouth community (high individual CISC). Unfortunately, for the Back Beach Group, the individuals to which it is connected are not connected to Cluster 3 and so it is not connected to the FRM framework. This cluster is ripe for CISC development (see further discussion below and Figure 6.6 for details).

Within the main community network of Teignmouth, friends, family and colleagues feature most strongly, as in Newton Abbot. However, in Teignmouth there is a greater spread of links to institutions. Like Newton Abbot links to hobby groups, religious groups and schools feature strongly, but in Teignmouth neighbours feature more strongly than in Newton Abbot. Unlike Newton Abbot, the Teignmouth network includes individuals with links to numerous other groups, giving the main flood risk community in Teignmouth a higher collective level of CISC than in Newton Abbot.

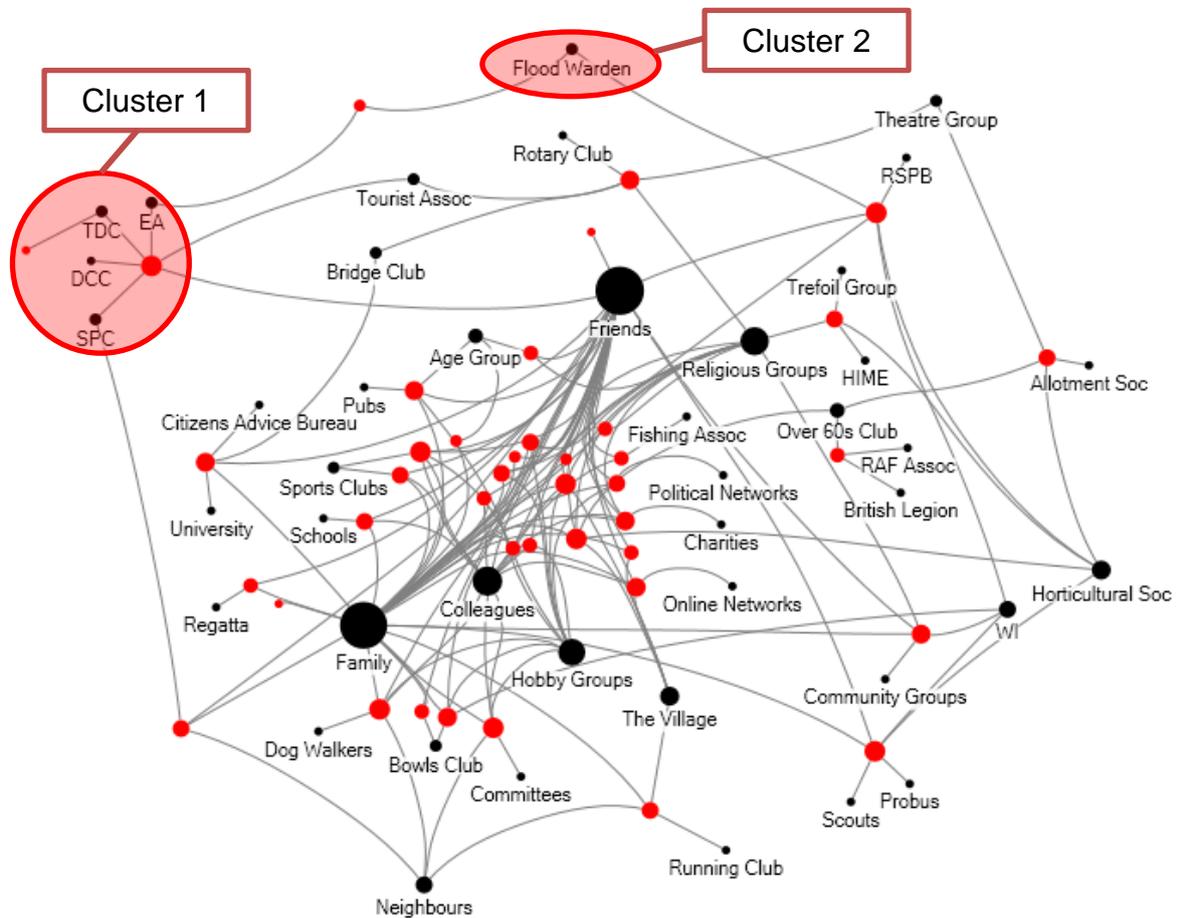
### **6.2.5 CISC in the Shaldon Case Study Community**

In the Shaldon case study community, 42 respondents revealed links to 45 institutions, networks and groups (Figure 6.4). What Figure 6.4 reveals is a distinctly different community in Shaldon to those in Newton Abbot and Teignmouth. The Shaldon community structure most closely resembles the FRM framework sociogram, with all individuals in the community connected in some way (no fragmentation).

Respondents in Shaldon associate themselves with informal and community based groups. Friends, family and colleagues still lie at the core of the community network, but hobby groups and religious groups feature more strongly than in Newton Abbot and Teignmouth. It is difficult to discern any clear clustering of individuals and groups in Shaldon, but two clusters have been highlighted for more detailed examination.

**Cluster 1** – This cluster contains the links to the FRM framework. Importantly, and in contrast to Newton Abbot and Teignmouth, this cluster is well linked to the rest of the Shaldon community (high collective CISC). One individual in particular seems to have derived significant capital from links with organisations in the flood risk management framework (high individual CISC). Of interest too is the fact that the CISC links in this cluster span local, district, county and national levels of the FRM framework. Notable, and in contrast to Newton Abbot and Teignmouth, is that Cluster 1 has links to the local level government institution (SPC). The equivalent institutions in Newton Abbot (NATC) and in Teignmouth (TTC) were not evident in their respective sociograms. The community link to SPC has already been highlighted in Chapters 4 and 5, where SPC was found to have played an important role in helping the Shaldon community to address flood risk issues. It is possible that the failure by the Newton Abbot and Teignmouth flood risk communities to invest in the creation of CISC with their local government institutions is a hindrance to their ability to act on issues to do with flood risk (they need to understand the benefits of the investment as explained by Lin 2001). However, based purely on Putnam's (1993) basis for judging social capital, the CISC allocated to SPC is low, suggesting that CISC alone is not sufficient to judge how influential an institution can be in a community. Such an outcome undermines Lin's four reasons to invest in SC (Lin

2001) as it makes the benefits of such an investment less clear (this is discussed further in Section 6.3).



Vertex colour code	Cluster Legend
Individual <span style="color: red;">●</span>	<b>Cluster 1</b> - individuals with links to FRM institutions
Institution <span style="color: black;">●</span>	<b>Cluster 2</b> – A community based FRM institution
<b>Note:</b> Size of vertex increases in proportion to the number of its links to other vertices	

Figure 6.4 NodeXL sociogram of Shaldon case study community showing sub-clusters

(Source: Shaldon questionnaire survey)

**Cluster 2** – Cluster 2 includes the local flood risk network/group (Flood Wardens). In contrast to Teignmouth, where the Back Beach Group was not connected to the FRM Framework cluster, the Flood Warden group in Shaldon is connected to the FRM framework cluster (suggesting high CISC). However, here again the simple measure of CISC based on the number of connections does not give the Shaldon Flood Wardens any more CISC than the Teignmouth Back Beach Group. The potential to mobilise CISC is much greater in Shaldon compared to Teignmouth because of the links it has to Cluster 1. So here again, the idea of a passive CISC may be helpful, but added to that now is potential CISC. The Shaldon Flood Warden Group has passive and potential CISC, whereas the Back Beach Group has passive CISC only and lacks potential unless further investment in CISC is made. The idea of investing in potential CISC goes some way to reinstate confidence in Lin's four reasons to invest in SC (Lin 2001) that was partially undermined in the evaluation above (Shaldon Cluster 1 analysis) as it supports the case for investment.

### **6.2.6 Lessons learned**

This section set out with great ambition to identify and analyse CISC within the study communities. Its approach was grounded by work of previous researchers in the field (Catts 2007, Haerpfer *et al.* 2005, Koniordos 2005, Lin 2001, Mohan and Mohan 2002, Putnam 1993). Using a simple approach based on Putnam (1993), the author was able to create social network diagrams for each community with an indication of CISC derived from a quantitative analysis of links to each institution in the network. Where links were documented, this approach was able to discern between community to institution type of capital ( $C > ISC$ ) and institution/individual to community type of capital ( $C < ISC$ ). By far the more dominant type in both the FRM

community and the flood risk communities was  $C > ISC$ . In the flood risk communities, this type of CISC was the default as  $C < ISC$  links inevitably lacked documentary evidence.

Where institutions possessed both forms of CISC, they were judged to occupy an active role at the core of the community. Only the FRM community displayed such a core, with most of the other institutions in the FRM community occupying a passive/reactive role in FRM policy development and implementation. The analysis was also able to discern sub-clusters and cliques within the networks. Sub-clusters with no central connecting institution were not judged to be sufficiently cohesive to be classed as a clique, but cliques were evident in both the FRM community and the flood risk communities. The power of the cliques was determined by the extent to which the central institution controlled external access to the members of the clique. In the FRM community, the cliques were weak, but, in the case study communities, cliques were stronger.

In Newton Abbot and Teignmouth, the sub-clusters and cliques were generally disconnected from the main community and this had the impact of weakening the overall CISC of the community. In the FRM community and the Shaldon flood risk community, the collective CISC of the community was high as there was no fragmentation. Fragmentation, as such, was revealed as a significant distinguishing feature of communities with high or low CISC at the collective level.

At the individual level, the analysis was able to distinguish between individuals and institutions with high or low CISC. At this level, however, some caution needed to be expressed as data collected was subjective and only represented a partial picture of the true range of connections possessed by each individual or institution. What was

possible to determine with greater clarity was evidence where links between individuals in the flood risk communities and with FRM institutions did exist. These connections provide a basis from which this thesis can explore the potential to use CISC as a means to enhance community resilience and which will be explored further in the following sections.

## **6.3 Lessons about CISC and other forms of capital from the case study communities**

### **6.3.1 Section outline**

Another issue of importance in this research is the relative significance of CISC to other forms of capital. The issue of “relative significance” is important, as findings from other published research focussing on social capital generally suggest that on its own CISC will not be effective and must be used in conjunction with other capitals (Grew 2001, Rosenband 2001, Rotberg 2001, Dixon 2005 and Kovalainen 2005). Such a suggestion needs to be investigated before any proposals can be developed to promote CISC as a means of improving community resilience. The review of the issues highlighted above will be approached first by reviewing evidence collected from each case study community (Newton Abbot, Teignmouth and Shaldon) separately and then looking at lessons learned from three cases studies collectively. The collective evaluation is split into two parts: the first part will focus on deconflating ideas about CISC and other capitals. The second part will focus on trust, inclusivity, ability to adapt and capacity to engage with issues as indicators of CISC.

### **6.3.2 Flood risk CISC and other capitals in the Newton Abbot case study community**

In Chapter 4, some insights into the role played by social capital and other capitals were revealed. In particular, the community questionnaire survey revealed a low level of engagement in roles relating to flood risk (see Table 4.7 and 4.8). These roles are judged by this thesis to be important in the creation of flood specific CISC, as they act as a focal point for the collection of capitals needed to combat flood risk. Community based flood risk role incumbents may be expected to accrue human capital in the form of knowledge associated with the local flood risk. The role incumbent may also expect to be given responsibility to control physical and economic capital resources used to address local flood risk issues. In addition, the role incumbent would be imbued with cultural capital in relation to flood risk issues and power to direct flood related actions/policies as well as issue sanction/rewards in matters to do with flood risk.

Based on the social network analysis in Section 6.2, it appears that no role with a flood risk focus exists in Newton Abbot. In addition, Newton Abbot also appears to lack a network/group with an interest in flood risk issues. However, Figure 6.1 (above) revealed two potential candidates for such a flood risk management role (individuals A and B in Figure 6.5). Individual A has CISC derived from links to three institutions in the FRM framework. Individual B has CISC derived from links to one FRM framework institution and links to friend and family networks. However, neither individual provided evidence that they had any interest in flood risk issues. Hence, flood risk CISC may be judged to be low. Haerpfer *et al.* (2005) would suggest that it will be difficult for Newton Abbot to create new flood risk CISC. As a minimum, the

Newton Abbot community would need to invest in the creation of a flood risk group and try to encourage individuals A and B to join the group, as indicated in Figure 6.5.

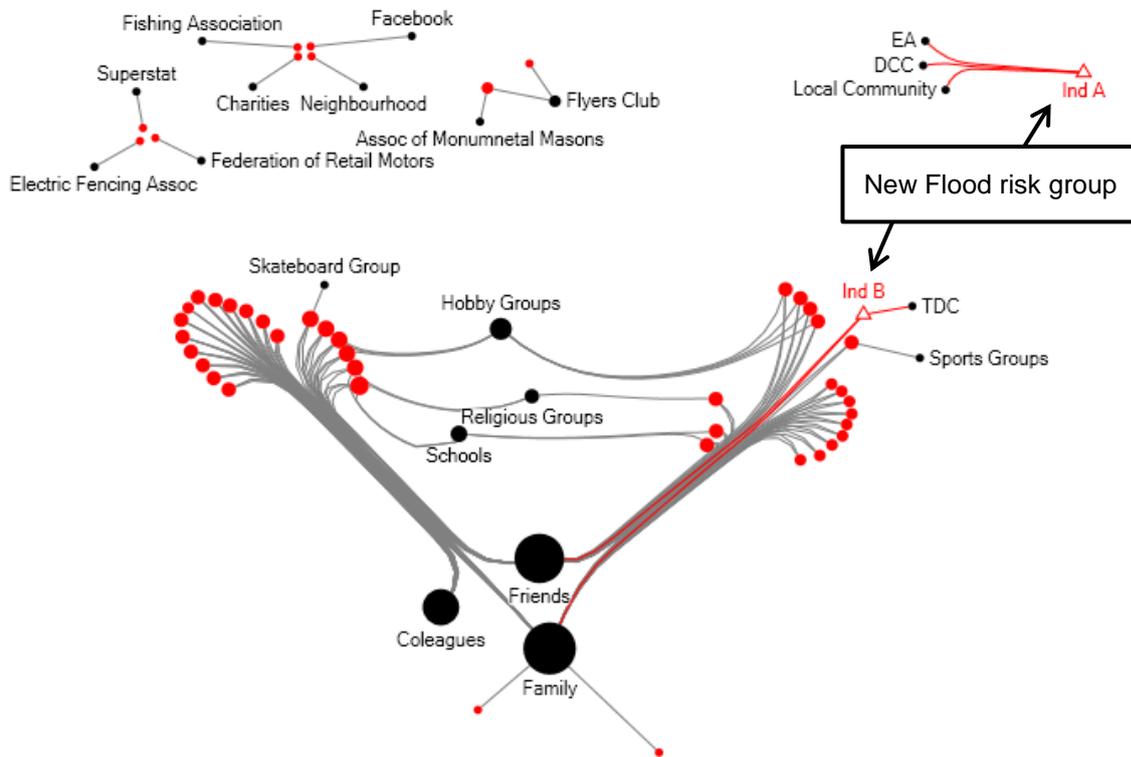


Figure 6.5 NodeXL diagram showing individuals in Newton Abbot with links to the FRM Framework

(Source: Author)

From the Newton Abbot case study, it is easy to understand that, when existing CISC is low, it will be difficult to create new capital. The lack of a local flood risk group and the lack of a role with an incumbent to coordinate local flood risk action also hampers the ability of the community to create the other forms of capital needed to successfully address the threat of flooding.

### **6.3.3 Flood risk CISC and other capitals in the Newton Teignmouth case study community**

In contrast to Newton Abbot, a group with a flood risk focus did exist in Teignmouth, the “Back Beach Group” (Figure 6.3 above). Two well-connected individuals had CISC with links to the Back Beach Group (individuals A and B in Figure 6.6), but their capital resources were limited to what they and the local community could provide. Individuals A and B did not reveal connections to the FRM framework. However, two other individuals (individuals C and D in Figure 6.6) did have CISC derived from links to the FRM framework, but they did not indicate any specific interest in flood risk issues. It is possible to conceive that individuals A and B possess cultural capital in relation to flood risk management, but their flood risk CISC is low and limits the potential of the cultural and other capitals to develop.

Individuals C and D have high potential flood risk CISC, but it has not yet been developed. It would be relatively easy for the Teignmouth community to create more flood risk CISC by encouraging individuals C and D to links with the Back Beach Group (see essential new links in Figure 6.6). The Back Beach Group could then gain access to the considerable human, physical and economic resources held by organisations in the FRM framework. The Back Beach Group would also gain considerable cultural capital from its new CISC. However, individuals C and D would not be the best choice to champion flood risk issues in the community.

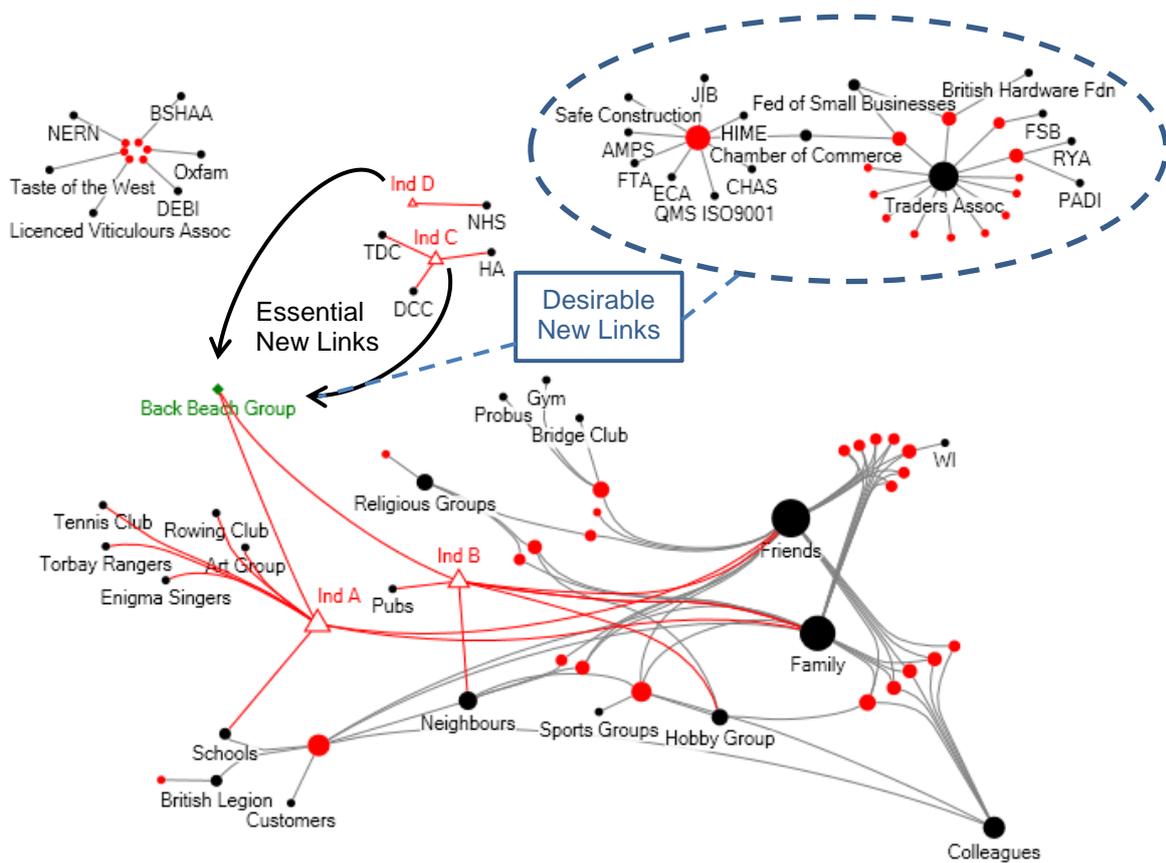


Figure 6.6 NodeXL diagram showing individuals in Teignmouth with links to the FRM Framework and interests in flood risk issues

(Source: Author)

Individuals A and B have better links to the community and would be better placed than individuals C and D to champion flood risk issues within the community. That said, access to the FRM framework capital resources would be controlled by individuals C and D, which has the potential to limit the power and influence of individuals A and B (and thus limit their potential cultural capital). This analysis is helpful in understanding how CISC operates in parallel with other capitals and not at another level (Kovalainen 2005).

The Teignmouth community has another feature that should not be overlooked, namely a separate clique that is distinct from a large part of the community.

Proposals to link individuals C and D to the Back Beach Group will not address the separation of the main community from the Traders Association clique. As long as the clique remains separate from the main community, the capacity of the community to collectively address local flood risk issues will be limited.

Evidence from the questionnaire survey suggests that the Traders Association clique possesses little human, physical or economic capital resources focussed on flood risk management. However, the Traders Association clique does have high social capital and, if the high social capital is converted to flood risk CISC by investing in links to the Back Beach Group (see desirable new links in Figure 6.6), the capacity of the community to deal with flood risk issues will be greatly increased. Such an approach may have a negative consequence for individuals A and B, as they are not part of the Traders Association clique, their power and authority in relation to championing flood risk issues would be further diminished.

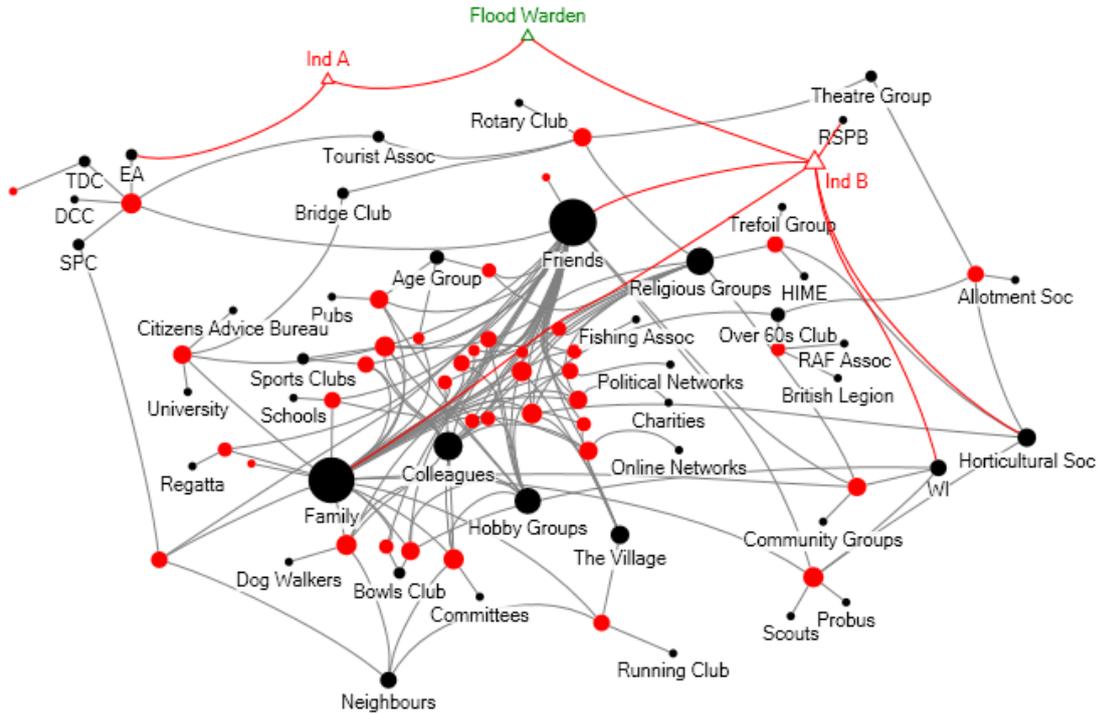
The Teignmouth analysis sheds more light onto the reasons why it is difficult to create new CISC where existing stocks are low, but easier where it is high (Haerper *et al.* 2005). The first proposal, to create new flood risk CISC by investing in new links between individuals C and D, the Traders Association Clique and the Back Beach Group could be seen as quite easy to achieve. The ease is evident because the Back Beach Group already exists and a new group does not need to be created (unlike in Newton Abbot). However, considerable difficulty could be encountered, not just in convincing parties to link to the Back Beach Group, but from the existing members of the Back Beach Group. Specifically, individuals A and B would see their power and influence within the Back Beach Group diminishing. As such, individuals A and B could resist the creation of new flood risk CISC. It is possible that a new role

would need to be created and a role incumbent selected who is trusted by all parties (old and new). The role incumbent would need to ensure that the views of all sub-groups were properly taken on board and that the benefits of being a member of the Back Beach Group are equally shared to all (significant in resilience building, see Chapter 7 for further discussion).

#### **6.3.4 Flood risk CISC and other capitals in the Shaldon case study community**

In Shaldon, as in Teignmouth, a group with a flood risk focus was revealed by the community survey. The group was linked to a “Flood Warden” scheme being operated in Shaldon. The Flood Warden Group was connected to both the local community and the FRM framework. As with both Newton Abbot and Teignmouth, no survey respondents identified a formal role for dealing with flood risk issues in the community, but two candidates with good potential to occupy the role were highlighted (individuals A and B in Figure 6.7).

Individual A possessed flood risk CISC and had links that bridged the gap between the Flood Warden Group and the FRM framework. Individual A could acquire significant flood risk capital for the community by accessing the vast store of human, physical and economic resources in the FRM framework. However, individual A had few links to the rest of the Shaldon community, which diminishes the potential to acquire flood risk cultural capital from the community.



**Figure 6.7 NodeXL diagram showing individuals in Shaldon with links to the FRM Framework and interests in flood risk issues**

(Source: Author)

individual B possessed similar flood risk CISC and had strong links to the local community. Individual B had higher potential to acquire flood risk cultural capital than individual A due to a much higher levels of connections to the Shaldon community. However, levels of human, physical and economic capital to tackle flood risk issues available to individual B were limited to that which the individual and the community could provide. The limited capital resources accessible to individual B would diminish the potential cultural capital individual B may acquire if appointed to a formal flood risk role in the community.

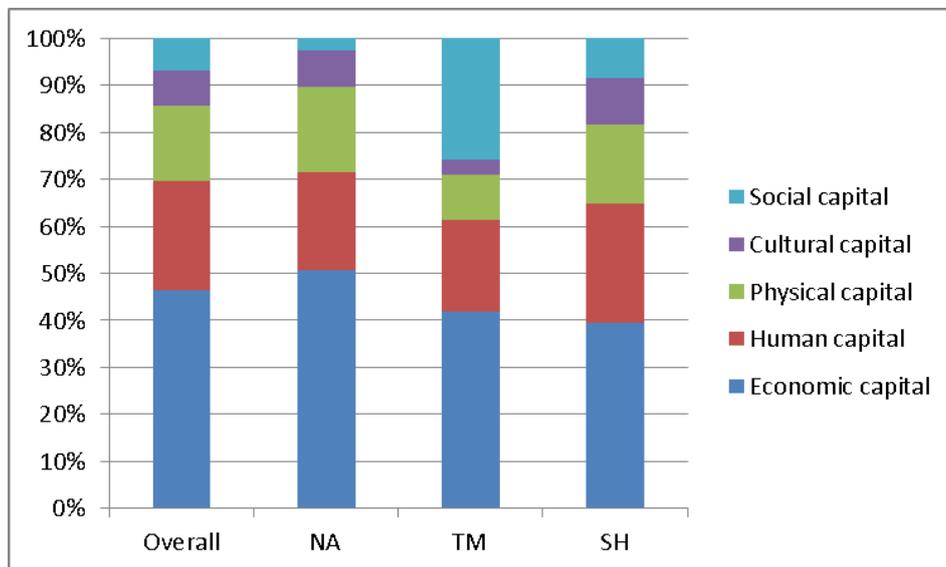
Between the individuals A and B, high levels of flood risk CISC could be acquired, together with high levels of other capitals to tackle flood risk issues, engaging both the FRM framework and the local community. What is less clear is which individual is best placed to occupy the flood risk management role. With the role would come ownership of the main share of flood risk cultural capital, essential if the role incumbent wishes to influence the way the community takes action on the flood risk threat. That being said, the positive point to note is that there are options available in Shaldon, so should the community wish to invest in such a role, then there are already two well-placed candidates in existence. The latter point helps to build an understanding of why, when social capital is high, it is easy to create new capital (Haerpfer *et al.* 2005).

### **6.3.5 Deconflating ideas about CISC and other capitals**

In an effort to assess the relative significance of CISC to other capitals, questionnaire survey respondents were asked a series of questions about capitals that they would use to recover from flood events. At an individual level respondents were asked what capital resources they had to help them recover from a flood. Economic capital was the top ranked capital, followed by human, physical, cultural and finally social capital (Figure 6.8).

Consistently, across all three study sites, social capital was the lowest ranked capital, listed by only 7% of respondents. The pattern of capital distribution in Newton Abbot and Shaldon were similar, representing areas with a bias towards resident responses. However, in Teignmouth, there was a bias towards organisational responses and there social capital was ranked much more highly, second behind economic capital. This suggests that within the organisational clique in Teignmouth

(identified in Figure 6.3 and further annotated in Figure 6.6), there is a stronger recognition of the value of social capital compared to the resident population. The implication is that, in Teignmouth, investment in flood risk CISC may be regarded as more value than in Newton Abbot and Shaldon, making it potentially easier to engage the organisational clique by investing in flood risk CISC. It is also possible that, as the Teignmouth clique is highly institutionalised, the institutionalisation process raises the profile of social capital as a valuable resource.

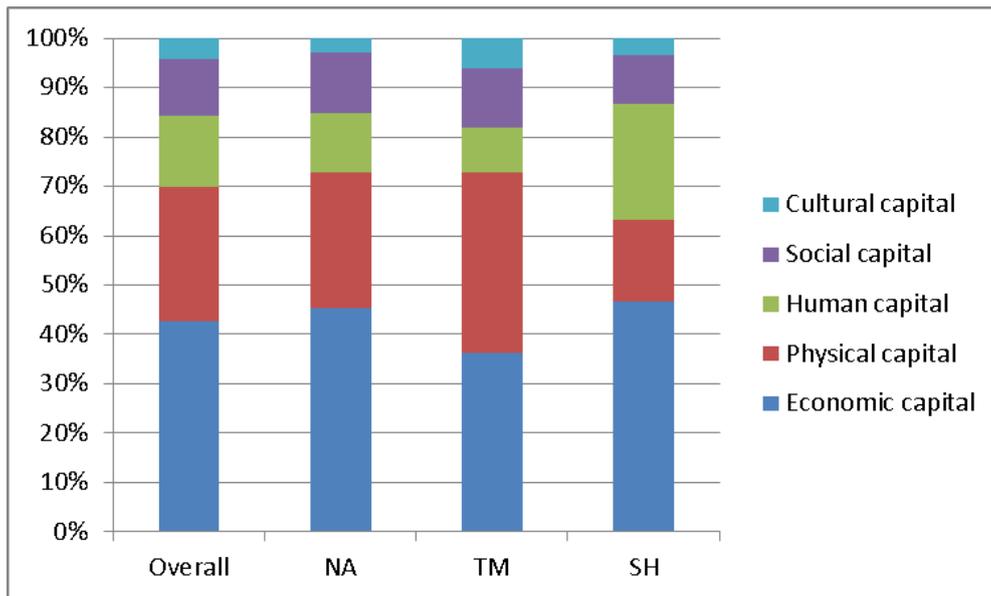


	Overall		NA		TM		SH	
Economic capital	93	46.50%	39	50.65%	26	41.94%	28	39.44%
Human capital	46	23.00%	16	20.78%	12	19.35%	18	25.35%
Physical capital	32	16.00%	14	18.18%	6	9.68%	12	16.90%
Cultural capital	15	7.50%	6	7.79%	2	3.23%	7	9.86%
Social capital	14	7.00%	2	2.60%	16	25.81%	6	8.45%
<b>Total</b>	<b>200</b>		<b>77</b>		<b>62</b>		<b>71</b>	

**Figure 6.8 Capital resources held by survey respondents to help them recover from a flood event**

(Source: Author)

Respondents were also asked which resources they would use first in the event of a flood. In this case, economic capital resources were still the most popular choice. Economic capital in these responses was equally split between insurance and cash in bank accounts. Second ranked were physical capital resources, followed by human capital, social capital and finally cultural capital (Figure 6.9).



	Overall		NA		TM		SH	
Economic capital	41	42.71%	15	45.45%	12	36.36%	14	46.67%
Physical capital	26	27.08%	9	27.27%	12	36.36%	5	16.67%
Human capital	14	14.58%	4	12.12%	3	9.09%	7	23.33%
Social capital	11	11.46%	4	12.12%	4	12.12%	3	10.00%
Cultural capital	4	4.17%	1	3.03%	2	6.06%	1	3.33%
<b>Total</b>	<b>96</b>		<b>33</b>		<b>33</b>		<b>30</b>	

Figure 6.9 Capital resources that would be used first in response to a flood event

(Source: Author)

Social capital is elevated above cultural capital when considered as a first choice resource, suggesting that cultural capital was held as the most precious resource and only spent as a last resort. Here again, Teignmouth respondents were noticeable by placing much more emphasis on physical capital resources than the other two case study sites. This is possibly linked to the familiarity organisations

have in utilising physical resources (more than residents). Again the institutionalisation process may give the Teignmouth community more confidence when mobilising physical resources. Also interesting in this response is that more respondents in Shaldon chose human resources before physical resources. It is possible that the well-connected networks in Shaldon (Figures 6.4 and 6.7 above) make the mobilisation of human capital resources easier than in Newton Abbot and Teignmouth. In this respect, social capital has a hidden benefit, not recognised by the community itself.

At the community level, respondents were asked if local businesses or organisations had resources that may help the community recover from a flood event. The overwhelming response was “no” or “don’t know”, which reveals that whilst individual levels of capital were evident and easily deconflated, at the community level there was significant lack of awareness of resources, making deconflation difficult to achieve. To Adger (2000) and Rotberg (2001), this may be evidence that the communities were focussed on actions aimed at the individual good and not towards the collective good, which may have implications for the development of resilience in the communities (see Chapter 7 for more detailed discussion).

When asked if the communities had any plans to acquire more resources to better protect itself from the risk of flooding, a total of 49 responses were received (NA 4, TM 27, SH 18). The responses could be clustered into two broad categories. The first category includes economic and physical capital (flood protection scheme, sand bags and storage) and accounted for 82% of responses. The second category included human and social capital (discussion, emergency planning) with 14% of

responses. A minority (in Shaldon) suggested there was no plan – as all work had been done (4%) (Figure 6.10).

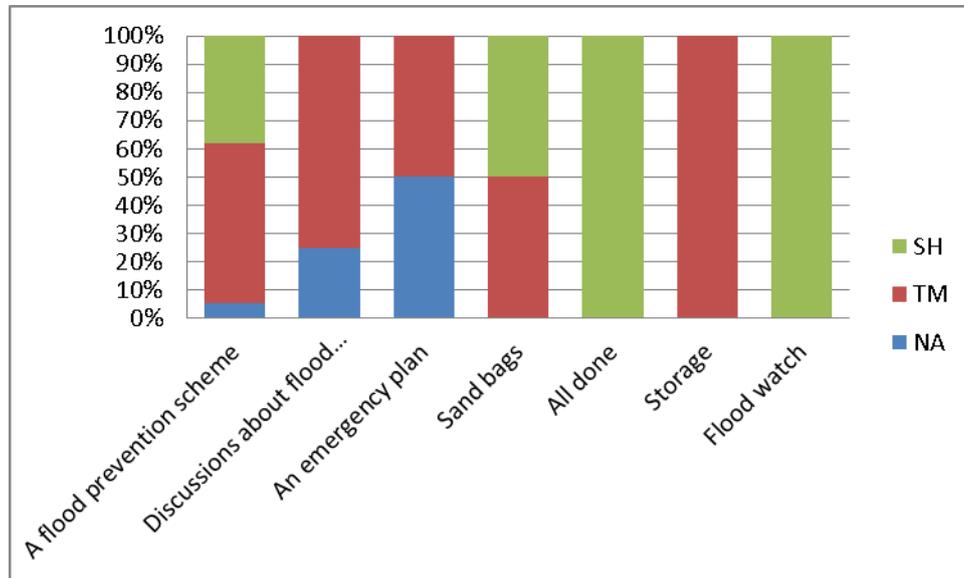


Figure 6.10 Plans by the community to acquire more capital resources to deal with the local flood risk

(Source: Author)

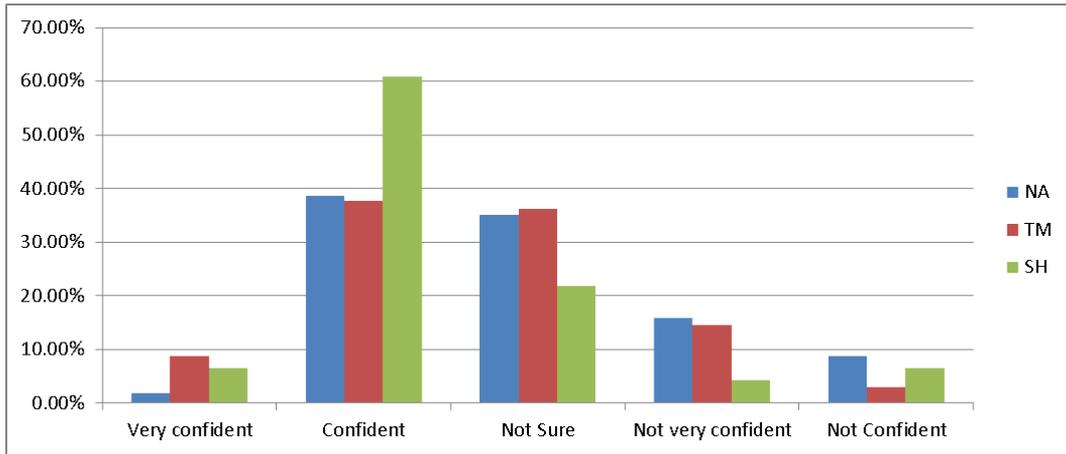
Although the number of responses was relatively low (very low in Newton Abbot), it is interesting to compare the focus for investment in Teignmouth and Shaldon. In Teignmouth, the community exposure to flood risk was high, whereas in Shaldon the community was in the process of having a new flood wall constructed. In Teignmouth, the focus for future investment was in discussions about flood risk issues, emergency planning and the procurement of high cost physical resources. In Shaldon, the focus was on low cost physical resources and investment in human capital (personified by flood wardens). In Shaldon, further discussion about flood risk and planning for future flood events was not evident. Worryingly for resilience planners in Shaldon was that some residents were of the belief that “flood risk is no longer an issue”. That is worrying because the effect of flood defence measures

having an inoculating effect on local populations is an issue that has been documented by resilience researchers and can lead to harmful mindsets that ultimately lowers resilience (covered in more depth in Chapter 7).

### **6.3.6 Trust, inclusivity, ability to adapt and capacity to engage with issues as indicators of CISC**

Trust, inclusivity, the ability to adapt and a capacity to engage with flood risk issues are all indicators of strong social capital (Adger 2000, Rotberg 2001, Radcliffe 2004, and Dixon 2005). As part of the community survey, respondents were asked a series of questions that aimed to assess these traits. To start, individuals were asked how confident they were that they could withstand a future crisis incident such as a flood. Generally, individuals across all three case study communities revealed a reasonably confident response, but respondents in Shaldon showed the highest level of confidence (Figure 6.11).

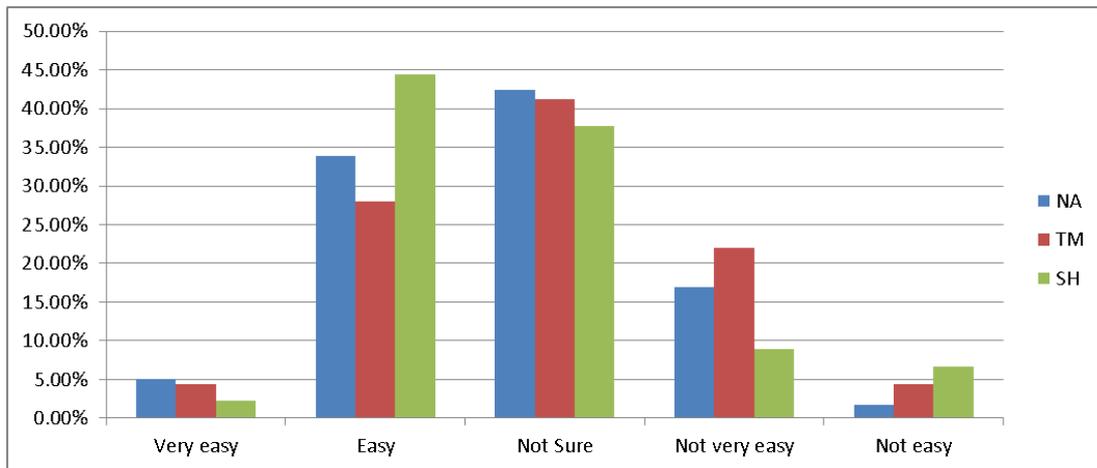
Respondents were also asked how easy it would be for them to adapt to the hazards that cause crisis incidents in their lives, such as flooding. In this case, the responses were slightly less confident, but again the Shaldon community demonstrated the highest level of confidence in being able to adapt to hazards (Figure 6.12).



	Very confident	Confident	Not Sure	Not very confident	Not Confident	Total
NA	1	22	20	9	5	57
TM	6	26	25	10	2	69
SH	3	28	10	2	3	46
<b>Total</b>	<b>10</b>	<b>76</b>	<b>55</b>	<b>21</b>	<b>10</b>	<b>172</b>

**Figure 6.11 Confidence of case study survey respondents in their ability to withstand a future crisis incident such as a flood**

(Source: Author)



	Very easy	Easy	Not Sure	Not very easy	Not easy	Total
NA	3	20	25	10	1	59
TM	3	19	28	15	3	68
SH	1	20	17	4	3	45
<b>Total</b>	<b>7</b>	<b>59</b>	<b>70</b>	<b>29</b>	<b>7</b>	<b>172</b>

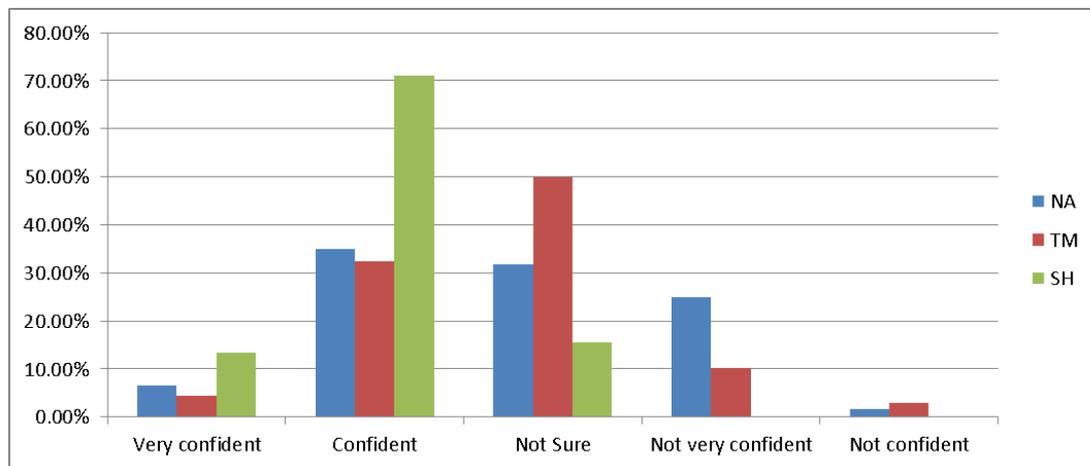
**Figure 6.12 Community survey respondents' measure of ease in adapting to hazards that cause crisis incidents, such as flooding**

(Source: Author)

The survey then asked respondents how confident they were that the local community could cope with a future flood event. A similar pattern of responses to the

individual level questions was achieved, with Shaldon community respondents indicating the highest level of confidence in the community’s ability to cope with a future flood event. In Shaldon, respondents were more confident in the community coping capacity than they were about their own individual coping capacity. In Teignmouth, respondents were less sure about the community’s ability to cope, signified by an increase in ambiguous responses to survey questions (Figure 6.13).

Respondents were also asked how well they thought the community understood the local flood hazard. Again, the Shaldon community demonstrated significant confidence in the community level understanding of the local flood hazard. In Teignmouth (and in contrast to Figure 6.13), respondents demonstrated a good level of confidence in the community level understanding of the flood hazard (Figure 6.14).

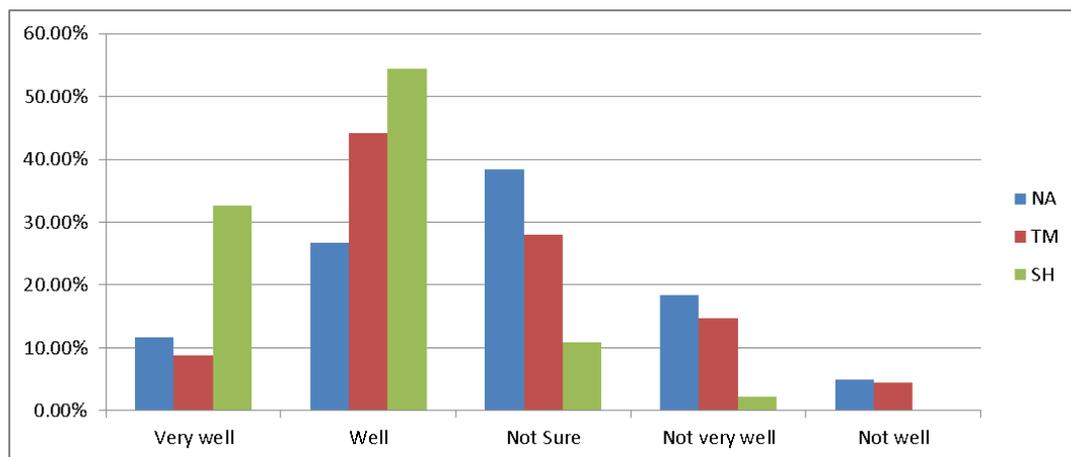


	Very confident	Confident	Not Sure	Not very confident	Not confident	Total
NA	4	21	19	15	1	60
TM	3	22	34	7	2	68
SH	6	32	7	0	0	45
<b>Total</b>	<b>13</b>	<b>75</b>	<b>60</b>	<b>22</b>	<b>3</b>	<b>173</b>

Figure 6.13 Survey respondents’ confidence that the community would be able to cope with a future flood event.

(Source: Author)

Overall, Newton Abbot respondents did have a net-positive perception of the community level understanding of the local flood hazard. In addition, in Newton Abbot, opinion on the ability of the community to cope with a future flood event was more divided than in Shaldon and Teignmouth.

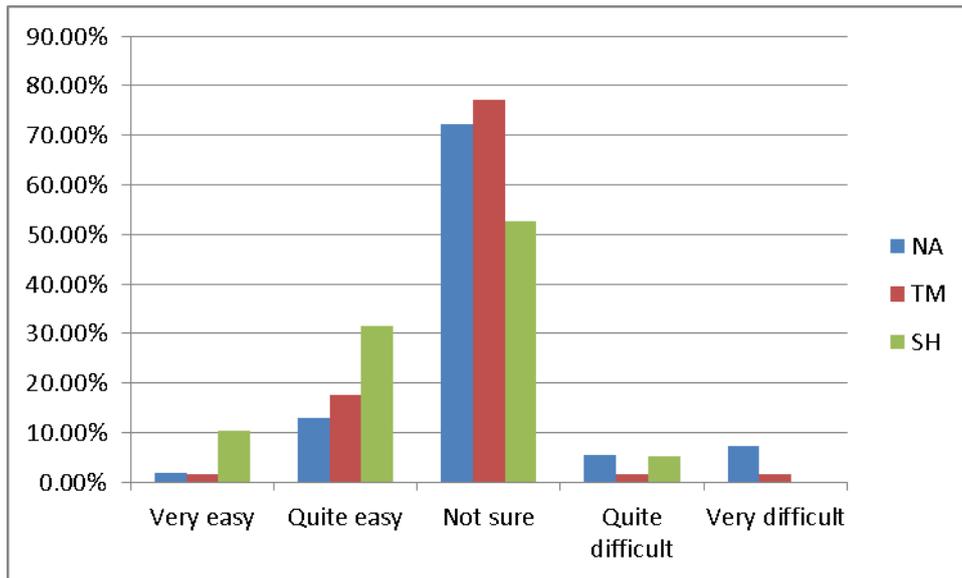


	Very well	Well	Not Sure	Not very well	Not well	Total
NA	7	16	23	11	3	<b>60</b>
TM	6	30	19	10	3	<b>68</b>
SH	15	25	5	1	0	<b>46</b>
Total	<b>28</b>	<b>71</b>	<b>47</b>	<b>22</b>	<b>6</b>	<b>174</b>

Figure 6.14 Survey respondents' perception of community level understanding of the local flood hazard.

(Source: Author)

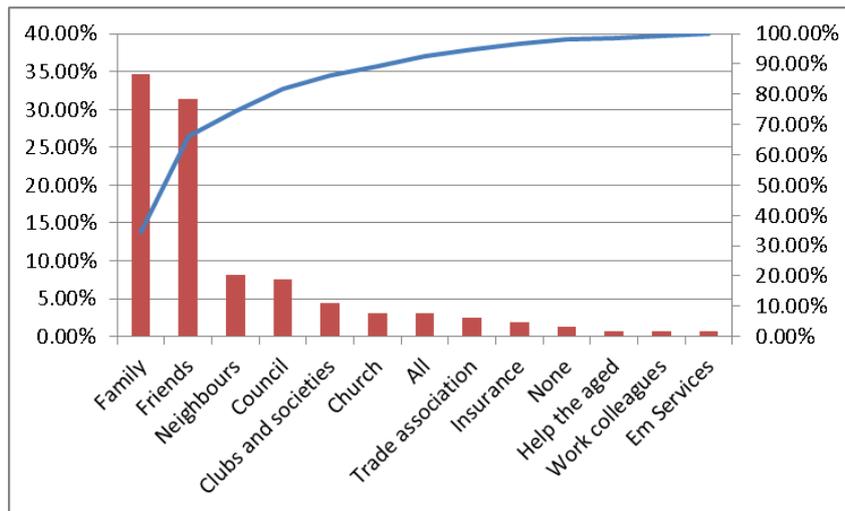
As part of the questionnaire survey, respondents were also asked how easy it would be for the community to mobilise its resources to help it recover from a flood event. At this point, all three communities struggled to make a judgement and all three indicated strongly that they were not sure how easy it would be (Figure 6.15). A similar pattern of responses was provided when respondents were asked how easy it would be for local businesses and organisations to mobilise their resources to help the local community recover from a flood event (no figure shown).



**Figure 6.15 Survey respondents' perception of community level ability to mobilise resources to aid recovery from a flood event.**

(Source: Author)

In a turn towards understanding which local networks respondents trusted to provide them with assistance in the event of a flood, the overwhelming majority of respondents identified friends and family as the first networks they would turn to for assistance (see Pareto Analysis of results in Figure 6.16). Some way behind those first two networks were neighbours and the local council. The local council is the main link to the FRM framework, so it is interesting that it ranked fourth, a long way behind the friends and family. This result suggests that in the first instance communities would turn to individual resources to help them cope with a flood event before turning to community level resources. Flood risk in this regard may be being viewed as a personal issue, rather than a collective issue, which may undermine efforts to promote community level action to address flood risk, unless efforts are personalised to make benefits apparent to individuals.

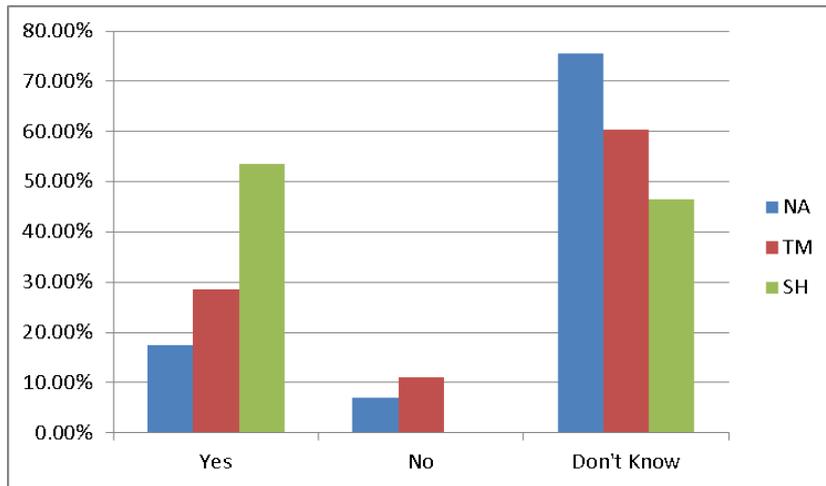


**Figure 6.16 Pareto Analysis of Networks/Groups survey respondents would turn to for assistance in the event of a flood**

(Source: Author)

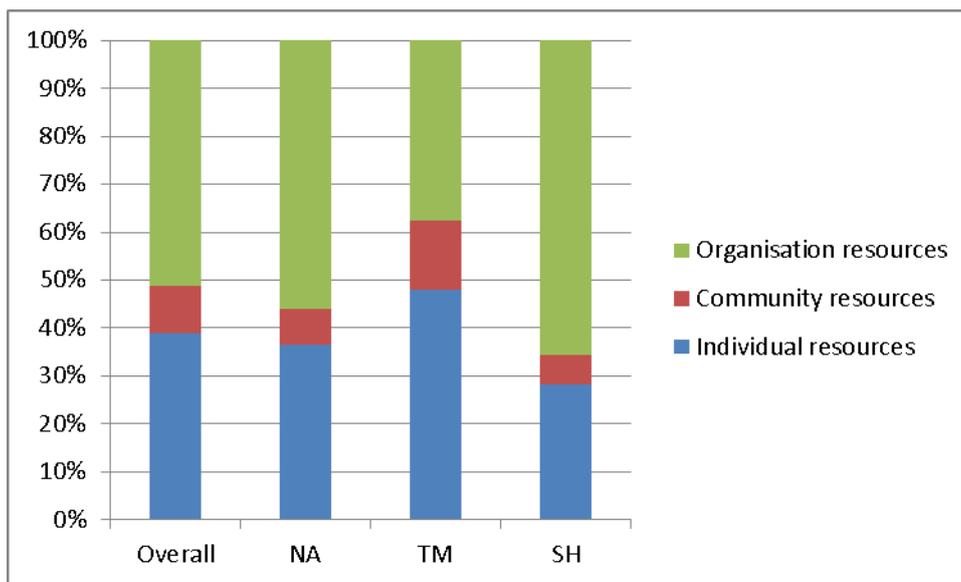
By way of seeking some clarification on the ability of local community groups to provide assistance in time of flood, respondents were asked; “if the local community was the victim of a flood, do you consider that local community groups would be able to provide help to the flood victims?” In Shaldon, opinion was divided, but the majority did indicate some confidence that local community groups would be able to provide assistance to victims of a flood. However, in Teignmouth and Newton Abbot respondents were more pessimistic about the ability of local community groups to provide assistance to flood victims (Figure 6.17).

Finally, respondents were asked which level of resources were least and most effective in helping the community recover from a flood event. In all cases, the most effective level of resource was judged to be community level resources. In Newton Abbot and Shaldon (where resident responses dominated), organisational resources were judged to be least effective. In Teignmouth (where organisational responses were strongest), Individual resources were deemed to be least effective (Figure 6.18).



**Figure 6.17 Community survey responses to question “If the local community was the victim of a flood, do you consider that local community groups would be able to provide help to the flood victims?”**

(Source: Author)



	Overall		NA		TM		SH	
Individual resources	47	38.84%	15	36.59%	23	47.92%	9	28.13%
Community resources	12	9.92%	3	7.32%	7	14.58%	2	6.25%
Organisation resources	62	51.24%	23	56.10%	18	37.50%	21	65.63%
<b>Total</b>	<b>121</b>		<b>41</b>		<b>48</b>		<b>32</b>	

**Figure 6.18 Survey responses indicating the perception of least effective resources in helping the community recover from a flood event**

(Source: Author)

These last two figures are interesting because they show that respondents recognised the benefits of collective action over individual action to address flood risk. However, data presented earlier revealed little or no action to acquire and organise resources at the collective level. In this case, it is possible that the absence of any imminent threat of flooding and the long time elapsed since the last recorded flood in any of the three case study communities has diminished the collective interest in matters to do with flooding. In Shaldon, where flood risk defences were actively being built, these data suggests that the local community would not have taken action to mitigate the impact of future flood events if the EA had not approached the community and largely coerced them into accepting the new flood defence scheme. Indeed, efforts to coerce the Teignmouth community initially failed (see Chapter 4), and it was only after a “near miss” flood event in 2004 that collective action in Teignmouth began to coalesce.

### **6.3.7 Lessons learned**

This section sought to deconflate ideas about social capital from other capitals and the results uniformly demonstrated that social capital was ranked lowest of all the capitals by the surveyed populations. In all cases, economic capital was ranked highest and the capital of first recourse in the event of a crisis. Cultural capital was ranked more highly than social capital, but was less likely to be spent on tackling flood risk issues. Within institutionalised populations, social capital was judged to be of greater value than physical and cultural capital when tackling flood risk and institutionalised populations had a greater confidence in their ability to mobilise physical resources. Uninstitutionalised populations (residential populations) generally lacked the confidence of being able to mobilise community resources effectively.

However, where social capital was high, the confidence of uninstitutionalised populations to mobilise human capital was also high. As such, social capital is revealed as a largely hidden, or less well recognised, capital resource in areas where any degree of institutionalisation is absent. These findings reveal that when this thesis develops proposals to use CISC as a means to enhance community resilience, those proposals must be accompanied by efforts to undertake some degree of institutionalisation in order to maximise their effectiveness.

When looking at trust, adaptability and coping capacity, survey respondents were more confident in the collective community capacity to deal with a flood event, than with their individual capacity. However, a paradox was highlighted here in that, whilst community or institutional level resources were regarded as most effective in dealing with the local flood risk, respondents prioritised the use of personal resources when tackling flood risk. The confidence (or trust) in the capacity of the community to cope with a flood event may thus be a false hope expressed by survey respondents. Any real hope would be misplaced, as there was little evidence from the populations of collective action to improve capital stocks in order to address the local flood risk. In addition, confidence in the ability of local community groups to assist in times of flooding was not uniformly positive. In this case, it is possible that the absence of any imminent threat of flooding and the long time elapsed since the last recorded flood in any of the three case study communities has diminished the collective interest in matters to do with flooding. That lack of interest has made judgements about the collective ability of the community to address a future flood event overly optimistic.

By way of addressing any misplaced optimism in the community coping capacity, and by way of formulating effective proposals to enhance community resilience, the

author suggested that some degree of institutionalisation to create a community based FRM role would be useful. The effect of institutionalisation would increase the value ascribed to CISC and the role would also act as a focal point for the deposition of other capitals useful in assisting the community when dealing with the local flood risk. Analysis of the different flood risk communities illustrated the challenges inherent in creating such a role, from the lack of sufficient existing capital to the threat such a role would pose to existing groups and power structures in the community. In essence though, such a role was judged to need a local community flood risk group in order to be enacted effectively. In addition, the role incumbent should be carefully chosen, as someone trusted by all sub-sections and cliques within the community. The role incumbent would also need to ensure that the benefits of such an investment by the community are equally shared to all. If such a structure was created, then flood risk CISC could be acquired, together with high levels of other capitals to tackle flood risk issues and engagement. In addition, and with particular relevance to this thesis, the capacity to create CISC links to the FRM framework would be greatly enhanced.

## **6.4 CISC and the importance of a stable institutional framework**

### **6.4.1 Section outline**

According to Rosenband (2001), the long-term stability of a policy framework is important for the creation of social capital. During periods of stability, social capital can be “incubated”, but in times of upheaval (or when conflict erupts) social capital reserves are depleted (Adger 2000, Radcliffe 2004). During the time that this research was being undertaken, a raft of new FRM policies and legislation were put into force. The new policies and legislation drive changes that have a significant

impact on FRM institutions operating at the sub-regional level of the FRM framework. Although data are limited, due to the on-going nature of the changes, some pattern to the impact of changes on the FRM framework was evident from the institutional interviews. This section provides a short analysis of the on-going changes and their projected impacts on capital reserves in the FRM institutions most directly connected to the case study communities. The analysis provides the basis for an assessment of the implications the changes may have on the proposals developed by this thesis.

#### **6.4.2 Changing capital reserves in FRM institutions engaged with the case study communities**

The latest changes within the FRM framework came into effect between 2010 and 2012 and were introduced after the Pitt Review (2008), which sought to learn lessons from floods that occurred in 2007. Interview evidence presented in Chapter 4 indicated that some instability has occurred in the FRM framework after the introduction of the latest changes. Here some further analysis reveals how the latest changes within the FRM framework are shifting the balance of capitals at different levels of the framework:

1. **Town and Parish Councils** – were described as possessing very high social capital, but low human capital in relation to flood risk. They also have low physical and economic capital to deal with local flooding issues, but high cultural capital within their respective communities. New policies and legislation are forcing them to take on more responsibility and they are doing so by creating CISC with some local FRM institutions (Interviews 2 & 3)
2. **The District Council** – TDC is described as having high CISC and an unusually high level of flood risk human capital. The flood risk human capital is derived from several decades of involvement in flood risk management. However the FRM role of TDC is changing, with responsibility pushed both up to County level and down to Town/Parish level. TDC was losing human, physical and economic capital and will possibly lose some of its currently high level of flood related cultural capital as a consequence (Interview 1 & 2)

3. **The County Council** – DCC has traditionally had low FRM CISC, but had recently acquired new human, physical and economic capital to address flood risk issues. The new capitals were judged to be limited at present and will limit the level of flood related cultural capital that may be accrued by DCC if resources are not increased in the future (Interviews 1 & 4)
4. **Regional bodies** - All capitals were described as adequate to deal with flood risk issues and remaining stable going forward (Interview 5)
5. **The EA (representing National Level)** - was identified as the main national level institution from the FRM framework with regular input at sub-national levels. The EA was judged to have high CISC and high reserves of all other capitals in flood risk issues (All interviews)

Details gathered from the interviews conducted for this research have been summarised in Table 6.1 to show how changes to the FRM framework are changing the distribution of capitals throughout the framework.

**Table 6.1 Capitals in the FRM Framework and trends arising from recent changes to the system for managing flood risk in the UK.**

(Source: Author)

FRM Framework Entity	Capitals assessed in relation to use in addressing flood risk				
	CISC	Human	Physical	Economic	Cultural
Town / Parish Council (various)	L Rising	L Rising	L Stable	L Stable	L Rising
District Council (TDC)	H Dropping	H Dropping	H Dropping	H Dropping	H Dropping
County Council (DCC)	M Rising	M Rising	M Rising	M Rising	M Rising
Regional Body (D&CC)	M Stable	M Stable	M Stable	M Stable	M Stable
National Body (EA)	VH Stable	VH Stable	VH Stable	VH Stable	VH Stable

Key: L=Low, M=Moderate, H=High, VH=Very High

### **6.4.3 Assessing the impact of FRM changes on proposals to use CISC as a means to enhance community resilience**

Lin (2001) was helpful in pointing out that disruption in the institutional framework can lead to variations in the distribution of benefits between institutions in the framework. The consequence is that variations may be construed by some within the framework as exploitation, thus undermining the social cohesion in the network (Rosenband 2001, Mohan and Mohan 2002, Catts 2007). As the national level has loosened its grip on flood risk management institutions, the impact has been felt at all levels. The EA has gained considerable capital and recent changes to the FRM framework have not significantly impacted on its potential to sustain its capital reserves. Despite huge changes to regional governance structures, the regional level has remained stable and continues to play an important role in local FRM policy development. The big winner in the recent changes to the FRM framework has been the county council. DCC is projected to see rising levels of capital and status in the FRM framework.

The rise in county level capital stocks has come at the expense of the district, where capital levels have historically been high, but are dropping as a consequence of policy changes. At the local level the picture is mixed, with CISC, human and cultural capitals in relation to flood risk rising, but physical and economic capitals remaining stable. Traditionally the local level had low overall flood risk capitals and these changes are meeting with some resistance. In particular the local level feels coerced into acquiring more flood specific human and cultural capital, but has seen no commensurate rise in physical and economic capital.

This analysis is mindful of the challenge that Radcliffe (2004) found, namely that the use of social capital to further political and policy agendas runs contrary to cultural heritage of many institutions. At the local level, CISC with the FRM framework has historically been low, and efforts to build CISC at the local level may be viewed as contrary to their cultural heritage. Pressure on local institutions to invest in CISC may, as a consequence, meet with indifference or even open hostility (ibid). All interviews provided evidence of resistance to this cultural change from local level institutions, either in the form of apathy to proposals or in the form of professional ineptitude when dealing with FRM issues.

Indifference or hostility to the development of CISC, due to its alien character compared to existing cultures within institutions, could seriously undermine efforts to improve resilience by promoting CISC. Putnam (1993) and Coleman (1990) pointed out that social capital is only really created when links between agents result in some form of reciprocity. Only Shaldon demonstrated any evidence of having invested in flood risk specific CISC, and this investment had paid dividends for the local community who had secured considerable physical and economic investment from the EA. In this case, both the EA and Shaldon can be seen to have received reciprocal benefits: the EA having successfully implemented a flood protection scheme (after having their proposal for Teignmouth rejected) and the local community having received a considerable capital investment. The Shaldon case is also a good example to support the findings of Barton *et al.* (2007) who found that the creation of social capital has a therapeutic effect, reducing mutually destructive competition that changes to the ideological structure can create. In the Shaldon case, the local community was initially hostile to the approach from the FRM institutions,

but as CISC links were created an effective working relationship was established and remains on-going.

### **6.4.3 Lessons learned**

In this brief review of on-going changes to FRM policy, the author has engaged in some speculation as to the future impact the changes may have on FRM institutions. Change is generally regarded as a continuous process, so such speculation was ultimately going to be necessary when it came time to formulate proposals within this thesis. What the speculation suggests is that proposals to use CISC as a means to enhance community resilience in the flood risk communities must work to enable communities and FRM institutions to exploit potential opportunities and avoid wasteful expenditure on CISC that will not deliver long-term benefits.

For Parish and Town councils, proposals need to address the perceived imbalance between new FRM responsibilities and shortfalls in economic and physical capital stocks. Proposals should also build upon the increasing level of human and cultural capital that is being developed as local institutions continue to explore their new role in the FRM framework.

At the district level, proposals developed for this thesis should stress the need to reduce local institutional reliance on District level. This is particularly relevant in the Teign Estuary communities because TDC has traditionally had an unusually high level of flood specific capital. However, in the long-term, TDC is set to lose much of its flood related capital reserves. For the short-term, the district can facilitate the creation of CISC links to other parts of the FRM framework, where local institutions may be able to secure access to needed resources.

Teign Estuary local community institutions need to be directed to build long-term CISC links at the county level. As the county council consolidates its new role in the FRM framework, it is likely that it will acquire a range of new capital resources. These resources will be much needed and valued by local level institutions. For the county council, this will require a more proactive effort to engage with local communities and an investment in the creation of CISC with community level institutions.

Beyond the county level, the situation remains relatively stable and institutions indicate that they are comfortable with the current level of CISC. However, in the Teign Estuary area, much of the regional level flood risk CISC is currently directed through the district council. Effort will have to be made to build CISC with both community level institutions and the county institution. The author anticipates that community level CISC with regional institutions will have to be community driven ( $C > ISC$ ). With the national level institution (the EA), evidence suggests that this will generally be institution driven ( $C < ISC$ ).

## **6.5 Conclusion**

This chapter has shed light onto a specific form of social capital, namely CISC. The discussion focussed on how CISC is manifest at the individual and collective levels, how CISC exists and operates in conjunction to other forms of capital and finally what role a stable institutional framework plays in building CISC.

In the first instance, the analysis was able to discern manifestations of CISC at individual and collective levels from the four communities at the heart of this research (the FRM framework and the three case study communities of Newton

Abbot, Teignmouth and Shaldon). For the FRM framework, the analysis enabled a distinction to be drawn between institutions that form the core of the FRM framework community (C) and other, less engaged, institutions (I). That distinction made the identification of CISC more successful. It was also evident that, in the FRM framework, the high degree of institutionalisation made the measure of CISC easier. Specifically, policy documents produced by institutions were helpful in identifying the crucial links that define CISC in the framework.

From the FRM framework and the policy document analysis, it was possible to identify bi-directional (reciprocated links) and unidirectional links (un-reciprocated links). This led to a distinction between CISC driven by the community in forming links with an institution (C>ISC) and manifestations where the institution is driving forward the links with the FRM community (C<ISC). The analysis suggests that C>ISC is a more passive form of capital, where the institution is only engaged in a reactive manner, only providing resources, information or input when the community requests such engagement. In the C<ISC case, the driver is more complex and may relate to the institution seeking information, trying to increase its influence, certify its credentials or reinforce its reputation. In the C<ISC case, the benefits of investment in CISC can be undermined if links are not reciprocated, or if links are circumvented.

The FRM framework analysis also revealed how institutions with reciprocated CISC links are easily drawn into the core of the community. The case of the ODPM and DCLG revealed that unless links are refreshed, then power, influence, credentials and reputation can be diminished. The ODPM/DCLG example showed how human, physical, economic and even cultural capital can be easily transferred from one institution to another, but CISC is more difficult to transfer. The ODPM/DCLG

example also highlighted an issue that was more comprehensively covered in the analysis of the three case study communities, namely how CISC operated in relation to other capitals.

In the community survey, respondents were asked to rank the different capitals. All respondents identified economic capital as the first choice capital for use in the event of a flood. In areas dominated by residential respondents (Shaldon), human capital was preferred over physical capital for dealing with a flood event. In institutionalised communities (Teignmouth), physical capital was ranked second after economic capital and social capital was more highly ranked than human capital. It is possible that institutionalisation gives groups a stronger understanding of the value of social capital and group members' greater confidence in mobilising physical resources when compared to residential communities, where support networks are largely lacking institutional development.

Interestingly, cultural capital was identified by all groups to be the last choice for use in times of crisis. It was unclear if this was because it was judged to be least effective or if it was most highly prized, but either way, holders of cultural capital were more cautious about depleting their cultural capital reserves. In the analysis of the case study communities, the author suggested that cultural capital may play a more significant role in promoting flood risk community resilience. The author proposed that a role created in the flood risk communities, specific to flood risk and located within an institutionalised entity with a flood risk focus, would gather a considerable level of "flood risk cultural capital".

In Newton Abbot, where CISC was lowest, the creation of flood risk cultural capital would be most difficult. That difficulty arose because there was no local flood risk

institution and no obvious individual with an interest in flood risk issues to act as a candidate to occupy such a role. In Teignmouth and Shaldon, flood risk groups did exist, but the fragmentation of the community lowered the CISC level in Teignmouth and a powerful clique with no apparent interest in flood risk had the potential to undermine efforts to use CISC to improve community resilience. In Shaldon, CISC was high and, as well as having a flood risk group, it had two potential candidates for a flood risk role. In Shaldon, the decision as to who best should acquire the flood risk cultural capital centred on the issue of access to other resources. One candidate in Shaldon was linked to the FRM framework (high external CISC) and the other had strong links within the local community (high internal CISC). It was not clear if the community would prefer a candidate with access to considerable economic, human and physical resources outside the community or one with high social capital within the community.

Perhaps the deciding factor in the Shaldon case would be the ability of the individual with high external CISC to actually deliver on the promise of access to these vast stores of flood risk resources held outside the community. Previous chapters have already shown that the Shaldon community has been successful in acquiring resources from the FRM framework, having approved a plan by the EA to build a new flood wall. However, in that case, Shaldon had not been proactive in seeking the flood wall, rather the EA had to drive the project forward. It appears that flood risk was not a high priority for the Shaldon community, but when the EA approached Shaldon, they were able to rally around the local government body (SPC) and negotiate a mutually acceptable outcome. Evidence in previous chapters explained that the EA had done the same in Teignmouth, but the local community had rejected the plans. The analysis in this chapter helps to explain why it was easier to deal with

the Shaldon community, namely because it had a higher level of CISC than in Teignmouth. In saying that, the author concedes that CISC is not the only reason the EA was successful, but it is a contributing factor.

It was also clear from previous chapters that the Shaldon flood protection scheme involved local government (SPC), district government (TDC) and national level (EA) institutions. What is noticeable within that list is the absence of county and regional level institutions. Whilst it would be good to know about the regional input to the scheme, what this chapter has highlighted is that the most important understanding needed is the county level role. That is important because this chapter has shown that recent changes in the FMR framework are shifting the focus for flood risk management away from the district to the county. At the same time, the local level is expected to build up its capital reserves and take on a greater role in managing local flood risk. Both changes in the structure and operation of the FRM framework are likely to have an impact on future resilience building efforts and this chapter has revealed that as CISC is not easily transferred, institutions benefiting from the changes in the FRM framework will have to be proactive in investing to develop new CISC. To that end, this chapter was able to provide suggestions as to where such an investment may be most effective in the long-term. Those suggestions were made with the aim to maximise the potential for proposals developed by this thesis to enhance community resilience and will be explored further in the next chapter.

## **Chapter 7. Community Resilience**

## 7.1 Introduction

At this point in the thesis, the discussion returns to the subject at the heart of this research, namely community resilience. The aim of this project has been to develop a deeper understanding of community resilience by exploring the relationship between resilience at the community level and social capital derived from community-institution links (CISC). The route taken to address the aim started with a review of published research focussing on the concepts of resilience, community, social institutions and social capital (Chapter 2). From the literature reviewed, a number of issues with significance to this study were extracted and built into a research framework.

Chapters 4, 5 and 6 have discussed findings derived from the application of the research framework. The chapters explored research findings as they related to social institutions involved in flood risk management, local communities at risk from tidal flooding, and finally CISC. This Chapter will evaluate how research for this thesis and the discussions in preceding chapters can be combined to deepen the established understanding of community resilience and explore how CISC may be mobilised to improve community resilience. The discussion in this chapter is divided into three parts.

Building on the discussion in Chapter 2, the first part (Section 7.2) takes ideas about the maturity of resilience in individuals and uses them as a basis for analysing the case study communities (Cairns 2002, Jacelon 1997, Mallak 1998, Seaman *et al.* 2005). The second part (Section 7.3) builds on the community resilience assessment by analysing sub-groups and a number of specific individuals, drawn from the community survey sample, to identify generic and specific traits useful for a

community based FRM role (adapted from Coleman and Hagell 2007 and Doron 2005). The final section, Section 7.4, explores the extent to which FRM institutions have moved beyond traditional hazard management systems and incorporated contemporary ideas about hazard planning that enhances community resilience (as defined by Boshier *et al.* 2007, Homan 2003, Oven *et al.* 2012, Tobin and Whiteford 2003).

## **7.2 The maturity of resilience in the case study communities**

### **7.2.1 Section outline**

In Chapter 2, the author described how individuals and communities continually adapt to the daily challenges they face. That process of adaptation provides the foundation from which individuals and communities build their resilience. However, daily adaptive processes are not a fruitful area in which to seek a deeper understanding of resilience (Woods 2006). For such a study, the focus needs to be on processes that enable systems to cope with events outside of their “normal adaptive capacity” (*ibid*). As such, this research needs to define boundaries of current competence in the case study communities and also understand what dynamics challenge or go beyond the “competency envelope”.

Indicators that help to define the competency envelope at an individual level have been well studied and fit into a three stage maturity model (Jacelon 1997, Mallak 1998, Cairns 2002 and Seaman *et al.* 2005). The three stages of the maturity model are defined as the child stage, the adolescent stage and the adult stage. In this section, data gathered from the case study communities and the FRM institutional framework community will be evaluated against each stage in the maturity model.

The evaluation will aim to reveal areas of strength and weakness in the resilience maturity of each community (competency envelope) and help to guide policies aimed at using CISC to enhance community resilience.

### **7.2.2 Low (child level) community resilience indicators**

To Jacelon (1997), a triad of traits are needed to build resilience in children. Those traits include a positive, active and reflective personality with strong cognitive skills, a caring adult or close family and strong external institutional support for both the child and the family. For Cairns (2002), building resilience in children includes the adaptation to solitude (as a conscious being separate from the world around them) and the development of a compassion for the needs of others.

There are three lessons here for this study of community resilience. First is to find evidence of the cognitive personality traits outlined by Jacelon (1995). Second is to assess the community self-reliance and the need for a strong supporting external body. Third is to evaluate evidence of self-awareness within the flood risk community and empathy with other communities subject to a similar flood risk threat (as described by Cairns 2002).

Looking first at evidence for a positive, active and reflective personality, data presented in Chapters 4, 5 and 6 reveal quite different results between the FRM framework community and the three case study communities. In the FRM framework community, both policy documents and interviews revealed strong evidence that institutions engaged in the management of flood risk were positive minded, active in addressing flood risk issues and reflected upon lessons learned from the history of flood events in the UK (Sections 4.4 and 5.7). In the case study communities, the

questionnaire survey revealed some positive attitudes, but less active engagement in flood issues and very little reflection (Tables 5.1 and 5.4 in Chapter 5).

When analysing the level of support that the community required from external bodies, here again the FRM framework community had a range of levels of engagement. Chapter 6 showed how the FRM framework community possessed a core group of institutions and this group received support from a number of institutional clusters, but the support was largely passive and driven by the core group (C>ISC type of relationship). As such, the FRM framework is judged to require little further external support. In the case study communities, the questionnaire survey revealed few links to external bodies, in relation to flood risk issues (Section 6.3.5). That said, the Shaldon flood defence wall illustrated how external support was required by the community to gain access to economic, human and physical capital in order to address their local flood risk problem (Section 5.3). It is possible that the lack of evidence of external support in Newton Abbot and Teignmouth was due to the lack of any consensus within those communities of a need to address their local flood risk issues (Table 5.1).

In relation to the community being self-aware, the FRM framework policy documents make clear that institutions in the framework are all aware of their role in the management of flood risk. This awareness may fluctuate over time, as changes occur within the framework, and it also seems that most institutions in the framework were unaware of the full extent of the “community”. Only the EA had a complete set of links to all of the core group institutions and, through them, had the ability to understand the full extent of the community (Section 6.2.1). In Newton Abbot, awareness of the flood risk community was not very evident although a history of

flooding in the area was clear (Section 4.2.1). In Teignmouth a local flood risk group had been created, but not all community members were aware or recognised the need for such a group (ibid). In Shaldon, a working party had been created by the local council and had engaged with the EA to develop plans for a new flood defence wall (Section 5.3). The group had subsequently disbanded and had been replaced by a flood warden group (Section 6.2.4).

From this analysis of the four communities studied as part of this thesis, the FRM framework is revealed as fully satisfying the criteria that would mark it out as having achieved the child level threshold of resilience. In Newton Abbot, questions are raised in relation to all three areas of investigation, suggesting that the community may be below the child level threshold of resilience. In Teignmouth, there is some evidence of awareness but other elements were less clearly proven. In Shaldon, there was good evidence of positive attitudes and action, some evidence of self-awareness, but less of empathy and there was strong evidence of the need for external support (Table 7.1 provides a summary of this assessment).

Based on the assessment above and with a view to developing proposals to utilise CISC as means to improve community resilience, a judgement can be made as to the basic criteria needed for a community to satisfy the lowest maturity level of resilience. Specifically a positive, active and reflective competence was exemplified by the two communities where CISC links were strongest and where fragmentation of the community was minimal. Strong internal CISC enables the community to positively utilise individual motivation for action and to effectively engage with reflective patterns of behaviour. With regard to self-reliance and needing external support, the threshold within the case study communities was less clear. Effective

self-reliance may be indicated by strong internal CISC, but as the Shaldon flood risk example showed, external CISC is needed to provide support and additional capital resources to effectively address local flood risk issues. CISC does not necessarily assist the community in developing its self-awareness, but the creation of a flood risk group and a FRM role within the community, as described in Chapter 6, will help to raise awareness of flood issues. Empathy can also be enhanced by creating CISC to groups in other flood affected communities.

**Table 7.1 Map of community resilience assessment using child maturity criteria**

(Source: Author)

Community	Positive, active and reflective	Self-reliant No Need for External Support	Self-awareness and empathy with other communities
<b>FRM Framework</b>	High (Core group, regular policy reviews)	High (Extensive internal support network)	High (Clear roles and outward engagement)
<b>Newton Abbot</b>	Low (No flood group identified)	Unclear (no request for support)	Low (Few concerns about current flood risk)
<b>Teignmouth</b>	Moderate (parts of community but fragmented)	Unclear (refused offer of support)	Moderate (self-aware not necessarily empathy)
<b>Shaldon</b>	High (Evidence of action to address flood risk)	Low (was offered and accepted support)	Moderate (self-aware not necessarily empathy)

### 7.2.3 Moderate (adolescent level) community resilience indicators

Both Coleman & Hagell (2007) and Seaman *et al.* (2005) found that as children move into adolescence, resilience is further developed by exposure to more acute or

multiple risks. In the adolescent stage the individual is allowed to experience adversity and protective factors are cut back, being tailored to address the particular risk environment to which the adolescent is exposed. Adolescent resilience is demonstrated by adequate functioning after exposure to such risks (ibid).

There are three lessons that can be applied to the community resilience analysis that would help to indicate adolescent level resilience building processes evidence of exposure to acute or multi-hazard crisis events, support being less generic and tailored to suit each event and adequate functioning being maintained in the aftermath of an event.

In the FRM framework community, there is good historical evidence that the community has had to deal with some quite large and complex flood events (Figure 5.12). In Newton Abbot, the flood event of 1979 stands out in the community memory as being very acute for the community (Table 5.6). In Teignmouth, respondents recollected multiple events but these seem to be localised within the community and there was a belief by some that the flood risk had receded (ibid). In Shaldon, some elements of the community pointed to localised flooding caused by tidal locking, but recollections were not strong.

When assessing evidence of support tailored to meet the need of a specific event, the FRM framework clusters point to a wide range of links created by the core group to institutions that offer specialist advice (Figures 4.14. and 4.15). In Newton Abbot and Teignmouth, evidence was less clear and it appeared that no offer of support has been made to the community and no help sought by the community. In Teignmouth the community was approached by the EA with an offer of support (in 2004), but the community rejected the offer (Section 5.3). In Shaldon, there was

good evidence that when the EA offered support to the community both the EA and the community congealed to tailor the type of support received so that it met the needs of the community (ibid).

In relation to the final criteria (adequate functioning after a crisis), the FRM framework does reveal an ability to sustain its operations in the aftermath of a flood crisis (Section 4.4). In Newton Abbot, many of the community survey respondents were able to recall actions taken in response to the 1979 flood event. In Teignmouth, due to the localised nature of recent flood events, recollection of collective recovery was less clear. In Shaldon, due to the lack of any significant event, there was little evidence of the recovery experience (Table 7.2 provides a summary of this assessment).

**Table 7.2 Map of community resilience assessment using adolescent maturity criteria**

(Source: Author)

Community	Exposure to acute or multiple events	Self-reliant Support tailored to needs	Evidence of adequate functioning after an event
<b>FRM Framework</b>	High (Evidence of engagement with many events)	High (Internal network tailored to support specialist input)	High (No evident of event large enough to break network)
<b>Newton Abbot</b>	High (Events clear in community memory)	Unclear (no recent request for support)	Moderate (Some recollection of event and recovery)
<b>Teignmouth</b>	Moderate (Events fading from memory)	Unclear (refused recent offer of support)	Unclear (Events too long ago)
<b>Shaldon</b>	Low (No evidence of recent events)	High (clear evidence of tailoring support)	Low (no evidence of recent events)

By way of guiding CISC policy decisions and to identify communities satisfying a threshold of moderate resilience, this evaluation points to the value that direct experience of a flood event has on building community resilience. As flood events cannot be “manufactured” to create such experience, this insight is where CISC links to other flood risk communities with recent flood event experience as it can enable the community to learn directly from such experience (McEwen *et al.* 2012, Wilson 2012). Building on the foundation of strong internal and external CISC, tailoring of the links based on an assessment of local needs is an indication of a maturing resilience. As with direct exposure to flood events, so adequate functioning after an event cannot be manufactured. In this case, mobilising CISC to other flood event communities to enable the community to act in a supporting role and assisting another community to regain its adequate functioning after a flood event, would serve as a reliable proxy indicator.

#### **7.2.4 High (adult level) community resilience indicators**

To Mallak (1998), developing resilience in adults must include exposure to an acute or disintegration phase, which then passes into a reorganisation or reintegration phase. For Mallak, there were several sources of resilience in adults: the ability to create order out of chaos, to work under pressure, to access resources and to balance the fight/flight reaction. In addition, an attitude of wisdom, the ability to mobilise past experience and an attitude of sceptical curiosity were helpful in building resilience. Finally, the existence of a virtual role system can help as a measure to reveal how well the adult understands their own role and that of others within the community. For the community assessment model, the adult criteria may be

summarised as: exposure to a disintegration event, complete self-reliance with an attitude of wisdom and evidence of reorganisation and re-integration.

In relation to the first criteria (disintegration event), there was no evidence that the FRM framework had been exposed to a catastrophe so severe that it caused the disintegration of the community. In Newton Abbot, the suggestion was that for many residents the floods of 1979 were catastrophic. In Teignmouth, there were old historical references to events that would have been as catastrophic as the Newton Abbot flood in 1979, but the events were a distant memory recalled by very few survey respondents. In Shaldon, there was no evidence of a catastrophic event.

In relation to being self-reliant and possessing an attitude of wisdom, the FRM community seemed to rely on very few links outside the community and the policy documents did point to a good attitude of wisdom, learning lessons from past events. In Newton Abbot, despite the significant historic event, there appeared to be little concern about the current (and on-going) risk and little evidence of actions to promote self-reliance in the event of a flood. For the Teignmouth community, awareness of the flood risk was growing and, having previously refused the offer of assistance from the EA, this thesis has revealed how that position changed between 2004 and 2010 (Figures 5.5 and 5.6). In Shaldon, the community showed a great willingness to learn lessons from the EA about the flood risk and behaved with great wisdom when deciding to accept the offer of support.

When considering the experience of re-organisation and reintegration, the FRM framework showed good signs of re-organisation following flood events (Section 6.4), but there was less evidence of any forced reintegration activity following a catastrophe. In Newton Abbot, the reorganisation and reintegration was effective

following the 1979 flood, but evidence from the interviews suggests that the benefits of that experience has diminished (Interview 4). In Teignmouth, there was little evidence of any event where substantive reorganisation was needed and, in Shaldon, there was no evidence (Table 7.3 provides a summary of this assessment)

**Table 7.3 Map of community resilience assessment using adult maturity criteria**

(Source: Author)

Community	Exposure to disintegration event	Self-reliant attitude of wisdom	Evidence of reorganisation and reintegration
<b>FRM Framework</b>	Low (No recent evidence of disintegration event)	High (Good evidence of building on historical events)	Moderate (Evidence of reorganisation after events)
<b>Newton Abbot</b>	High (Events clear in community memory)	Low (Little evidence of concern about current risk)	Moderate (Some recollection of event and recovery)
<b>Teignmouth</b>	Moderate (Events fading from memory)	Moderate (Awareness building of current risk)	Unclear (Events too long ago)
<b>Shaldon</b>	Low (No evidence of recent events)	High (Good awareness of current and future risk)	Low (no evidence of recent events)

To some extent, adult level community resilience is not something to wish on a community. For an entire community to undergo a catastrophic disintegration and reintegration experience will be difficult for most to imagine. Such communities are likely to remain rare and serve as case studies for future research into resilience. More easily accessible are individual catastrophes experienced by community

members. In this respect, strong internal CISC can act as both a means to identify and learn from catastrophic experience in the community, but also as a means of providing support to individuals in the community during and after such an event. The attitude of wisdom indicator is best developed when the community actively mobilises CISC to address a flood risk issue (internal or external to the community), but in addition it must make efforts to reflected on and learn the lessons from such actions.

### **7.2.5 Lessons learned**

In this section, the author has drawn upon a strand of resilience research that focussed heavily on resilience at the individual level. Using a model based on a resilience maturity framework, this thesis has evaluated the four communities studied as part of this thesis. The evaluation revealed that communities did not follow a linear pattern of maturity, and gaps in the resilience assessment could arise where documentation was lacking, experience was lacking or when memories of historic events faded. As such, the highly institutionalised FRM framework community provided the most comprehensive data set and performed best overall. In the final assessment, the FRM institutional community could be described as having a moderate to high level of resilience.

Where scope for enhancement of the FRM community's resilience existed, it was at the highest levels of assessment (adult resilience). However, caution was expressed about promoting the idea of the need for the community to undergo some form of disintegration and reintegration experience. Instead, the author suggests that the FRM institutional community may gain equal benefit by learning from the experience of others. Building CISC links (internal and external) to individuals and communities

who have had the misfortune to experience and recover from catastrophic events is a way of building the highest level of community resilience. But, those CISC links must not be passive C>ISC type links. They must be active and engage the community in a supporting role to assist victims of such catastrophes.

Strong internal and external CISC is a good basis for high level resilience, but where the links are not mobilised and remain passive, resilience may only achieve at low to moderate status. Where CISC is mobilised, and to achieve moderate resilience, experience of acute events and adequate function after such event is important, but, in addition, evidence is needed of efforts to proactively assess the local need and tailor support systems to cope with each event. Only then may the community be judged to be moderately resilient. An absence of CISC to address a local flood risk and the fragmentation of the CISC links within a community limit the potential for the development of community resilience and prevent a community from progressing beyond the lowest assessed level of resilience.

The author judged the maturity assessment model to be effective in providing some measure of community resilience. Within the system, it was possible to discern how CISC could be used to help enhance community resilience. The findings reinforce recommendations made in Chapter 6, namely for the creation of a group with a flood risk focus in every flood risk community and a role within such a group to address community FRM issues. Only with such a structure could the recommendations made in this section be effectively realised. This section has gone further than Chapter 6, by providing some basis for setting out the terms of reference for the FRM group and role.

The FRM group would act as the body to which CISC links, both internally and external to the community, are made. The FRM role incumbent would work to collate and assess local flood risk knowledge and experience, as well as engage the community in action to address local flood risk issues. That action should aim to reflect on historic events and address future events. The role incumbent would also work to coordinate external CISC links with other flood risk communities and to seek out communities in need of assistance, where efforts to support external communities can be directed. In the next section, evidence collected from the community survey will be analysed to identify any individuals with characteristics to suit such a role.

## **7.3 Resilience building traits for a community based FRM role**

### **7.3.1 Introduction**

In the last section, the author recommended the appointment of an individual to a FRM role within the community. The role incumbent would have a significant part to play in improving the resilience of the overall community to local flood risk. Chapter 6 highlighted the challenge inherent in such an appointment based on an assessment of social capital possessed by the role incumbent. In this section, further analysis is undertaken using resilience criteria.

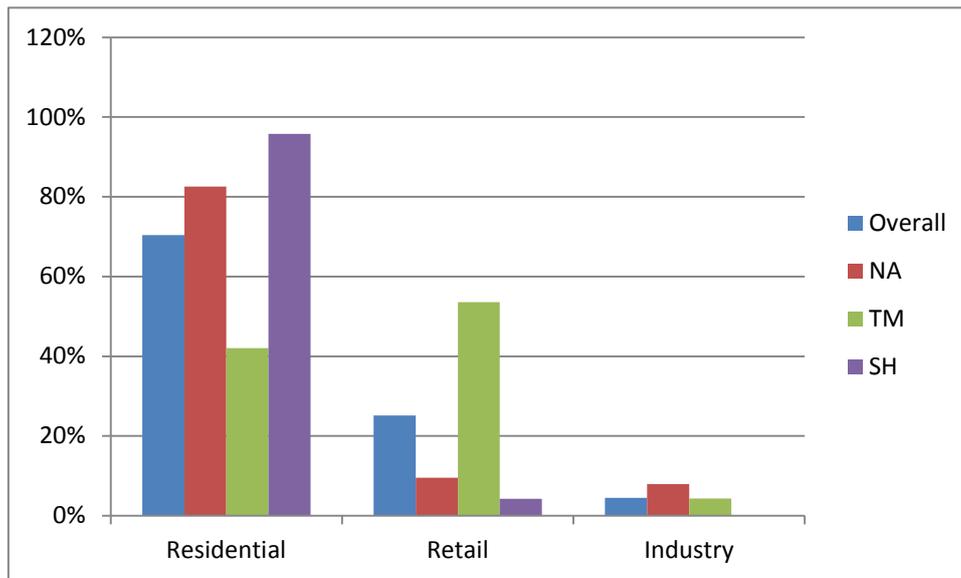
In Chapter 3, a summary of the questions included in the community survey was provided. As part of that summary, some detail was given of the respondent demographics. Thirteen sub-groups within the survey sample were identified and in this section the responses of the sub-groups to questions about resilience will be analysed. The aim of the analysis is to reveal a generic profile for the FRM role

incumbent that incorporates the best resilience building traits from across the survey sample.

Questions about resilience in the community survey were designed to acquire data of direct personal resilience building experience, perceptions and behaviours. In addition, the questionnaire enquired about the individual's knowledge of resilience building experience and perceptions and behaviours within the wider community. As well as analysing both sets of resilience questions, this section augments those answers with an analysis of potential role incumbent's responses to questions about social and other forms of capital. The latter part of the analysis will serve to correlate the individual's resilience-building potential with traits that would be effective in engendering and mobilising CISC within the community.

### **7.3.2 Identifying sub-groups within the resilience survey sample**

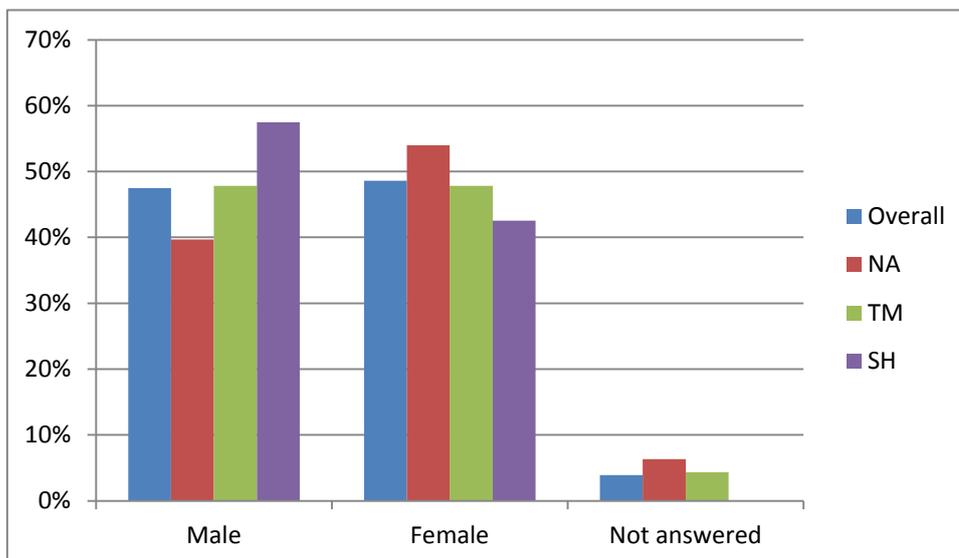
Within the subset of 179 completed questionnaires, there were three classifications of respondent: resident (70%), retail organisation (26%) and industrial organisation (4%). Figure 7.1 illustrates that the Newton Abbot and Shaldon distribution was similar, but Teignmouth included a significant proportion of retail organisations. Industrial organisations were a small minority in all three study sites. For analysis, the resident survey can be compared across all study sites, but organisational views will only be representative of Teignmouth.



**Figure 7.1 Distribution of questionnaire sample classifications**

(Source: Author)

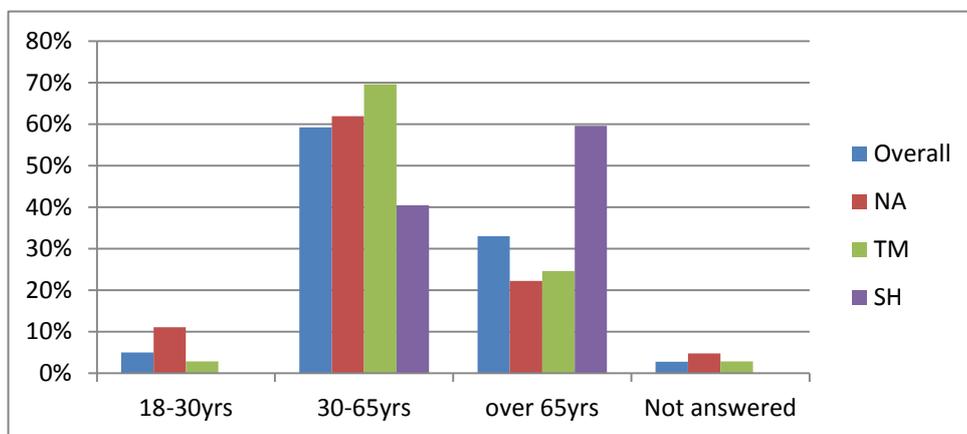
In terms of gender distribution, the survey was able to achieve a reasonably equal split between male and female respondents in all survey sites (Figure 7.2). This will enable analysis to determine if gender plays a role in community resilience.



**Figure 7.2 Gender Distribution in questionnaire sample**

(Source: Author)

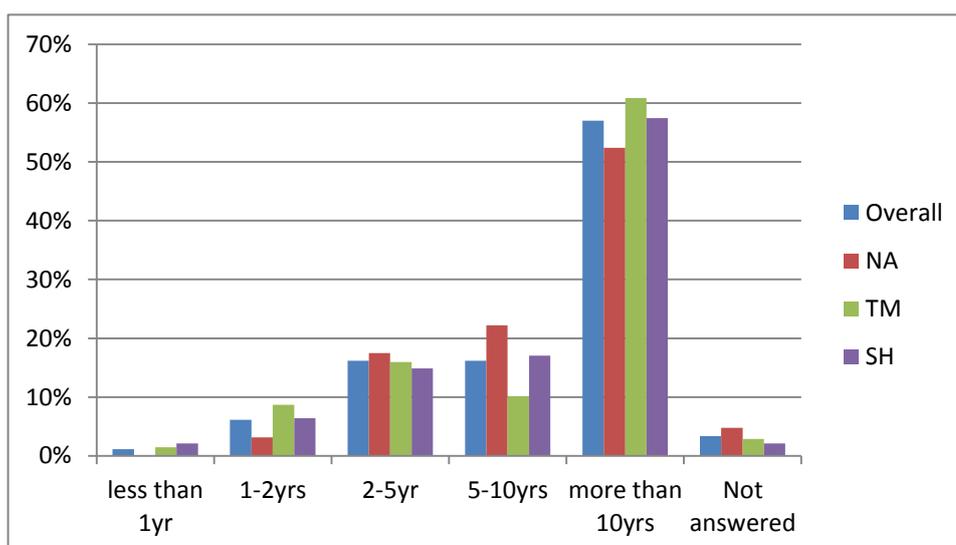
Respondents were asked to indicate their age banding and the completed questionnaires revealed that the significant majority of respondents were over 30years of age. The age band 30-65years was well represented in all study sites, but Shaldon was noticeable in have a much higher percentage of respondents over 65years of age (Figure 7.3). However, the smaller overall size of the Shaldon sample means that it should be possible to achieve a reasonable comparison with respondents in the same age band from the other study sites.



**Figure 7.3 Age profile of questionnaire respondents**

(Source: Author)

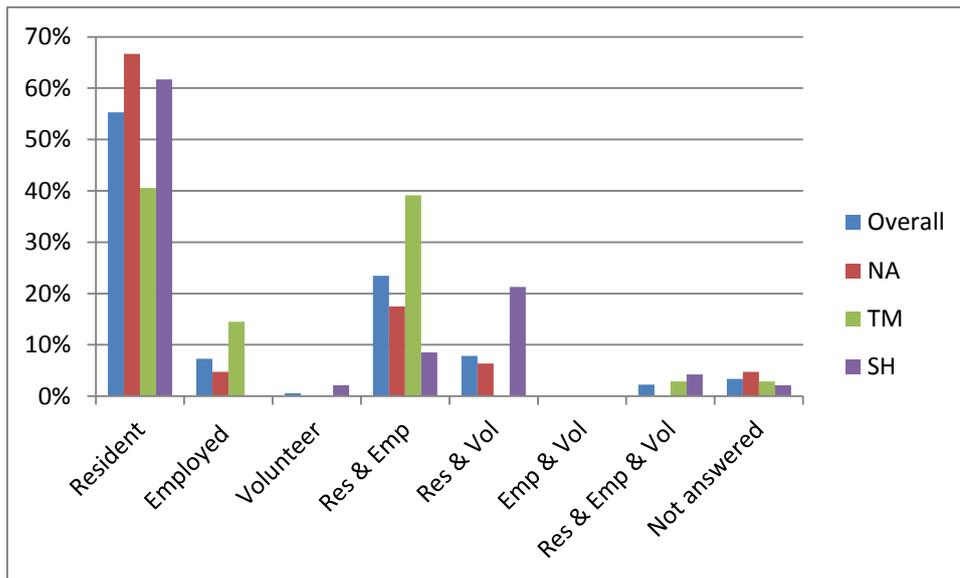
All three study sites revealed a similar pattern of results when asked how long respondents had lived or worked in the local community (Figure 7.4). In all cases, the majority of respondents had engaged with the local community for more than 10years. This may enable some distinction to be made between those with less than ten years' experience of the community, say 1 to 10 years and those with more than ten years' experience.



**Figure 7.4 Distribution of questionnaire respondents based on years in community**

(Source: Author)

In terms how the respondent population were engaged in the local community, the study sites revealed some degree of variation. In both Newton Abbot and Shaldon, 60% were resident and 30% were resident and working in the community. For Teignmouth, the balance was more equal with approximately 40% in each community. Overall, 31% of those resident and working in the community were engaged in voluntary work, but there was significant variation between the study sites. In Shaldon, 76% of those living and working in the community were doing so on a volunteer basis, whereas in Teignmouth the proportion was only 7%, with Newton Abbot being 31%. This result highlights an opportunity to distinguish between replies from those simply resident in the community and those who are resident with paid employment and those engaged in volunteer work within the community (Figure 7.5).



**Figure 7.5 Classification of community engagement by questionnaire respondents**

(Source: Author)

The demographics of the sample allow a number of interesting comparisons to be made:

- Compare overall community responses from the three study sites of Newton Abbot (63 No), Teignmouth (69 No) and Shaldon (47 No)
- Compare residents responses (126 No) to organisational respondents (53 No – bias towards Teignmouth with 75% of sample)
- Compare male (85 No) to female responses (87 No)
- Compare responses from those under 65years of age (115 No) to those over 65years of age (59 No)
- Compare responses from those with less than 10years experience in the community (71 No) to those with more than 10years experience in the community (102 No)

- Compare residents employed in the community (42 No – bias towards Teignmouth with 64% of sample\*) to residents undertaking voluntary work in the community (18 No – bias towards Shaldon with 67% of sample)

### **7.3.3 Creating the generic profile for a community based FRM role incumbent**

Previous research, such as by Doron (2005) and Coleman and Hagell (2007), has found that an adaptive capacity helped to create resilience by engendering a sense of belonging, control over situations, an optimistic perspective and a sense of proportion to change. The questionnaire respondents were asked if they had direct experience of crisis events such as a flood, either as a victim or in a victim support capacity. Respondents were also asked if they had spent time reflecting on lessons learned from experiences of crisis events, such as floods, and if they had ever changed their behaviour as a result of such experience (Mallak 1998).

Answers to resilience building trait questions were coded numerically:

1. Yes
2. No
3. Do not know
99. No response

From these responses, only the positive “yes” answers scored against a measure of resilience, giving a potential maximum score of 4. Each positive response also elicited a qualitative question requesting some elaboration, from which a further score was calculated adding to the resilience score. Qualitative answers were evaluated on the basis of:

- Has the respondent described a specific event(s)?
- Does the description include a date reference(s)?
- Has the event(s) been located relative to the study site?

A further 4 points were available from the qualitative questions, giving a total score of 8 as a measure of personal resilience based on evidential answers. Table 7.4 illustrates the overall scores for the whole survey.

**Table 7.4 Overall results for individual resilience questions**

(Source: Author)

Score	Positive responses	Qualitative evidence	Combined score
0	117	121	117
1	28	26	4
2	22	22	24
3	7	5	2
4	5	5	20
5			2
6			5
7			0
8			5

In Figure 5.6, resilience scores from the sub groupings have been plotted as a cumulative percentage of the overall sample. Using the overall sample profile as a reference, plots above the reference line represent lower overall resilience and those below represent stronger resilience. Using Figure 5.6, it is possible to discern two generic profiles for the role of FRM coordinator in a flood risk community: one is for a person likely to show above average resilience building traits and one with below average resilience building traits.

Generic profile of a community member likely to possess above average resilience building traits:

*Male, over 65 years of age, resident in the community and lived in the community for more than 10 years, engaged in voluntary work in the community.*

Generic profile of a community member likely to possess below average resilience building traits:

*Female, under 65years of age, working in the community and/or having lived in the community for less than 10years.*

Overall, the Teignmouth community had the least resilient individuals, Shaldon was close to average and Newton Abbot had the most resilient individuals. The Teignmouth result is not very surprising, as it was the community with the highest number of organisational respondents. The organisational respondents were most likely to fit the profile of the lower than average resilience individual. The fact that Newton Abbot is revealed as having more resilience than Shaldon is surprising. It is possible that the lack of any significant historic flood event in Shaldon has lowered their overall score. In Newton Abbot, the legacy of resilient individuals created by the 1979 flood event has endured, despite the fact that since 1979 event there have been no new floods. It is also possible that the Newton Abbot population is more stable and the memory of the local flood history has been retained, but kept dormant. In Shaldon, there is a high percentage of holiday homes and retired folk, so population turnover is higher than Newton Abbot. Hence, in Shaldon, the flood risk is a fresh concept for residents and they have been active in addressing the threat, which has boosted their resilience.

# Individual Resilience Scores

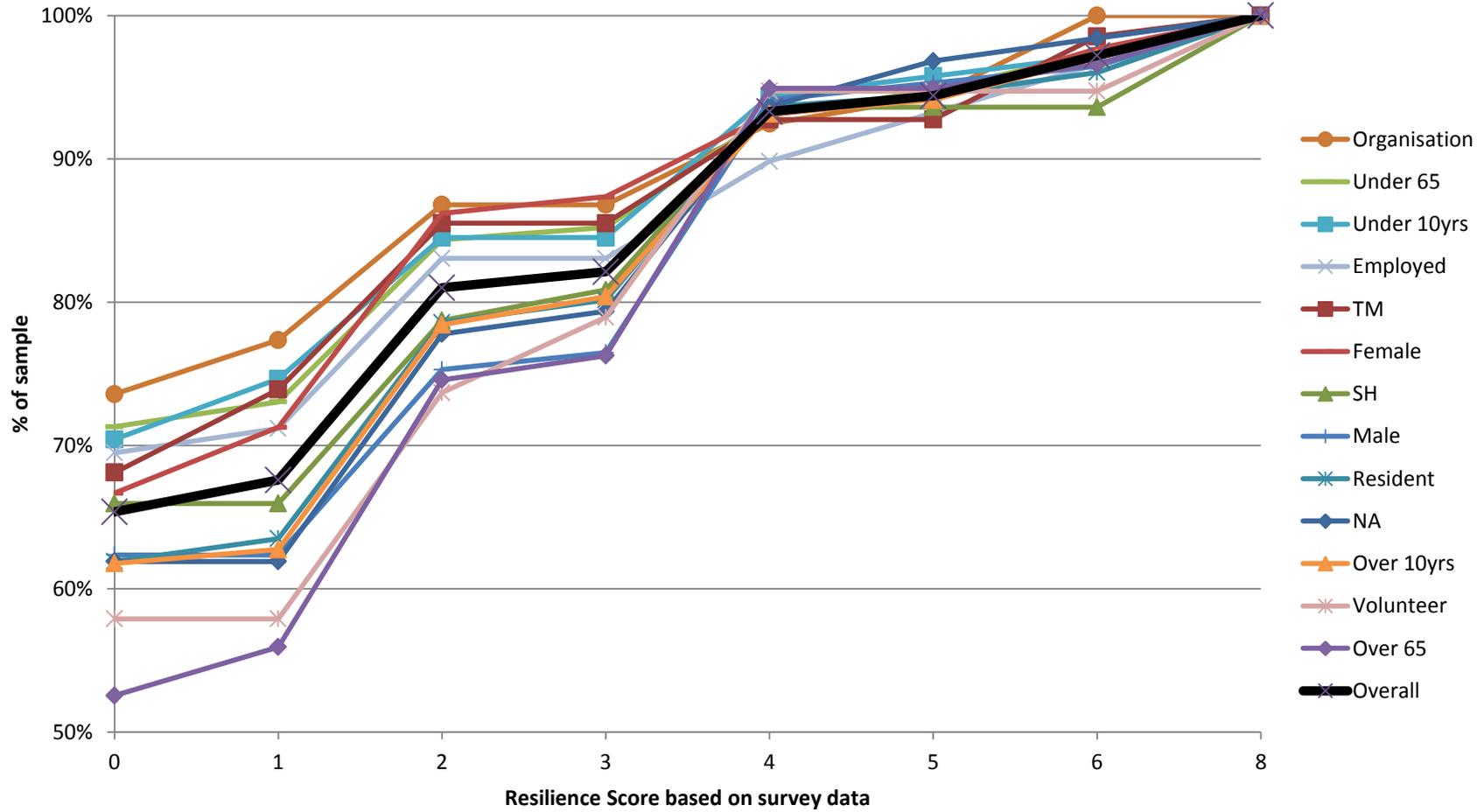


Figure 7.6 Cumulative plot resilience scores (Source: Author)

### **7.3.4 Traits of potential FRM role incumbents**

In Chapter 6, the author identified eight individuals from the three case study communities as potential candidates for the community based FRM roles.

Newton Abbot had two potential candidates, each with links to the FRM institutional community. Teignmouth had four candidates: two with links to the established Back Beach Group and two with links to the FRM institutional community. Shaldon had two candidates: both had a link to the Flood Warden scheme and one had links to the FRM institutional community. In this section, the responses that these individuals provided to the community survey will be analysed to reveal facets about: their resilience building experience, perceptions and behaviours; their knowledge of resilience building experience, perceptions and behaviours within the wider community; and their responses to questions about social and other forms of capital. That analysis will enable a judgement to be made as to the suitability of the candidates for the FRM role.

#### **Newton Abbot Case Study Community**

**Newton Abbot, Candidate A (ref 27)** – Respondent was based in an industrial land parcel (No. 20) and completed an organisation survey questionnaire. The respondent was male, aged less than 65years, was a resident and has lived in the community for more than 10years. By comparing the candidate's profile to the generic profile outlined in section 7.3.3, for a community member likely to possess above average resilience building traits, the author judged that this candidate's profile match was: MODERATE

- **Personal resilience building experience, perception and behaviour -** He had experience of crisis events through knowledge and training received by being part of the fire service. He was very optimistic about this capacity to cope in a crisis. Assessment: HIGH

- **Knowledge of community level resilience building experience, perception and behaviour** - He was aware that the community had been flooded but could not recollect when. He believed that local businesses had been flooded within the past five years and businesses had assisted with clean-up operations, by providing sandbags to victims. He was moderately confident that the community would be able to cope with a future flood event. Assessment: LOW-MODERATE
- **Response to questions about social and other forms of capital** – Social capital data revealed him to be isolated from the main part of the community, but having very good links to FRM institutions. He was aware of some other forms of capital possessed by businesses that may help in a flood event. Assessment: LOW-MODERATE

**Newton Abbot, Candidate B (ref 37)** – Respondent was based in a residential land parcel (No. 6) and completed a resident survey questionnaire. The respondent was male, aged more than 65years, was a resident and has lived in the community for more than 10years. By comparing the candidate’s profile to the generic profile outlined in section 7.3.3, for a community member likely to possess above average resilience building traits, the author judged that this candidate’s profile match was: HIGH

- **Personal resilience building experience, perception and behaviour** – He had direct experience of the Newton Abbot flood in 1979, but was not very confident about his ability to cope with a future flood event. Assessment: MODERATE
- **Knowledge of community level resilience building experience, perception and behaviour** -. He was familiar with the local community flood history and the efforts of the community to help victims of flood events as well as mitigation measure taken to combat future flooding. He was very confident of the community’s capacity to cope with a future flood. Assessment: HIGH
- **Response to questions about social and other forms of capital** – Social capital data revealed him as having good links to friend and family networks, as well as a link into the FRM framework. He relied on insurance as the main other form of capital to help cope with a flood event. Assessment: HIGH

For Newton Abbot, the resilience trait analysis when augmented with the social capital analysis provides a clear indication that candidate B is the preferred

choice for the role of FRM coordinator in the local community. Both candidates possess good personal resilience traits, but candidate B has better understanding of the local community and is better connected to local groups (Internal CISC) than candidate A.

### **Teignmouth Case Study Community**

**Teignmouth, Candidate A (ref 153)** – Respondent was based in a residential land parcel (No. 32) and completed a resident survey questionnaire. The respondent was female, aged less than 65years, was a resident and has lived in the community for less than 10years. By comparing the candidate's profile to the generic profile outlined in section 7.3.3, for a community member likely to possess above average resilience building traits, the author judged that this candidate's profile match was: LOW-MODERATE

- **Personal resilience building experience, perception and behaviour** – She did not provide any evidence of experience or thinking in relation to a local flood hazard and was quite pessimistic about her capacity to cope with such an event. Assessment: LOW
- **Knowledge of community level resilience building experience, perception and behaviour** -. She provided no evidence of being aware of past flood events affecting the local community, but was optimistic about the ability of the community capacity to cope with a future flood event. Assessment: LOW
- **Response to questions about social and other forms of capital** – Social capital analysis reveals that she is very well connected to local groups and has a link to the local Back Beach Group. However, she provided no evidence of other forms of capital to assist in the event of a flood. Assessment: MODERATE-HIGH

**Teignmouth, Candidate B (ref 189)** – Respondent was based in a retail land parcel (No. 37) and completed an organisation survey questionnaire. The respondent was male, aged less than 65years, was a resident with paid employment in the local area and has lived in the community for less than

10years. By comparing the candidate's profile to the generic profile outlined in section 7.3.3, for a community member likely to possess above average resilience building traits, the author judged that this candidate's profile match was: LOW-MODERATE

- **Personal resilience building experience, perception and behaviour –** He had direct experience of a flood event while resident in another community and helped neighbours clean up after the event. He was moderately confident about this ability to cope with another flood. Assessment: MODERATE-HIGH
- **Knowledge of community level resilience building experience, perception and behaviour -.** HE was aware of a history of flooding but did not know the details and he had heard of the EA scheme to build new flood defences. He was less confident about the local community capacity to cope with another flood event. Assessment: LOW
- **Response to questions about social and other forms of capital –** Social capital analysis reveals that he is well connected with local groups and has a link to the Back Beach Group. He also had a range of economic capitals to assist in the event of a flood. Assessment: MODERATE-HIGH

**Teignmouth, Candidate C (ref 169)** – Respondent was based in an industrial land parcel (No. 38) and completed an organisation survey questionnaire. The respondent was male, aged less than 65years, was a resident and has lived in the community for more than 10years. By comparing the candidate's profile to the generic profile outlined in section 7.3.3, for a community member likely to possess above average resilience building traits, the author judged that this candidate's profile match was: MODERATE

- **Personal resilience building experience, perception and behaviour –** He did not provide any evidence of experience or thinking in relation to a local flood hazard and was quite pessimistic about his capacity to cope with such an event. Assessment: LOW
- **Knowledge of community level resilience building experience, perception and behaviour -.** He was aware that the town had flooded but knew no details of past flood events. He was unclear about the ability of the community capacity to cope with a future flood event. Assessment: LOW

- **Response to questions about social and other forms of capital –** Social capital analysis did not reveal any strong links to the local community, but he did have good links to the FRM framework institutions. He demonstrated some awareness of capital assets possessed by the local council that could help the community in a flood. Assessment: MODERATE

**Teignmouth, Candidate D (ref 107)** – Respondent was based in a retail land parcel (No. 5) and completed an organisation survey questionnaire. The respondent was male, aged less than 65years, was a resident with paid employment in the local area and has lived in the community for more than 10years. By comparing the candidate’s profile to the generic profile outlined in section 7.3.3, for a community member likely to possess above average resilience building traits, the author judged that this candidate’s profile match was: MODERATE

- **Personal resilience building experience, perception and behaviour –** He did have experience of a flood caused by a burst water pipe and was moderately confident in his ability to cope with a future flood event. Assessment: MODERATE
- **Knowledge of community level resilience building experience, perception and behaviour -.** He was not aware of the local community flood history and was not confident in the capacity of the community to cope with a flood. Assessment: LOW
- **Response to questions about social and other forms of capital –** Social capital analysis did not reveal any strong links to the local community but he did have a link to a non-core FRM institution. He did not reveal much data about other capitals he had to assist in the event of a flood. Assessment: LOW

Teignmouth was fortunate to have numerous candidates for the FRM role, but none of the candidates was revealed as a good candidate. No candidate scored high in any of the categories. The best of the four candidates was candidate B, who has direct experience of a flood event but not very good knowledge of the

community. The two candidates with high internal CISC scored better overall than the two candidates with high external CISC.

### **Shaldon Case Study Community**

**Shaldon, Candidate A (ref 270)** – Respondent was based in a residential land parcel (No. 34) and completed a resident survey questionnaire. The respondent was female, aged less than 65years, was a resident and has lived in the community for more than 10years. By comparing the candidate's profile to the generic profile outlined in section 7.3.3, for a community member likely to possess above average resilience building traits, the author judged that this candidate's profile match was: MODERATE

- **Personal resilience building experience, perception and behaviour** – She did not reveal any direct flood experience and was ambiguous about her ability to cope in a flood event. Assessment: LOW
- **Knowledge of community level resilience building experience, perception and behaviour** -. She was aware of localised flooding to a few businesses and was aware of community efforts to assist in clean-up operations. She was confident in the ability of the community and local businesses to cope in the event of a flood. Assessment: MODERATE-HIGH
- **Response to questions about social and other forms of capital** – Social capital analysis revealed that she had no strong links within the community but did have a connection to the EA and the Flood Warden group. Assessment: MODERATE

**Shaldon, Candidate B (ref 211)** – Respondent was based in a residential land parcel (No. 6) and completed a resident survey questionnaire. The respondent was male, aged more than 65years, was a resident and has lived in the community for less than 10years. By comparing the candidate's profile to the generic profile outlined in section 7.3.3, for a community member likely to possess above average resilience building traits, the author judged that this candidate's profile match was: MODERATE-HIGH

- **Personal resilience building experience, perception and behaviour –** He had no direct experience of a flood, but having been made aware of the local risk, he joined the local flood group and became familiar with the local flood response plan. He was moderately confident in his capacity to cope with a future flood event. Assessment: MODERATE-HIGH
- **Knowledge of community level resilience building experience, perception and behaviour –** He was not aware of the flood history in the local community, but was aware of the actions of the local flood group's actions in pushing for new flood defences. He was very confident of the community capacity to cope with a future flood. Assessment: HIGH
- **Response to questions about social and other forms of capital –** Social capital analysis showed that he had good links to groups in the community and a link to the Flood Warden group, but no connections to FRM institutions. He had a good awareness of personal and community level capitals that would be helpful in the event of a flood. Assessment: MODERATE-HIGH

In Shaldon candidate B is revealed as the preferred candidate for the local FRM role. Although candidate A has lived in the community for longer than candidate B, since moving into the community candidate B has taken action to learn about the local flood risk and been more active when working with local groups to address the threat of flooding in the community.

### **7.3.5 Lessons learned**

In this section, results from the community survey were analysed in detail to help reveal profiles of candidates that may be deemed suitable to take up a FRM role in a community. Initially answers to questions were assessed to reveal a pattern of scores to represent levels of personal resilience on a scale of 0-8.

The author was surprised to find that more than 65% of the sample population scored 0 or 1 (very low resilience). This percentage was relatively consistent across all three case study communities, but was lower amongst those over 65years of age and higher in organisational respondents. A moderate tier of

resilient individuals was revealed by those scoring 2-3. Across all communities, these individuals accounted for 10-20% of the community. The most resilient individuals scored 4 or higher and they never accounted for more than 10% of the community.

From the generic resilience data, two profiles of a slightly more resilient person and a slightly less resilient person were extracted. These two profiles were compared against the eight individuals who had been identified in Chapter 6, as potential candidates for a local FRM role based on their CISC. The generic profile was compared with detailed personal data submitted individually by each candidate and generally the generic profile assessment compared well to the overall combined assessment.

The detailed assessment of resilience building traits provided a much better basis for making a judgement about the suitability of each candidate. Indeed, for the Teignmouth sample, the judgement was that none of the candidates appeared suitable, based on the detailed analysis. Generally candidates with higher internal CISC were judged to be more suitable than candidates with high external CISC. In addition, personal experience of flood risk and flood risk issues was not necessarily coming from within the community.

Overall, in the generic assessment, the Newton Abbot community was judged to have the best resilience responses from the questionnaire survey, and the analysis of the FRM candidates revealed Candidate B from Newton Abbot as the best overall candidate from the three case study communities. This result is interesting, because within this research Newton Abbot has not presented itself as very active in dealing with flood risk in their local community. This is an

example where CISC is helpful in revealing how resilience can be shown to be high at an individual level but low at the community level.

## **7.4 Moves beyond traditional hazard management to address flood risk in the Teign Estuary**

### **7.4.1 Section outline**

Previous sections of this chapter have considered resilience from the community and individual perspective. In this section, the author will look more closely at the contribution of institutions to community resilience, especially those institutions responsible for the management of flood risk. Chapter 2 made clear that “this thesis is particularly interested in resilience derived from the interaction between organisations responsible for the management of flood risk and communities at risk from flooding” (Sub-section 2.1.5). In relation to that interaction, this section will assess the extent to which the flood risk management institutions have moved beyond traditional approaches to hazard management to incorporate recommendations made by previous research. Specifically, this section will analyse evidence of movement to include elements of vulnerability assessments, pre- and post- event planning, the inclusion of multiple viewpoints in planning decisions and the engagement of both the public and private sector in resilience building efforts (Bosher *et al.* 2007, Demeritt and Norbert 2011, Homan 2003, McKewen *et al.* 2012, Oven *et al.* 2012, Pappenberger *et al.* 2013, Porter and Demeritt 2012 and Tobin & Whiteford 2002). Within the analysis, the author will seek out areas of opportunity, where CISC may be used to enhance community resilience.

## 7.4.2 Moves beyond traditional planning for FRM

Chapters 4, 5 and 6 have already revealed that, as part of the FRM planning process, all three Teign Estuary case study communities had CISC links to the FRM framework. Those links spanned local, district, county, regional and national levels. At the local level, the planning tradition is for parish and town councils to play an important CISC “bridging” role between the flood risk community and the FRM framework. Within the Teign Estuary area specifically, the district council occupied an unusual “non-traditional” role, derived from its unusually strong FRM CISC and long historical involvement with flood risk management in the area:

*“District is the bridge between the community and the county..... We [District Council] also liaise with DCC flood risk management team set up after the Pitt Report. ..Also liaise a lot with the EA.... You need to have strong relations with the EA and the district has always done that. This is unusual as most counties run combined planning but Devon is still very much County-District so the district here has strong links”. (Interview 1)*

It was clear from the analysis of FRM policy documents, as well as from the institutional interviews, that the county council’s CISC is increasing, as it takes on new flood risk management responsibility:

*“As it happens, the guy who was responsible for FRM at district is now at county... Following the Pitt report FRM responsibility was transferred to top tier county authorities. district had been doing it for years and now county has to re-invent it.” ( Interview 1)*

*“We [County Council] are about to take on new duties - the EA is handing over responsibility for consents related to developments affecting “ordinary” water courses – it comes into effect in April 2012.... We are assisting with the development of the Local Flood Risk Management Strategy (LFRMS) for the council... We contribute to FLOWNET, an online forum, where organisations responsible for flood risk management can discuss issues.... I am developing a MoU between Devon county and the EA, detailing what will happen in a flood event” (Interview 4)*

Traditionally, regional level CISC played an important part in coordinating the flow of information between national level and the sub-regional levels. However, opinion was divided as to how effective that role was and changes within the CISC links at the regional level were not necessarily viewed as having a negative impact on resilience building efforts:

*“The regional level of emergency planning has recently been abolished. LRF are formed around the 40 national police authorities and the regional government for the south west had a regional resilience forum which included 4 or 5 LRFs. Now there is the Resilience and Emergency Division (RED) – there are 3 and one for the whole of the south and west, based in Bristol.... The LRF flood group meets 1 per quarter and we talk every time there is a bit of bad weather. Since the plans have been prepared, we meet less often, but it has taken years to reach this stage.” (Interview 1)*

*“As the regional government was abolished, we now have REDs and we are getting good service from them. The RCCC never really worked anyway. We do not have many regional level issues, but the new system will be tested when we do have an incident when one area needs help from another in the region. We are rebuilding the regional system in a different way. Planning for the Olympics is a good example of the new system. Historically we have some strong regional working systems because of our geographic location in the south west. (Interview 5)*

At the national level, the EA has emerged in the last decade as the institution with the most comprehensive FRM CISC, providing access to a wide range of essential FRM capital resources. Those capital resources were less evident at lower levels in the FRM framework, but were much needed to address flood risk issues in local communities. The first quote presented above effectively summed up the opinion of all interviewees:

*“... You need to have strong relations with the EA...” (Interview 1)*

Within this structure, policy documents provided clear evidence of FRM institutions recognising the need for risk and vulnerability reduction actions in the planning process (Bosher *et al.* 2007, Demeritt and Norbert 2011, Porter

and Demeritt 2012). However, that consideration only really appeared to be applied at district level and higher. At the local level, evidence from the interviews suggested that “community” level planning was not well developed and issues to with identifying and protecting vulnerable populations in the local community were at best, weak:

*“Developing an emergency plan in on our [Parish Council] agenda – not yet but in the future.... TDC have been very good and they are encouraging us to set create an emergency plan. Up until now we did not have the energy to do it..... We do not really know who the vulnerable people are and we are not very clear on evacuation plans.” (Interview 2)*

*“I was involved in Emergency Planning in my previous role and we did have a bomb alert in Giraffe – if I had stayed here [Town Council] longer my goal was to have something similar as there is no reason why the private business sector should not have a plan, not just for flood but for any emergency, and there isn’t anything in this town at the moment. That is something I wanted to facilitate with the police.” (Interview 3)*

Policy documents also revealed evidence that planning had been applied to a broad time horizon, spanning pre-disaster planning to post-disaster recovery (Demeritt and Norbert 2011, McEwen *et al.* 2012, Tobin and Whiteford 2002). Here again, as with risk and vulnerability planning, the evidence was that from district level and higher a broad time horizon was deemed to be included in the planning system. At local level, planning of this nature was in its early stages of development and the problem for local level institutions seems to focus on a lack of resources and a lack of commitment from important local stakeholder groups:

*“I supported the idea that we should come up with a parish plan for housing etc. but I could not get sufficient community support. If we had a plan it is more likely that we could get money, but only if the community supports it. We recently lost a library and we are likely to lose the ferry boat workshop and I would like the community to take them on. Either we can respond to issues as they come along, but it is too late as we will not*

*have the community with us, or we can be proactive in anticipating problems and plan for them. We could raise our “prefect” to cover these costs, but it may split the community. There is no pressure from the community to raise additional money.” (Interview 2)*

*“No but the issue of snow wardens is similar. I have written to all businesses in the town, it has been on the radio and in the papers, wherever the local authority could get it and I have also given them a hard copy on information relating to snow wardens, but I have not had a single response. I have done what I can, but the way I get the best response is to eye-ball them. Last year it was a nightmare, and I say to businesses, here is a way where we can all work together to prevent it happening again, but it just needs a few volunteers – just disappointing that nobody has volunteered. Part of the problem was that I had to prepare the bid at the same time and I had to split my time and I diluted both roles, but I did my best.” (Interview 3)*

*“I have developed a bid for a business improvement district, as a way of maintaining town management but funded entirely by the business community. It was not successful because ASDA voted no. Now the Councils are exploring options, and they recognise that they need some form of town management, but it would be a different role. The problem has been to convince businesses, that are being quite successful that they need the town management – if it ain’t broke don’t fix it, but they didn’t understand that if we didn’t have town management we would go backwards. We are ahead of the game at the moment, if we don’t have one of these we will fall back. It is very difficult to get people to understand that.” (Interview 3)*

For this research, evidence of policies that paid due consideration to both internal and external processes was also sought (Oven *et al.* 2012). Specifically, evidence was sought of FRM institutions recognising the need to maintain their services during a crisis event (Demeritt and Norbert 2011). Again, the policy documents did reveal some understanding of this requirement, but none of the interviewees made particular reference to this aspect of planning. At local level, the expectation seemed to be that institutions at higher levels would provide the necessary assistance in times of crisis:

*“County deals with highways and adult community services. In emergency planning the district is seen as the one to sort things out. Town and*

*parishes are very variable, some are very well organised and some are not.” (Interview 1)*

In summary then, the evidence suggests that the FRM institutions have been successful in moving beyond the traditional disaster management system, but that movement has not yet manifested itself at the community level. The system has not fully engaged local level institutions. That being said, there is evidence that CISC between the District and local communities is addressing this shortcoming. However, evidence in Chapter 6 also showed how the district role was being downgraded and this could have an impact on the sustainability of ongoing efforts to engage local institutions in the flood risk management system. To address the longer-term continuity of local level resilience building efforts, new CISC will be needed linking the county council with flood risk communities. The county council will have to recognise this role, proactively develop a policy to engage effectively with local communities and adequately resource that policy to ensure it is fully implemented. There was no evidence of such planning to-date in the data collected for this research.

#### **7.4.3 FRM elites and multiple viewpoints in FRM policy implementation**

This thesis sought to determine if the FRM system has deliberately invested in extensive CISC, by embracing a collective approach to policy development, or if the system was dominated by an expert elite clustered in just a few institutions (as suggested by Homan 2003). Evidence gathered revealed that, at the national level, the FRM framework community has embraced multiple viewpoints, with an extensive network of CISC links to a wide range of specialist groups (outlined in detail in Chapter 4). To some extent, the multiple-

stakeholder approach was also illustrated at community level, by the Shaldon flood wall project. In Shaldon, the EA actively invested in the creation of CISC with the Shaldon community and that investment helped them to collectively decide on the most appropriate “policy” for flood protection in the community (outlined in detail in Chapter 5).

With respect to the Shaldon flood wall example, the author expressed some scepticism about the extent to which the approach was truly engaging the community in the policy process. The author’s assessment was that the EA had already formulated a policy and it seemed that community engagement was only conducted at the latter, implementation stage, of the policy. This may be overly critical, as evidence from Teignmouth in 2004 demonstrated that, despite its late involvement in the process, the community was given the power to reject the EA policy. In Shaldon, the issue for the community was that it lacked the necessary human capital to judge the merits of the EA proposal. In this respect, the newly created CISC and the investment in a local FRM coordinating role (the community liaison officer) was important to make the engagement both credible and successful.

From this analysis, the author judges that Homan (2003) appears to be correct in her assessment that expert elites dominate the FRM system. What this research has also revealed is that elites are more evident at sub-regional level, where role institutions are most significant. At sub-regional level, the expert elite play a fundamental role in both the development and implementation of FRM policy. Across all levels, the expert elites mainly occupy roles specific to FRM, emergency planning and development planning and are generally remote from the community. The suggestion from interviewees was that resource constraints

are limiting the level of CISC that can be achieved between the elites and the local communities, thus exacerbating the sense of remoteness. There was also little evidence collected for this thesis to suggest that the power of the expert elite is being divested to local communities. However, there was evidence of elites trying to push responsibility onto local communities, who were sceptical of such efforts unless accompanied by a corresponding increase in capital assets needed to enact such responsibility. As long as CISC is limited, and resources controlled by elites in a few institutions at the core of the FRM framework, then the expert elites will continue to control how flood risk is managed at local community level.

Above county level, data collected from the community survey, was clear in revealing that CISC between the community and the regional level was not well recognised by the local communities. That said, there was overwhelming evidence from data collected for this thesis that the EA has invested heavily in CISC at all levels and is shouldering the burden of responsibility in representing the national level on issues to do with FRM. This is interesting because the national level is the only level where considerable investment has been made into CISC that actively engages multiple viewpoints as part of the FRM system. Below the national level, FRM policy development and implementation was dominated by a few public sector institutions. The only national level industry, other than the EA, with a credible level of CISC at the community level was the insurance industry. However, CISC involving the insurance industry was only manifest in two ways: first was in influencing national policy and second was in direct contact with flood victims. CISC engagement by the insurance industry at all other levels seemed to be absent.

#### **7.4.4 Public-private initiatives in FRM to improve community resilience**

The latter point in the last paragraph above provides a useful illustration of the need for large parts of the FRM framework to invest in CISC that engages with the private sector. This idea was prompted by the research of Hollnagel *et al.* (2006), Pickett *et al.* (2004) and supported by Demeritt and Norbert (2011) and Demeritt (2012) who all stressed the importance of cross-sector collaboration as a means of enhancing community resilience. As mentioned above, data collected for this thesis did reveal that below the national level of the FRM framework, such cross-sector CISC was in short supply.

National level CISC links did provide private sector institutions with a means to support institutions in the FRM framework, but these links were not evident within the case study communities. Respondents to the questionnaire survey highlighted insurance as the key economic capital resource in their armoury, which they used to create some resilience to flood risk (Chapter 6). However, action by the insurance industry to highlight flood risk in the case study communities was not evident. The author suggests that the lack of private sector institutional support goes some ways to explain why CISC investment within communities was directed towards “family”, “friends” and “work colleague” networks. In all three cases study communities, CISC links to these networks were identified as the most important in helping community members recover from flood events (see analysis in Chapter 6 for details). However, these informal networks were a poor replacement for CISC links to private sector institutions with a special interest in FRM, as they had no systems for planning to improve resilience at either the individual or the community level.

The main expectation in this research was that private sector institutions situated in the case study communities might have collectively invested in CISC to address the threat of flooding and to help the community recover from a flood event. However, evidence of collective action by the private sector was largely absent. The interview with the community liaison officer illustrated the problem of a lack of engagement by the private sector very well:

*“At a recent meeting many of the sub-groups were there but most businesses were not as they were too busy running their businesses, and this is one area where I feel I have failed – in creating some sense of a business “community”. I cannot get the message through that it will benefit you if you become a part of a whole. Transition town is the group that is trying to get the community to face issues to do with long-term sustainability issues (started in Totnes and now a national movement). They are trying to engage with the community, but this is where the localism thing doesn’t quite work because you do need a body of people who are paid to deliver that in order to have it there, I don’t think you can rely on the community and the business community. People want a body that acts as a parent - they do not want to do it themselves.” (Interview 3)*

In summary, this analysis reveals that there is significant potential for CISC investment that enhances private sector engagement in the FRM system. That potential exists below the national level, but the author found no evidence of the public sector institutions operating at those levels actively promoting such investment. If communities can be motivated to take action and protect themselves from flooding, then the private sector will be able to provide a great deal of assistance. The problem seems to be that communities expect the public sector to provide all necessary protection, and that obviates the need for the community to protect itself. This expectation is supported by public sector institutions operating below the national level that have not encouraged communities to engage with the private sector.

#### **7.4.5 Lessons learned**

This section set out to assess the extent to which the flood risk management institutions have moved beyond traditional approaches to hazard management to incorporate recommendations made by previous research. It analysed evidence of movements to include elements of vulnerability assessments, pre- and post- event planning, the inclusion of multiple viewpoints in planning decisions and the engagement of both the public and private sector in resilience building efforts, and it identified areas of opportunity where CISC may be used to enhance community resilience.

From that analysis, the FRM system that operates between the district and national levels was found to have a strong and robust policy framework that effectively incorporates the latest academic thinking on resilience based planning. Where the system fails is at local level, which is important, as this is the level where current government policy is pushing for greater decision-making to be based. The evidence uncovered by this thesis revealed the important role played in facilitating more effective planning at the local level by both the EA and the district council. However, in the Teign Estuary area the district council role was judged to be unusual, or non-traditional, and looks set to change. As such there will be an opportunity/need for the county council to invest more heavily in FRM CISC if efforts to enhance community resilience started by the district council are to be sustained. In that respect the author found no evidence of enthusiasm from the local councils or active intention by the county council to pursue such an investment.

The EA has been referred to throughout this thesis as occupying a central role in the FRM system. In this section, its role was characterised as newly

emergent and thus non-traditional, but it has amassed a great deal of CISC and other capitals that make it an essential part of the FRM planning and policy implementation process. The EA is a semi-independent body that bridges the public-private sector divide and serves as a powerful reminder of the value private sector institutions can play in the FRM system. The involvement of the private sector was judged to be strong at the national level, but weak at all other levels, and there did not appear to be any current moves to promote private sector involvement below the national level. The latter point was presented as a major opportunity area for the development of CISC that will have a positive impact on the enhancement of community resilience in flood risk communities.

## **7.5 Conclusion**

In this chapter, the concept of resilience was revisited and outputs from the analysis in Chapters 4, 5 and 6 were merged with interview and questionnaire survey data to develop new and deeper insights into the concept of community resilience. The discussion started with an assessment of the four communities studied as part of this thesis using a maturity model drawn from research into resilience development in individuals. The community level maturity assessment was used to add depth to the form and function of the community-based FRM group and role, proposed in earlier chapters. Subsequent sections of this chapter then augmented the maturity based proposals with a detailed individual assessment that sought to highlight generic and specific resilience traits for the FRM role incumbent and recommendations for action by FRM institutions.

Table 7.5 below summarises the findings from the assessment using the resilience maturity model in the study communities.

**Table 7.5 Summary of community resilience assessment using maturity model**

(Source: Author)

Community	Exposure to events	Self-reliance & Wisdom	Awareness & Recovery
<b>FRM Framework</b>	Low High High	High High High	Moderate High High
<b>Newton Abbot</b>	High High Low	Low - -	Moderate Moderate Low
<b>Teignmouth</b>	Moderate Moderate Moderate	Moderate - -	- - Moderate
<b>Shaldon</b>	Low Low High	High High Low	Low Low Moderate

**Key to assessment:** Top = Adult level, Middle = Adolescent level, Bottom = Child level

In relation to the three broad strands of the maturity assessment model, the “exposure to events” strand was the only one where a reasonable assessment was able to be made at all levels and in all communities. In the other two strands, ambiguity in the data left some elements of assessment unclear. The lack of clarity stemmed either from the failure of communities to engage in actions that would make assessment possible or due to lack of recent data which made the memory of events unclear. The lack of clarity was evident in the two communities where there was evidence of fragmentation (see Chapter 6 for details). It is conceivable that, if proposals to improve CISC within the fragmented communities by creating a flood group and investing in the creation of a community based flood risk role, then relevant data and the flood risk memory would be improved and preserved. Looking more closely at the study communities, what was interesting was that there was no regular pattern

emerging of strength at lower (child to adolescent) levels, while diminishing trends were more obvious at higher levels (adolescent to adult).

The FRM framework was consistently strong and only weak in the experience and recovery from catastrophic events. Any weakness in the FRM framework could easily be addressed using CISC to international level entities. The international links are currently limited, but by building links to communities that have experienced catastrophic floods the resilience of the UK FRM framework community would be enhanced.

In Newton Abbot, the community had strong adult levels of experience and the memory of the recovery from the acute event of 1979 was still strong. It is possible, however, that action taken in response to the 1979 flood (building of the Holbeam Dam) and the lack of recent floods has inoculated the community against the on-going threat of tidal flooding. The consequence for Newton Abbot is a lack of self-awareness and no evidence of a need for self-reliance. Newton Abbot may be judged to be on a trend of diminishing resilience, down from a high after 1979 and forecasted to continue its decline into the future. To halt the slide in the resilience of the Newton Abbot community, the proposals in Chapter 6 to invest in CISC with the creation of a local flood risk group and a local flood risk officer role would greatly assist the community. Engagement of the town and district council as links into the FRM framework would need to be created. In addition, and in response to the rising prominence of the county council in the FRM framework, the community should take action to create CISC links with the council flood risk team. It is likely that the actions in Newton Abbot would create mainly passive CISC, and although flood planning and plan exercising can help to maintain levels of potential resilience, it would need a flood event to fully

realise the benefits of this investment into CISC. CISC is generally low in the Newton Abbot community, it can be expected that the proposed investment will be difficult to achieve.

In Teignmouth, there was evidence of regular, if small and localised, flood events. In a manner similar to Newton Abbot, there was also evidence of quite catastrophic events in the distant memory of a few community residents, but actions taken to improve local drainage had largely inoculated the community against the on-going threat of tidal flooding. Some recent “near-miss” events had occurred that had rekindled the awareness of the local flood risk and the experience of refusing help from the EA in 2004 was sufficient to mobilise a section of the community to invest in some CISC by creating a local flood group. That investment appears to have paid off, as when the EA returned in 2009/10, the community was able to embrace the new opportunity and secure the investment of considerable economic and physical flood risk capital in their community. The mechanisms by which the capital investment in Teignmouth occurred are outside the scope of this study, but the evidence is sufficient to judge that Teignmouth (like Newton Abbot) has been on a downward decline in its levels of flood related resilience. When the memory of old flood events faded, resilience fell. When the threat re-emerged, the community invested in CISC and was able to restore a significant amount of resilience. It is not clear if the flood risk group has disbanded or if a permanent local flood risk role has been created, but these issues will determine if the level of resilience continues to rise or begins to fall again.

Shaldon presented the most surprising result as it had the lowest levels of experience and evidence of recovery from flood events, yet it was most active in

dealing with on-going flood risk. Key to the Shaldon community success in dealing with the threat of flooding was its self-reliance and wisdom. Shaldon also possessed a high level of CISC and it is possible that this enabled the community to recognise and exploit an opportunity to increase its capital resources when approached by the EA. The community did not actively seek the input of the EA. In fact, as this analysis shows, the community was largely unaware of the flood risk prior to being approached by the EA. The high level of CISC and the congealing effect around a local institution within the community facilitated the rapid creation of a special interest group/working party to deal with flood risk issues at community level. It was also interesting that the group was disbanded after the plans for the flood defence wall were enacted, replaced by a flood warden group. It is possible that this adaptability was made easier by the high level of CISC in the community.

What the Shaldon case reveals is that CISC plays an important role in creating resilience potential in communities. The only true test of a community's resilience is experience of a flood event, but in the Shaldon case, the community actions have reduced the likelihood of such an event occurring in the future. In Shaldon, the high level of CISC was critical in enabling a rapid rise of awareness and engagement of the collective wisdom of the community, which was possibly the best outcome in the absence of an actual flood event. In Newton Abbot and Teignmouth, potential resilience was seriously undermined by fragmentation of the CISC network. Despite experience of flooding in Newton Abbot and Teignmouth communities, failure to invest in CISC will limit the ability of the community to improve its resilience potential. CISC is thus demonstrated to play a key role in the process of building community resilience.

In the context of this research, the main purpose of the CISC is enable flood risk communities to access economic, physical and human resources of the FRM community. It is clear from evidence presented in this thesis that essential resources are spread through all layers of the FRM network. It is also clear that more consideration is needed about how CISC should be developed between the FRM framework and flood risk communities. Evidence from the Shaldon case study suggests that CISC links to local, district, county, regional and national levels of the FRM framework are needed to improve the resilience of a community exposed to flood risk. But, what is also revealed in this chapter is that new CISC links are needed to private sector institutions as well as the public sector.

In many cases, flood risk communities and FRM institutions are passive, waiting for the other party to invest first in flood risk CISC. There is a perception in the FRM community that limited resources preclude the initiation of CISC to every flood risk community. However, as demonstrated by the Shaldon case, as long as CISC within the flood risk community is high, FRM institutions need only invest in CISC with each community for short periods of time. Regular investment is needed to prevent levels of potential resilience diminishing over time. As such, a staged process of investment is advisable: first, investing in the creation of flood risk CISC within the flood risk community. Second, is to invest in CISC between the flood risk community and all levels in the FRM framework. Third, is to invest in short (say annual) refreshing of CISC links to maintain resilience potential. CISC links should focus on ensuring that communities and institutions are aware of available resources and know how to deploy resources in the event of a local flood event. That said, within the community some longer-term stability is required and this chapter has helped to illustrate how

investment in the creation of a local FRM group and role with a role incumbent that has strong resilience building traits will greatly assist in the realisation of all above recommendations.

## Chapter 8 Conclusion

## 8.1 Introduction

At the start of this thesis, the author stated that the aim of the project was to examine the concept of community resilience by exploring the relationship between institutions involved in flood risk management and communities at risk from flooding. In particular, this research worked to develop a deeper understanding of how institutions and communities can enhance community resilience through actions that engender social capital derived from community-institution links (CISC). The project aim was divided into four objectives and this chapter presents a reflective narrative that is structured around issues to do with each objective.

Section 8.2 reflects upon the first objective, which sought to deepen the established understanding of the community resilience concept. There are four parts to the reflection in Section 8.2; in the first part challenges presented by the interdisciplinary nature of the research approach are discussed in relation to experience of other contemporary research projects (Herve and Millier 2014, Nel et al. 2014, Rutting 2014). The second part examines learning related to a building dualism in resilience research, a dualism signified by the growing tension between research focussing on either the outcome or the process of resilience building (Bene 2014, Wilson 2012 & 2014). In the third part, understanding developed by this thesis that informs debates surrounding conservative norms inherent in the idea of community resilience are explored and is contextualised by reference to arguments presented in a paper by Mackinnon and Derickson (2013). In the final part, a paper by Butler and Pidgeon (2011) is used to add context to insights derived from this research

about resilience and its links with State efforts to off-load protective responsibilities onto civil society groups.

Section 8.3 addresses the second and third objectives of the thesis, exploring FRM institutions and flood risk communities in order to reveal lessons about their interactions that may lead to enhanced community resilience. The section is divided into three parts. First, lessons learned from this thesis about CISC in the FRM framework are consolidated by drawing together three separate areas of analysis in the thesis, two from Chapter 4 (spatial scales of operation of FRM institutions and FRM institution openness) and one from Chapter 6 (CISC in the FRM framework). In the second part, contributions made by this research to the academic understanding of the community concept are examined: exploring criticisms made about the utility of the community concept (Amit 2002, Day 2006, Delanty 2003), changing roles of community elites (Anderson 1983, Bell and Newby 1971, Crow and Allen 1994, Hill 2000) and the relevance of the “community of crisis” (Booth-Fowler 1995) concept for community resilience research. For the final part, two recent papers, one by Burningham et al. (2008) and one by Harries (2012) are used to help build an understanding about how CISC can be harnessed to enhance community resilience and improve the lived experience of communities exposed to flood risk.

Section 8.4 presents proposals relating to the final thesis objective. In this section, proposals derived from the deepened understanding of community resilience are put forward to illustrate how a CISC based approach to community engagement can be helpful in improving elements of FRM policy and decision-making that aim to achieve enhanced community resilience. The final section (Section 8.5) reflects on avenues for future academic research.

## **8.2 Deepening the established understanding of the community resilience concept**

This section reflects on the implications of the findings about resilience to flood risk and, in so doing, it will cash out the conceptual promises made in the introduction chapter about community resilience more generally. The reflective narrative is divided into four parts. In the first two parts (Sections 8.2.1 and 8.2.2), promises made to develop a deeper understanding of community resilience are addressed, first by reviewing the interdisciplinary approach used for the analysis of the case study communities and second by reflecting on the divide pointed out by the author in Chapter 2 between research focussing on resilience outcomes and resilience building processes (resistance versus resilience). The analysis in Sections 8.2.1 and 8.2.2 is brought up-to-date, by contrasting lessons learned from the thesis with contemporary ideas about resilience research, ideas derived from a conference about resilience, held in Montpellier, France in May 2014.

The final two parts of the reflection (Section 8.2.3 and 8.2.4) critically examine the norms implicit in the idea of resilience, considering issues to do with resilience as a means to off-load the State's protective responsibilities onto civil society groups and questions of whether or not resilience is an inherently conservative concept. By way of framing the critical reflection in Sections 8.2.3 and 8.2.4, comparisons are drawn between understanding about resilience derived from this thesis and two recent articles, one by Butler and Pidgeon (2011) and one by MacKinnon and Derickson (2013).

### **8.2.1 Bridging the divide between separate furrows of academic research**

At the start of this thesis, the author stated that, in the years preceding the commencement of the project, both academics and practitioners had shown a growing interest in the resilience concept. Subsequently, as this thesis has developed, the author observed how the work of the Resilience Alliance (RA) and the Stockholm Resilience Centre (SRC), have further popularised the study of resilience. Within the on-going discussions about resilience, the interdisciplinary nature of the concept is a sub-text that is also increasing in prominence (Herve and Millier 2014). That sub-text was posited by the author as one of the main reasons why this research was needed, so this section will reflect on progress made towards understanding and addressing that need.

When developing the framework to study community resilience in this project, the author drew heavily from published literature in the fields of geography, sociology, anthropology, psychology and philosophy (Benko and Strohmayer 2004, Berg 2003, Bergen and Luckmann 1966, Cloke et al 1991, Daniels et al. 2001, Jacelon 1997, Knox and Pinch 2000, May and Williams 1998, Paton and Johnson 2001, Paton 2003a and 2003b, Paton et.al. 2000, Rogers and Viles 2003, Searle 1995). Those disciplinary fields were all contributing to the understanding of social resilience and all had strong, but distinctly different, cognitive traditions. It was that multitude of theoretical traditions that hinted to the need for this project. The author's specific contention was that each academic discipline was ploughing ever deeper furrows of knowledge, but there was scant evidence of research that aimed to bridge the disciplinary divides. In the context of community resilience, this divide was seen as a detriment to the development of the concept and, as this thesis drew to a close, the

Resilience2014 conference revealed that other researchers (Herve and Millier 2014, Nel et al. 2014, Rutting 2014) were beginning to express similar views.

Rutting (2014), in particular, was helpful in describing approaches that have utilised multiple disciplinary perspectives for resilience research. He described these approaches as grouped into three categories of research; transdisciplinary, multidisciplinary or interdisciplinary. In transdisciplinary research, ideas from cognitively distinct fields (say academia and practice) are blended to learn lessons that deepen existing understanding in one or other field of enquiry. Interdisciplinary research was a less extreme form of merging; blending concepts from sub-fields within similar discipline areas (say academic arguments from the fields of human geography, sociology and anthropology). Finally, multidisciplinary research engages with multiple subject areas, bridging across the cognitive divide to deepen learning outcomes, but reporting separately on the findings within the context of each discipline area. Such a clearly defined understanding of resilience research would have been helpful to the author at the start of the project, enabling him to plan a trajectory that engaged more formally with one or other approach. Instead the thesis engaged with all three approaches, somewhat blurring the contribution to any specific sub-discipline and, according to Rutting (2014), reflecting a criticism that is a commonly attributed to research projects of this nature. The research approach for this project may have started as transdisciplinary, becoming interdisciplinary in the analysis chapters and multidisciplinary towards the conclusion. The latter assessment reflects how ideas from academia and practice were analysed, but the outputs were framed separately for academic and practitioner communities.

To Nel et al. (2014), transdisciplinary results can be achieved naturally through multi-disciplinary team working. In this research, the author (a Civil Engineer) and supervisory team (two Human Geographers) provided some basis for multi-disciplinary working. However, the project also needed a strong cognitive framework if truly transformative results were to be achieved (Nel et al. 2014). In that context, this project sought to bridge the divide between a psychology-based understanding of resilience maturity in individuals and applying that understanding to the study of resilience of communities in a human geography context. Lessons learned from the maturity model approach were used to develop proposals for practitioner communities (see Chapter 7 and Section 8.4 below). The complex and novel approach was challenging to apply in practice and, as a consequence, the author was unable to convince several FRM institutions to engage deeply with the research. However, one such institution, the EA, after declining to engage at the interview stage of the project, subsequently expressed an interest to engage in a follow-up study to learn more about the community engagement proposals included in this thesis. The lesson highlighted here is that the merits of transdisciplinary research are difficult to convey to some stakeholders and, in this study, the author would have benefitted from addressing stakeholder apprehensions more rigorously at an earlier stage in the project.

### **8.2.2 Deepened understanding of the resilience outcome versus the resilience building process debate**

In Section 2.2 of this thesis, the author described a bifurcation in resilience research, focussing either on resilient outcomes or resilience building processes (Cairns 2002, Doron 2006, Mallak 1998, Pickett et al. 2004, Ramutsindela 2007,

Woods 2006, Wreathall 2006). When exploring FRM resilience in the case study communities, the author found evidence of the bifurcation in references to what may be described as a debate about resistance versus resilience. One interviewee made specific reference to “over resilient communities” (Interview 05), an idea that resonated well with findings from other recent research. Specifically, some presenters at the Resilience2014 conference discussed the idea of “bad resilience” (Bene 2014) and “strong resilience” (Wilson 2014). Mackinnon and Derickson (2013) summarised this viewpoint well, describing how the expanding norm of resilience in UK government policy stems from a simplistic belief that community resilience is “assumed to be always a positive quality, imbued with notions of individual self-reliance and triumph over adversity” (MacKinnon and Derickson 2013, p 259). To the author, the bifurcation of research strands, focussing either on the resilience outcome or the resilience building process, runs the risk of producing findings that construe resistance derived from high levels of community resilience as a negative outcome. In this thesis, the assertion that institutions favour simplistic approaches to community analysis was found to be valid (Chapter 4), and that simplistic approach means that institutions are the most likely parties to interpret findings of resistance to their attempts to implement a resilience building process as a negative outcome.

There was little evidence in the case study data to reveal if the negative connotations of resilience, as outlined in the last paragraph, are understood by FRM institutions. However, several of the interviews (Interview 01, 02 and 05) did reveal evidence of community resistance to resilience building efforts by FMR institutions. To the author, the findings from this research suggested that some FRM institutions want community resistance (and thereby resilience) to

be weakened in some instances. That interpretation correlates with Bene (2014), who found that institutions sometimes desire a weakening of community resilience in order to enact a transformative process within the community. The idea that resilience building may need to start with a process of resilience weakening is novel and not well described in the academic literature.

The fact that this research picked up on the issue of overly resilient communities, and that other researchers are also encountering the issue, suggests that this topic may be growing in importance. Unfortunately, this thesis was unable to explore the implications of this specific finding in any great detail, but it does highlight a cautionary note that has implications for the utility of proposal developed in this thesis. Namely, that if proposals lead communities to achieve levels of resilience that are “too strong” (Wilson 2012 & 2104), the FRM practitioner community may view this as a negative outcome.

### **8.2.3 Conservative norms implicit in the idea of community resilience**

According to MacKinnon and Derickson (2013) the concept of resilience, drawn as it was from the field of ecology, is too conservative a concept for application in a social context. To them, ecologically based, naturalistic concepts and metaphors provide the grounding for much resilience policy and, as such, imbue the policies with features that do not fit well with the social context in which they are applied. Those limitations stem from the apolitical nature of such concepts, which introduces the risk of normalising established social structures and their associated power relations, which in-turn may lead to a closure from critique and a perpetuation of social injustice (ibid). In this thesis, the analysis of the FRM framework revealed that, at the national level, resilience policy normalised the use of multiple stakeholder perspectives when engaging in policy

development. Those perspectives were drawn from civil contingency, urban develop and environmental policy networks. The author judged that such a broad input, when developing national level resilience policy, would be effective in engaging socio-political viewpoints from the civil contingency and urban planning networks with eco-naturalist viewpoints in the environmental planning network, thereby refuting claims made by MacKinnon and Derickson (2013).

That said, the findings in this thesis also revealed two important changes to the framework below the national level. First, there was a dramatic reduction in the numbers of stakeholder institutions engaged in FRM policy development from the three policy networks and second was the rise in importance of role institutions (mostly public sector role institutions). In the author's opinion, below the national level there is a risk that efforts to normalise community resilience to flood risk could be hijacked by a handful of influential role incumbents. These role incumbents have the power to operate conservatively, as described by MacKinnon and Derickson (2013), or operate in a more socially progressive manner. In Chapters 6 and 7, the author outlined how communities can mitigate such risks by investing in CISC to create a local FRM institution and recruit a community based FRM role incumbent. Such actions would enable the community to circumvent non-progressive local power structures, creating links to multiple stakeholders and thereby normalising a more socially-just resilience framework.

MacKinnon and Derickson (2013) also considered that the new resilience norm is conservative in its nature because it has embedded within it the dominant ecology in UK political dogma, namely capitalism. Such a dogma can subordinate communities under the imperative of achieving an "externally

defined greater resilience” (p 261). For MacKinnon and Derickson (2013), when building resilience, the normative desirability of democratic self-determination should be the starting point for an expansive social politics, fostering translocal relations between communities and challenging institutions that support the operation of a capitalist dogma (ibid). It was beyond the scope of this thesis to analyse links between FRM policy and capitalist dogma, but this thesis did find that FRM resilience is an external defined philosophy espoused by technical expert elites. Importantly for this discussion, the imperative to address local FRM issues was always externally driven. In fact, before being approached by the external FRM institutions, this research revealed (in Chapter 5) that none of the three case study sites proactively sought greater resilience to the local flood risk. To the author, that would suggest that, an externally defined greater resilience “vision” is an essential starting point, needed before the communities can engage in a process of democratic self-determination.

The expectation within the new FRM policy norm is that individuals will “engage with the process of responsabilisation and actively negotiate their roles as governable entities” (Butler and Pidgeon 2011, page 539). However, evidence from this study showed that even the most active community, Shaldon, had to be convinced of the need for greater community resilience to the threat of flooding, and the legacy of an on-going commitment to maintain levels of resilience via the flood warden scheme is an on-going concern for the community (Interview 02). In both Shaldon and Teignmouth, the local community was allowed to challenge the resilience building policy. However, when challenged in Teignmouth, the state response was to withdraw support for the resilience enhancing scheme. To this end, the author suggests that the purpose of the community engagement in resilience building measures served

the interests of the FRM institutions first and the community interests second. Such a finding could be construed as evidence of a capitalist dogma (as suggested by Mackinnon and Derickson 2013) being applied in practice by expert elites that are external to the community, but it seems that the community was able to apply some level of democratic self-determination to the process. Such a normative mode of operation is less ideologically pure than MacKinnon and Derickson (2013) would suggest, pointing to a reality that is less conservative and where pragmatism reigns, enabling solutions to be found that effectively balance the competing interests of the community and the state.

#### **8.2.4 Resilience as a means to off-load the State's protective responsibilities onto civil society groups**

Throughout Chapter 2, the author highlighted critical concerns raised by some researchers that resilience is being used by the State to off-load its protective responsibilities onto communities (Crow and Allen 1994, Delanty 2003, Hill 2000). Towards the end of this project, Butler and Pidgeon (2011) published findings from their research that usefully served to up-date the on-going debate and to contextualise lessons learned from this thesis, lessons that can deepen the current understanding of issues raised.

Butler and Pidgeon (2011) studied how new norms within FRM policy are seeking to “enrain” citizens within the FRM system. The entrainment encourages citizens to take an active role in solving problems at the local level. But, when approached, local populations are advancing a sceptical narrative, reflecting an entrenched belief that FRM is a government issue (ibid). Views such as those expressed by Butler and Pidgeon (2011) were not very evident within the flood risk communities surveyed for this thesis, rather the public

response revealed an apathetic attitude towards the local flood risk (as outlined above in section 8.2.3). However, this research did find evidence of such views in the institutional interviews. The author would suggest then, that the sceptical narrative described by Butler and Pidgeon (2011) is much more entrenched within the FRM institutional elite and not the flood risk communities. Butler and Pidgeon (2011) also explained that disillusionment at government action to address flood risk issues diminished opportunities to engender reciprocal relations of responsibility, relations that are essential if any off-loading of state protective responsibility is to be achieved. For the author, the disillusionment of the public should be a less pressing concern than disillusion within the ranks of the FRM professional elite. As such, a deeper understanding of issues troubling the FRM professional elite is needed and will be explored further below.

By way of contrast to the thoughts of MacKinnon and Derickson (2013), Butler and Pidgeon (2011) considered that active and effective expert elites are essential to operationalise the new norms in FRM policy. Specifically, the elites are required to “tutor individuals as to the ways of living that will accomplish normality” (page 536). The new FRM policy norm draws expert elites into the problematisation of FRM governance, a move which takes them beyond the mere calculation of risk to a place where they assume responsibility for issuing advice and managing the strategies intended to mitigate the effects of flooding. However, changes to the FRM framework, stemming largely from the Pitt Review (2008), the Flood and Water Management Act (2010) and the Flood Risk Regulations (2009) have blurred the boundaries of responsibility within the expert elite community (Butler and Pidgeon 2011). The findings by Butler and Pidgeon (2011), relating to the problems inherent in defining new boundaries of responsibility, resonate well with findings of this thesis, and were the subject of

extensive analysis in Chapters 5 and 7. The author deduced that the new norm was one supported by national level governance bodies, pushing decision-making down to levels where they perceive that a simpler system of working to exist (Section 5.4). In that way, the author judged that community resilience is a philosophy espoused by powerful national elites, a result that contradicted Bauman (2001), whose research suggested that community resilience would be found to be a philosophy espoused by the weaker elements of the FRM community.

Related to the point made in the latter part of the last paragraph above, resistance to new policy initiatives set by national level institutions mirrored the pattern of winners and losers in the (re)distribution of capital resources resulting from the Pitt Review and subsequent legislation (see Section 6.4). The regional level suffered significant institutional losses, but little resistance was noted from remaining regional institutions, which generally benefitted from having a greater share of residual capitals. The county level did not resist policy initiatives and was receiving considerable new capital investment. The district was not happy with policy changes and was losing resources. Very few capital resources were reaching the local level and local level institutions were highly resistant to the new policy changes.

To the author, the finding from this research would indicate that challenges to the new FRM policy norms, whereby much of the State's protective responsibilities are off-loaded onto civil society groups, emanates primarily from within the FRM institutional framework. Concerns held by FRM institutions span two areas, first is a lack of clarity regarding the newly redistributed boundaries of responsibility and second is the (re)allocation of resources associated with

the new division of responsibilities. To the author, this this conclusion implies that until the institutional issues are resolved, the off-loading of responsibility onto civil society groups is unlikely to proceed at pace and issues of public concern are less likely to be raised to the fore, or be addressed.

### **8.3 CISC and community-institution interactions that enhance resilience to flood risk**

As described in the introduction to this chapter, this section explores FRM institutions and flood risk communities in order to reveal lessons about their interactions that may lead to enhanced community resilience. In section 8.3.1, lessons learned from this thesis about CISC in the FRM framework are consolidated by drawing together separate analyses conducted in Chapters 4 and 6. In section 8.3.2 the implications of the findings for the academic concept of community are examined and section 8.3.3 focusses on how CISC can be created and utilised in a manner that enhances the lived experience of communities exposed to flood risk.

#### **8.3.1 Lessons about CISC and what they reveal about the UK FRM institutions and communities at risk from flooding**

In Chapter 4, the framework of institutions with an input into the management of flood risk as it relates to the three case study communities was presented within a hierarchy of spatial scales (See Figure 4.9). Also in Chapter 4, linkages between FRM institutions were analysed to generate data about the openness of each FRM institution (Figure 4.10). Finally, in Chapter 6, the institutional links were analysed to reveal details about CISC in the FRM community. In this section, these three separate elements of analysis will be critically assessed to

reveal additional depths of understanding, beyond that revealed in previous chapters.

From the document analysis in Chapter 4, the author was able to identify FRM institutions and situate them within a hierarchical framework at the primary spatial scale in which they operated (Figure 4.9). Beyond the placement of institutions within a spatial hierarchy, this thesis was interested to discover which institutions had elevated status or a pivotal role when it came to dealing with flood risk issues in the case study communities. Qualitative data about status or pivotal roles was not very evident in the documents analysed, but interview evidence (Interviews 01, 02, 03, 04 and 05) provided a much clearer data set. Interviews revealed that the Environment Agency (EA) had both high status and a pivotal role within the framework, but also at the local level. The analysis in Section 4.5 revealed that the EA was unique, in working almost outside (and potentially independent from) the rest of the flood risk management framework. Two characteristics contrived to create a unique position for the EA: first was its ability to act at all levels in the framework, and second was its control over resources. Specifically, the EA was able to control a considerable amount of resources and that control gave it considerable status. So, status was judged as not necessarily linked to a pivotal role, but when a pivotal role is combined with control over resource then status is increased.

In Section 4.4, the openness of FRM institutions was examined, revealing a greater depth of detail about the links between status and the pivotal role played by institutions. Openness was measured by identifying the number of connections to other institutions in the framework (Figure 4.10). Within the context of the case study area, the dearth of county level FRM institutions

resulted in a bottleneck, with the County Council bridging the divide between district and local level institutions on one side of the framework and regional and national level objects on the other side. The openness analysis showed that the ability of the EA to create connections at all levels of the FRM framework enabled it to circumvent the bottleneck at county level. Unlike many other national level institutions, the EA's delegated responsibility gave it the authority to make contact with institutions at all levels of the FRM hierarchy without having to refer to, or rely on, the county to act as an intermediary. That has an important effect on resilience, as multiple connections provide alternative pathways for local level institutions to access the more powerful and resource rich institutions at regional and national levels. At this point in time, the alternative route is particularly important as the changes within the FRM framework (as described in Section 8.2 above) have transferred additional responsibilities to the county, creating a concentration of power at the FRM framework bottleneck. As such, the county is judged to occupy a pivotal role, but it has little status locally in the flood risk institutional framework, thus the entire framework is at risk of segmentation. Thus, the Environment Agency plays a crucial role in bridging the bottleneck and maintaining the resilience of the local FRM framework as the new norms in the system embed themselves.

Chapter 6 further analysed the links between institutions in the FRM framework to determine a measure of CISC and enabled a distinction to be drawn between institutions that form the core of the FRM framework community (C) and other, less engaged, institutions (I) (Figure 6.1). Distinguishing between a core group and other institutions enabled the author to identify CISC that was driven by the community in forming links with an institution (C>ISC) and manifestations where the institution was driving forward the links with the FRM community (C<ISC).

Figure 6.1 further emphasised the central role played by the EA, being the only institution at the core of the FRM community with reciprocated links to all other members of the core group. The county level institution was also clearly shown within the core group of FRM institutions, but Figure 6.1 was able to show how CISC was being created by other members of the core group to local level institutions, an activity that was weakening the potential power concentration in the County Council.

### **8.3.2 Implications of the findings for the academic concept of community**

When conducting research that explored the flood risk communities, the author was mindful that academic authors had questioned the utility of the community concept (Amit 2002, Day 2006, Delanty 2003). This thesis assessed the validity of that critique, by contrasting critical comments derived from the literature against findings from the exploration of how the flood risk management institutions apply the community concept in practice. The exploration reflected upon concerns about a growing divide between academic and institutional interpretations of the community concept (Gottdeiner and Budd 2005, Frankenberg 1969, Marsh and Buckle 2001). When looking at the traditional concept of community, this thesis found evidence to support previous research findings, in which institutions have been found to prefer older and simpler definitions of community.

Based on their simplified definition, institutions had developed a range of tools to help them engage with communities. The author used two such tools (namely flood risk maps and the land use classifications system) to commence this research. Using those industry tools, it was easy to identify the flood risk communities and sub-divide them into distinct sub-parts. From this platform, the

research was then able to apply more subtle academic techniques to develop a deeper understanding of the case study communities. However, when questioning community residents, the author found significant evidence of sections of the community that were either unknowledgeable about the flood risk or were in denial of the threat posed to them individually. The traditional community concept used by institutions was not very effective in dealing with those elements of the community and the concept needed to be enhanced with the more detailed academic understanding.

An important lesson from the community literature related to the effect that community based elites have on the goals and values of the communities in which they are situated (Anderson 1983, Bell and Newby 1971, Crow and Allen 1994, Hill 2000). This thesis analysed the extent to which the case study communities demonstrated stratification along the lines predicted by the published research and also assessed the significance of assertions made by some researchers that the power of the traditional elites in modern communities has been diffused (Amit 2002, Day 2006, Delanty 2003, Marsh and Buckle 2001). The analysis in Chapter 5 showed that traditional elites had seen their power eroded, as community members drifted away from membership of groups where the elites had traditionally held sway (Section 5.4). The analysis was unable to determine if the drift away from these institutions was due to higher than acceptable sacrifices required by individuals or overregulation by community elites. However, the diffusion of the power held by local elites was a problem for state institutions seeking to engage with the community (Interviews 01, 03 and 04). It was difficult for the FRM institutions to know which community institutions to trust and which community elites represented the community most effectively. As the communities got larger, this problem became more acute

(Interview 05) and the evidence from this research suggested that only the smallest parishes and rural communities possess structures that enable easy interaction with external institutions.

The significance of the idea of communities of crisis was also explored. Communities of crisis were described by Booth-Fowler (1995) as temporary communities, quickly created and quickly fading. In the Shaldon example, a community of crisis was quickly established when they were advised of the potential flood risk to the community (Interview 02). The threat to the community was made clear by the Environment Agency, who proposed a new flood defence scheme. Here, the parish council's use of working parties facilitated the formation of a temporary flood risk community. Community residents could opt-in or out, but the process was controlled by the parish council. The system retained some legitimacy because the parish council had a remit to represent the entire community and was able to ensure that no single minority dominated interactions with the Environment Agency.

The author also applied the community of Booth-Fowlers (1995) community of crisis concept to the FRM framework and found evidence of changes to the FRM community after crisis events. In the FRM framework, the author judged that crisis events enhanced the community, but it also led to increased policy complexity (Section 5.6). Unlike the flood risk community of crisis, the policy based crisis community did not fade with time. In the policy framework, crisis events triggered spikes in policy development, shifts in emphasis and changes to the distribution of power. The permanence of the policy community of crisis in the FRM framework resulted from the permanence of the policy edifice created in the wake of the crises.

Long-lasting edifices created by flood risk communities could also be seen in the case study areas. Those edifices were physical, real world constructs, dedicated to traditional community based institutions, where elites had historically held sway. The edifices help to preserve a memory of old ways of doing things (tried and tested ways). In times of crisis, they provide a focal point around which the community can congeal. These traditional (but now less used institutions) provide the hierarchies needed in times of crisis to create the thin, tyrannical structures that can coerce the community to overcome challenges and survive crises (Booth-Fowler 1995). After the crisis, individuals are free opt-out if they wish and return to their less-regulated social networks.

### **8.3.3 Creating and utilising CISC in a manner that enhances the lived experience of communities exposed to flood risk**

One of the realities of modern life in flood prone communities is exposure to campaigns by FRM institutions that aim to raise awareness of the local flood risk. However, despite considerable efforts expended by FRM institutions, a significant proportion of householders nationally remain unaware of the local flood risk (Burningham et al. 2008). To Burningham et al. (2008), the deficit in awareness was caused by a divergent understanding, between FRM experts and members of the public, about the value to be placed on the information issued. To address the deficit, a more sophisticated definition of awareness is needed: one that allows people to appraise information using locally based contextual factors, such as experience and trust in the source of the information (ibid). For such a system to work, FRM expert elites must negotiate with the public to help them accept the information provided, but that negotiation needs

to be done in a way that does not raise anxiety, cause embarrassment or discourage local action.

The situation described above provides a good context to illustrate how recommendations made in Chapter 6 relating to CISC can prove valuable. In particular, recommendations to promote investment in the creation of a local FRM group and a local FRM role show how a route can be opened for effective FRM institution-community negotiation. Anxiety and embarrassment are mitigated by the local FRM role incumbent, who has the capacity to accrue FRM capitals and translate institutional information, taking on board local contextual nuances. Trust is an important outcome from CISC investment, and the trust developed between the FRM institutions, the local FRM group and the local FRM role incumbent would greatly improve the effectiveness of awareness raising campaigns.

Burningham et al. (2008) also identified a series of issues associated with the lived experience in a flood risk community that actively hamper risk awareness raising efforts. First was that a lack of flood awareness was not always the fault of the living flood risk community. In many cases, experts did not pass on important information, local information was simply absent, the information provided was difficult to understand or experts provide conflicting assessments of the local risk. Experience was also not an effective gauge of awareness, as lay knowledge was often judged by FRM experts to be wrong, leading to incorrect judgements like; "it won't affect me", or "it won't happen again" (Burningham et al. 2008, p 540). Finally there was the harmful mindset, termed by Burningham et al. (2008) as the "ostrich effect", where people simply deny being at risk from a flood. Denial, in this sense, is used to achieve psychological

relief from the anxiety that comes with the acknowledgment of being at risk from flooding. In relation to the last point, communities may simply lack concern about the consequences of a flood and thereby ignore expert advice or contest it.

By way of addressing issues highlighted in the last paragraph, lessons learned about CISC in this thesis point the fact that policies founded around the use of a single capital resource are often unsuccessful (Section 6.3). For that reason, this thesis suggested that efforts to engender CISC be coupled with efforts to enhance other capitals simultaneously. To that end, investment in the creation of the local FRM role was important and would have an impact in addressing many of the issues raised above. Defining the local FRM role in a way that obliges the incumbent to collect local and external human capital relating to the community flood risk is important in overcoming many of the problem issues surrounding information. As the capitals accumulate, the FRM role incumbent would accrue FRM cultural capital, which this thesis suggested could be used to address the “ostrich effect” and overcome harmful mindset within the community.

Harries (2012) explored the emotional responses of individuals living with the threat of flooding. He was concerned about a growing recognition amongst policy makers that, despite efforts to highlight the economic benefits of household flood protection measures, there was increasing evidence that households are not adopting protective behaviours. Harries (2012) found that awareness-raising could increase the anxiety associated with flood risk and, in those cases, the emotional response can act as a barrier to adaptation. There were caveats, however, as there were some indications that respondents to his

survey may have been in psychological denial, elevating the desire to feel secure over the fact of actually being secure.

The issue of communities not engaging with private sector FRM institutions, as described by Harries (2012) above, was examined by this thesis in Chapter 7. But, rather than citing anxiety as the cause, this thesis judged that the problem stemmed from the dominant role played by public sector FRM role incumbents. In that context, the role incumbents were focussed on public policy issues, often neglecting private sector solutions to the problems faced by local residents. This thesis proposed that investment in CISC by flood risk communities should address that issue directly, creating links which bypass public sector FRM institutions and enable direct entry of private sector FRM institutions into flood risk communities. A broader perspective, thus engendered, on options to mitigate flood risk at the household level may help to overcome issues of anxiety, remove barriers to adaptation and provide a basis to elevate “real” security over the “feeling of” security as identified by Harries (2012).

Harries (2012) also examined actions by the state, using financially based flood risk protection measures (insurance schemes), that aimed to improve the lived experience of a flood risk community. He found that such schemes are not universally successful and that new policies were being developed to normalise household behaviours using drivers that were not solely financial. It seemed that the new approaches worked where experience of flood events is evident. In those areas residents are sceptical of financial insurance as an effective solution and are more anxious about future floods, so they are more likely to implement other protective measures. By way of contrast, where there is a lack of experience of flooding, insurance was still seen as the best solution. But

insurance was also found to act as a disincentive to further adaptation using household level flood protection measures (ibid). Flood risk insurance in the latter situation feeds the psychological denial of the “actual” flood risk, nurturing the communities’ desire to feel secure above taking action to make them physically secure. In such cases, financially driven solutions to flood risk only serve to exacerbate the barriers to resilience-building adaptive action.

To some extent, the findings by Harries (2012), outlined in the last paragraph above, feeds into the earlier discussion about “bad resilience” outlined in Section 8.2, but in this case the bad effects stem directly from actions to enhance community resilience. CISC in this instance can again be utilised to diffuse such negative impacts. In Chapter 7, this thesis recommended that investment in community level CISC should extend to include links with other flood risk communities. That last area of investment enables lessons to be shared between communities, thereby facilitating exchanges between communities experienced with flood events to the benefit of inexperienced communities, overcoming barriers created by financially driven adaptive behaviours.

#### **8.4 Proposals for using a deepened understanding of CISC to improve community resilience to flood risk**

This section builds on the reflections in sections 8.2 and 8.3 to elucidate proposals that utilise the deepened understanding of CISC, developed in this thesis, in a manner that can improve the resilience of communities to flood risk. The context for this research was specific to the case study communities and the institutional framework used to manage flood risk in their areas, as a result

proposals based on this research are most easily applied to those communities and institutions. That said, some general proposals may be applied within a broader context and are considered in the narrative set out below.

One general proposal that arises from the findings in this thesis is that exposure to crisis events leaves a long-lasting legacy of highly resilient individuals (as shown by the Newton Abbot community). However, fragmentation of CISC within the community will have serious and negative impacts on the ability of the community to engage this residual legacy in resilience building efforts (Section 6.3.2). Where communities lack a history of flooding and, thereby, the legacy of resilient individuals with experience of local flood events (as with the Shaldon community), then strong CISC was found to be capable of enabling the community to work effectively in assessing and addressing potential future risks (Section 6.3.4).

The Teignmouth case study effectively demonstrated the impact that a mixture of commercial and residential groups within a community can have on its resilience. In Teignmouth, the two groups did not work well together, even though the flood risk threatened them both in equal measure (Section 6.3.3). Institutionalisation to create a liaison role, trusted by all groups, was proposed as a way to build CISC. The new CISC would reduce community fragmentation, help capture local knowledge and assist the community when mobilising its resources to take action against the local flood risk. Further institutionalisation to create a local flood risk group and a role within that group to coordinate actions taken by the group would also enhance community resilience (Section 7.2).

This thesis was also able to make proposals relating to FRM, both within the context of the case study areas and more generally. In relation to the case study areas, the most important proposal was that the District Council had historically played an important role in helping all three local communities to address flood risk issues. The District Council, as such, has had strong and active CISC that has been effective in enhancing community resilience. However, this responsibility is passing to the County Council and, at present, the County Council seems unaware, or at least under-resourced, to take on such a role (Section 6.2). In the context of this thesis, that lack of resource is symbolic of low CISC between the County Council and flood risk communities. The consequence is that the county council cannot fully engage with the numerous communities in flood risk areas and is forced to take a reactive position, acting only when prompted by a local community (Interview 04). The County Council CISC is thus judged to be largely passive and community driven (C>ISC) and, as a consequence, less effective in enhancing community resilience.

This thesis suggests that institutionalisation in the case study communities, resulting in the creation of community based FRM groups and the appointment of community based FRM role incumbents, will greatly assist in the creation of much needed CISC between the county council and flood risk communities (Section 7.3). The future role of the District Council is unclear, but it is possible that it may continue to use its high CISC capital in a facilitating role, bridging the divide between county and parish/town councils. That role should last as long as the district can maintain its high level of FRM capital resources, which are significantly greater than the local parishes or town councils.

Within the FRM system, the EA is currently the most important institution able to provide direct investment to meet a local need. The EA's role in FRM stands out as unique, as it has acquired the lion's share of FRM capital resources and it has very high CISC within the FRM framework. In addition, the EA has the ability to operate largely independently from the sub-regional FRM bodies (Section 6.2). In that respect, the EA can generate CISC directly with a community and work with it to address a local flood risk. The importance of the EA in FRM administration has grown significantly over the last decade, sometimes overshadowing the work of other FRM institutions. In many cases (like Shaldon and Teignmouth), CISC created by the EA directly with local communities means that the EA has become the public face of FRM policy and implementation. Despite being highly regarded and supported by the FRM professional elites, one possible consequence is that the EA may become the focus for public criticism when the public perceive FRM policies to have been ineffective in preventing further flood events. Fear of criticism is one possible explanation why the EA declined to participate in this research.

This thesis set out to explore the concept of community resilience, and in particular, the use of CISC to enhance community resilience. In doing so, CISC was found to be a useful tool in evaluating broad policy networks. CISC research itself was enhanced by the use of a social network analysis approach, which effectively conveyed the complexity of links within the multi-level FRM framework. From identifying the degree of openness (Section 4.4) to the separation of core institutions from the rest of the FRM framework (Section 6.2), CISC is revealed as a valuable research concept.

With regard to community resilience, the novel application of a maturity model to the assessment of resilience at the community level was also fruitful (Section 7.2). The model effectively highlighted the disparity between individual level resilience development and community level resilience development. The latter case differs from the former in the way that resilience maturity in a community may not progress in the same linear fashion that it does in individuals. As such, a community can exhibit traits of low level resilience and simultaneously exhibit traits associated with high level resilience.

This research also aimed to contribute to the improvement of FRM practice. In that respect, a number of weaknesses in the established system for the management of flood risk were identified and suggestions made to remedy those weaknesses (mainly outlined above in Sections 8.2). Moving beyond the specific points, this research was able to reassure FRM practitioners that their policy framework was, to a large extent, robust and in line with contemporary academic theory (Section 7.4). However, the author pointed to the fact that the FRM system, particularly as operated at the sub-regional levels, was dominated by small groups of expert elites (Section 4.6). These elites occupy powerful role institutions that dominate and influence policy development and implementation. The elites are almost exclusively public sector based and seem to be stifling the engagement of the private sector (Section 7.4.4). Where the private sector has been allowed to engage (at the national level), a broad diversity of input into the FRM system has been achieved (Section 4.3.5). This diversity would be beneficial to local flood risk communities and this research has contributed significantly to the argument in favour of their greater engagement.

This research has also illustrated the benefit of having clearly defined policy documentation. Specifically, documentation creates a durable edifice of data that researchers can use to analyse current and historic levels of CISC (Section 3.4.1). What was clear in this thesis was that such an edifice was largely absent at the community level. By emphasising the value of institutionalisation at local level to address flood risk issues, and by advocating that institutionalisation is used to create a community policy edifice, this thesis is contributing to the advancement of community based management theory and practice

## **8.5 Avenues for future research**

There are several areas where this research can provide a springboard for further investigation. Perhaps the most notable local example is in Teignmouth, where the local community at the start of this research was divided about the need for new flood defences. By the time this research was finished, the Teignmouth community had approved and implemented a new flood defence scheme. Actions taken by FRM institutions and the local community, in relation to the new flood defence scheme, were observed remotely by the author but fell outside the scope of the study. The Teignmouth project provides an ideal opportunity to assess the credibility of the numerous recommendations made in this thesis. Specifically, data collected for this thesis could be combined with a new study to provide a unique perspective on changes within the community and local FRM institutions, changes needed to ensure the scheme was successfully implemented.

On a more academic note, this thesis has investigated a form of social capital (Community-Institution Social Capital, CISC) that is not well developed in the established literature. Whilst this project has made considerable progress in building an understanding of CISC, and its relationship to community resilience, the proposals made offer useful pointers for further research, such as:

- To evaluate the role of community based, hazard specific role institutions in building CISC and amassing other hazard related capitals.
- To assess the effectiveness of a targeted investment in CISC, creating a hazard specific community based institution, in uniting the community and in taking positive steps to mitigate the risks facing the community.
- To examine the role of private sector CISC at the community level in promoting community resilience to levels beyond that which public sector only systems can achieve.
- To explore the efficacy of a maturity assessment model to measure resilience community at the community level.

The author is hopeful that the contribution made by this project to the established body of knowledge will be effective in inspiring others to continue the threads of research developed in the thesis.

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## APPENDICES

## Appendix I – Document Analysis Data

## Outline of Appendix I

Using a snowballing technique – taking references firstly from interviews and questionnaire respondents and then from citations within each document, 89 documents were identified for analysis. Documents were given a unique ID and classified according to the level at which they originated:

- 0= International level**
- 1= National level**
- 2= Regional level**
- 3= County Level**
- 4= District level**
- 5 = Local Community level**
- 6= Sub-local community level**

In addition detail of the Author, year of publication and Title were noted. Of the 89 documents 60 were reviewed in detail (Table A1.1). The 29 documents not reviewed were either classed as theory and not policy documents (11No), were International level and beyond the scope of this thesis (6No), were too site specific (3No) or were not found (9No).

When reviewing the 60 shortlisted documents, the number of references to the term flood (including floods and flooding) was counted and measure gained of references per page. This measure was used to make a qualitative judgement about how central to the policy document was the subject of flooding. Based on the citation measure documents were grouped into three clusters (Table A1.2). Where flooding was judged to be central to the document citations density was greater than one reference to flood in every second page (22No). Where flooding was judged to be secondary to the main focus of the document, citations less frequent the one on every second page (17No). The remaining

documents had not internal reference to flooding (21No). The latter group were documents cited by other documents in the first two clusters.

All of the 60 documents were reviewed to assess the extent to which they cross-referenced other policy documents (Table A1.3). Of the cluster where flooding was central to the document, eleven documents were closely aligned with other FRM policy documents (5 or more cross references). Seven documents were weakly aligned (1-4 cross references). Only one document did not to cite the other FRM policy documents. In the document cluster where flooding secondary to its main purpose five documents were closely aligned to the FRM policy documents, citing 5 or more sources. Seven documents were weakly aligned, citing 1-3 sources and five had not links to FRM policy documents. Of the third cluster documents only one had 5No cross references to other FRM policy documents, six had 1 to 3 references and the remaining 14 had no links.

When analysing the policy documents a judgement was made as to the main policy area in which the policies would be implements. The policy areas were classified as Civil Contingency Planning (CC), Development Planning (DEV), Environmental Planning (ENV) and Documents that cut across all policy Networks (ALL) (Table A1.4). Overall 10No documents were classed as CC, 10No as DEV, 14No as ENV and 17No as ALL. When cross referenced with the analysis of how central the issue of flooding was within each policy document, the policy network classification system revealed that development planning policies were most numerous documents amongst those that had a strong focus on flooding issues (Table A1.5).

As this thesis was mostly interested in community-institution links, the 60 policy documents were analysed to reveal links between FRM institutions. In total 99No different institutions were identified within the documents (Table A1.6) with a total of 345 links (Table A1.7). Table A1.7 also shows that 19No institutions had strong connections to 10% or more of the FRM policy documents. 15No had moderate connections to between 5 and 10% of FRM policy documents. 54No had weak connections (less than 5%) and 11No had no discernible connection to FRM policy documents (Table A1.8). In contrast to the finding above that Development planning documents were numerous in referring to flooding issues, when viewed from the perspective of institutional connectedness, the civil contingency planning network was revealed as being most highly connected to the institutions identified. The links between institutions were summarised and entered into the NodeXL spreadsheet to create the FRM Framework sociogram (Table A1.9 and Table A1.10). The policy documents were also analysed based on the strength of their links to the institutions.

**Table A1.1 Documents Reviewed for Thesis (Author)**

Policy ID	Level	Author	Date of Publication	Policy doc title	Reviewed
1	1	EA	2007	High level target 5: Development and Flood Risk in England	Y
2	1	DCLG	2006	Planning Policy Statement 25: Development and Flood Risk	Y
3	1	HMG	2011	Localism Act	Y
4	1	DEFRA	2005	Making space for water	Y
5	1	Foresight	2004	Foresight Future Flooding Report - Executive Summary	Y
6	1	DEFRA	2005	Sustainable Development Strategy, Securing the Future (ref p12)	Y
7	6	Too site specific		Flood Risk Assessments (site specific)	N
8	6	Too site specific		Standard Planning Application Form	N
9	1	DEFRA	N/A	Flood Management Stakeholders Forum	Y
10	1	DEFRA	2004	Delivering the essentials of life	Y
11	3	EA	2012	Catchment Flood Management Plans	Y
12	2	SDADCAG	2008	Shoreline Management Plans	Y
13	2	EA	2015	River Basin Management Plans	N
14	0	EU	2000	Water Framework Directive	N
15	1	Numerous	Theory	Integrated Coastal Zone Management	N
16	1	EFRAC	2004	Committee report on climate change, water security and flooding	Y
17	1	EA		Flood probability Maps	N
18	1	Numerous	Theory	SPRC modelling	N
19	1	EA	Theory	Warning and informing systems	N
20	4	TDC	2007	Strategic Flood Risk Assessment	Y
21	2	Revoked 2010		Regional Spatial Strategy	N
22	4	TDC	2006	Teignbridge Local Development Framework	Y
23	1	ODPM	2010	Building Regulations, Part C	Y

Table A1.1 Documents Reviewed for Thesis (Author) cont'd

Policy ID	Level	Author	Date of Publication	Policy doc title	Reviewed
24	1	DCLG	2006	Code for Sustainable Buildings	Y
25	2	Not found for Devon		Water Level Management Plans	N
26	1	DEFRA	2008	Environmental Stewardship Scheme	Y
27	1	HA	2009	Design Manual for roads and bridges, HD45/09	Y
28	1	DfT	2007	Manual for Streets	Y
29	1	IHT	Theory	Delivering Best Value in Highways Maintenance	N
30	1	DEFRA	2004	Groundwater Flooding Scoping Study	Y
31	1	HMG	1949	Coast Protection Act	Y
32	1	ODPM	Theory	Home Information Packs	N
33	2	LRF	2013	Multi Agency Flood Risk Civil Contingency Plan	Y
34	1	HMG	1995	Environment Act	Y
35	1	HMG	1991	Land Drainage Act	Y
36	1	CIRIA	Theory	Sustainable Urban Drainage Systems (SUDS)	N
37	0	UN	1997	Kyoto Protocol	N
38	0	UN	1992	UN Framework Convention on Climate Change	N
39	1	DEFRA	2005	Climate Change Communications Initiative	Y
40	0	UN	2000	Millennium Development Goals	N
41	1	DEFRA	Theory	UK Climate Impacts Programme (UKCIP)	N
42	1	HMG	2005	Clean Neighbourhoods and Environment Act	Y
43	1	HMG	1991	Water Resources Act	Y
44	1	HMG	1989	Water Act	Y
45	1	HMG	1991	Water Industry Act	Y
46	1	HMG	1990	Environmental Protection Act	Y

Table A1.1 Documents Reviewed for Thesis (Author) cont'd

Policy ID	Level	Author	Date of Publication	Policy doc title	Reviewed
47	1	HMG	1962	Transport Act	Y
48	1	WRc	Theory	Sewers for adoption	N
49	1	DEFRA	2007	Rural Development Programme for England (2007- 2013)	Y
50	1	BRE	Theory	BREEAM	N
51	0	EU	2006	Groundwater Directive	N
52	1	HA	Theory	Highway Agency Water Risk Assessment Tool (HAWRAT)	N
53	1	HMG	1975	Reservoir Act	Y
54	1	BSI	Theory	British Standards	N
55	1	OPDM	2002	Preparing for Floods	Y
56	1	ODPM	2005	PPS 1 Delivering Sustainable Development	Y
57	1	DCLG	2012	National Planning Policy Framework	Y
58	2	RPB	2007	SW Regional Flood Risk Appraisal (RFRA)	Y
59	1	HMG	2006	Town & Country Planning (General Dev. Procedure) Order No. 1062	Y
60	1	HMG	2007	Town & Country Planning (General Dev. Procedure) Order No2375	Y
61	1	HMG	1990	Town & Country Planning Act	Y
62	1	HMG	2004	Civil Contingency Act	Y
63	1	HMG	2006	Natural Environment and Rural Communities Act 2006	Y
64	1	HMG	2009	Marine and Coastal Access Act 2009	Y
65	1	HMG	2004	Planning and Compulsory Purchase Act	Y
66	1	HMG	2010	Flood and Water Management Act	Y
67	1	HMG	2000	Local Government Act	Y
68	1	HMG	2007	Local Government + Public Involvement in Health Act	Y
69	1	HMG	1995	Town & Country Planning (General Dev Procedure) Order No419	Y

Table A1.1 Documents Reviewed for Thesis (Author) cont'd

Policy ID	Level	Author	Date of Publication	Policy doc title	Reviewed
70	1	HMG	2009	Flood Risk Regulations 2009	Y
71	1	HMG	1995	Local Government Finance Act 2012	Y
72	1	HMG	1936	Public Health Act 1936	Y
73	1	HMG	1984	Building Act 1984	Y
74	1	HMG	2008	Planning Act 2008	Y
75	1	EA	2011	National Flood and Coastal Erosion Risk Management Strategy	Y
76	4	Not found for Devon	2015	Local Flood and Coastal Erosion Risk Management Strategy	N
77	1	HMG	1980	Highway Act 1980	Y
78	1	HMG	1995	Merchant Shipping Act 1995	Y
79	1	HMG	1979	Ancient Monuments and Archaeological Areas Act 1979	Y
80	1	Not found for Devon	2011	Preliminary Flood Risk Assessment Maps	N
81	3	DCC	2011	Preliminary Flood Risk Assessment Reports	Y
82	1	Not found for Devon	2013	Flood Hazard Maps	N
83	1	Not found for Devon	2013	Flood Risk Maps	N
84	1	Not found for Devon	2015	Flood Risk Management Plans	N
85	1	DTLR	2001	Planning: delivering a fundamental change, 2001	Y
86	1	HMG	2008	Climate Change Act 2008	Y
87	2	HMG	2011	Marine Policy Statement	Y
88	2	Not found for Devon		Coastal Change Management Area	N
89	0	EU	2007	Flood Directive	N

**Table A1.2 Centrality of flooding issues in document (Author)**

Doc Count	Policy ID	Refs to flooding	Pages	Refs per page (R)	R>0.5	0.5>R>0	R=0
					Flooding a central issue in the document	Flooding a secondary issue in the document	Flooding not mentioned in document
1	1	290	37	7.84	X		
2	2	478	50	9.56	X		
3	3	12	497	0.02		X	
4	4	312	45	6.93	X		
5	5	299	59	5.07	X		
6	6	30	188	0.16		X	
7	9	0	-	-			X
8	10	34	91	0.37		X	
9	11	330	32	10.31	X		
10	12	0	-	-			X
11	16	947	181	5.23	X		
12	20	300	120	2.50	X		
13	22	100	139	0.72	X		
14	23	41	56	0.73	X		
15	24	8	31	0.26		X	
16	26	28	167	0.17		X	
17	27	372	129	2.88	X		
18	28	19	146	0.13		X	
19	30	671	85	7.89	X		
20	31	0	-	-			X
21	33	578	79	7.32	X		
22	34	23	40	0.58	X		
23	35	0	-	-			X
24	39	0	-	-			X
25	42	0	-	-			X
26	43	32	31	1.03	X		
27	44	6	23	0.26		X	
28	45	1	33	0.03		X	
29	46	0	-	-			X
30	47	0	-	-			X
31	49	48	1151	0.04		X	
32	53	0	-	-			X
33	55	978	100	9.78	X		
34	56	3	25	0.12		X	
35	57	49	65	0.75	X		
36	58	609	53	11.49	X		
37	59	0	-	-			X
38	60	11	4	2.75	X		
39	61	0	-	-			X
40	62	0	-	-			X
41	63	0	-	-			X
42	64	6	347	0.02		X	
43	65	0					X
44	66	388	84	4.62	X		
45	67	0	-	-			X
46	68	0	-	-			X
47	69	0	-	-			X
48	70	242	16	15.13	X		
49	71	0	-	-			
50	72	1	247	0.00		X	
51	73	0	-	-			X
52	74	3	204	0.01		X	
53	75	598	63	9.49	X		
54	77	5	375	0.01		X	
55	78	0	-	-			X
56	79	5	79	0.06		X	
57	81	603	42	14.36	X		
58	85	1	18	0.06		X	
59	86	0	-	-			X
60	87	22	51	0.43		X	

**Table A1.3 Strength of links to FRM policy documents (Author)**

Doc Count	Policy ID	References to other policy documents (N)	N>5	5>N>1	N=0
			Strong alignment to FRM Policy	Weak alignment to FRM policy	No alignment to FRM policy
1	1	12	X		
2	2	27	X		
3	3	3		X	
4	4	33	X		
5	5	0			X
6	6	12	X		
7	9	0			X
8	10	6	X		
9	11	3		X	
10	12	0			X
11	16	1		X	
12	20	8	X		
13	22	8	X		
14	23	3		X	
15	24	3		X	
16	26	1		X	
17	27	14	X		
18	28	7	X		
19	30	4		X	
20	31	3		X	
21	33	1		X	
22	34	5	X		
23	35	0			X
24	39	0			X
25	42	0			X
26	43	5	X		
27	44	2		X	
28	45	5	X		
29	46	1		X	
30	47	1		X	
31	49	1		X	
32	53	1		X	
33	55	2		X	
34	56	0			X
35	57	9	X		
36	58	6	X		
37	59	0			X
38	60	2		X	
39	61	3		X	
40	62	5	X		
41	63	1		X	
42	64	1		X	
43	65	0			X
44	66	14	X		
45	67	0			X
46	68	0			X
47	69	0			X
48	70	11	X		
49	71	0			X
50	72	0			X
51	73	0			X
52	74	2		X	
53	75	17	X		
54	77	0			X
55	78	0			X
56	79	0			X
57	81	11	X		
58	85	0			X
59	86	0			X
60	87	8	X		

**Table A1.4 Document classification based on policy network (Author)**

Doc Count	Policy ID	Civil Contingency Planning (CC)	Development Planning (DEV)	Environmental Planning (ENV)	All Planning Networks (ALL)
1	1		X		
2	2		X		
3	3				X
4	4		X		
5	5				X
6	6			X	
7	9	X			
8	10			X	
9	11			X	
10	12			X	
11	16		X		
12	20				X
13	22		X		
14	23		X		
15	24			X	
16	26			X	
17	27		X		
18	28		X		
19	30	X			
20	31			X	
21	33	X			
22	34			X	
23	35	X			
24	39			X	
25	42			X	
26	43	X			
27	44	X			
28	45	X			
29	46			X	
30	47		X		
31	49				X
32	53	X			
33	55				X
34	56			X	
35	57				X
36	58				X
37	59		X		
38	60		X		
39	61		X		
40	62	X			
41	63			X	
42	64		X		
43	65		X		
44	66				X
45	67				X
46	68				X
47	69		X		
48	70				X
49	71				X
50	72				X
51	73		X		
52	74		X		
53	75				X
54	77		X		
55	78	X			
56	79		X		
57	81				X
58	85				X
59	86			X	
60	87				X

**Table A1.5 Crosstab of Policy Network with Alignment to FRM Policy (Author)**

	N>5	5>N>1	N=0	
Policy Network	Strong alignment to FRM Policy	Weak alignment to FRM policy	No alignment to FRM policy	<b>Total</b>
Civil Contingeny Planning (CC)	3	2	5	<b>10</b>
Development Planning (DEV)	8	5	6	<b>19</b>
Environmental Planning (ENV)	2	5	7	<b>14</b>
All Planning Networks (ALL)	9	5	3	<b>17</b>
<b>Total</b>	<b>22</b>	<b>17</b>	<b>21</b>	<b>60</b>

**Table A1.6 Institutions identified in policy documents (Author)**

No.	Acronym	Name	Level of operation
1	ABI	Association of British Insurers	1
2	ADA	Association of Drainage Authorities	1
3	AHVLA	Animal Health and Veterinary Lab Agency	1
4	BDMA	British Damage Management Association	1
5	BGS	British Geological Survey	1
6	BR	British Rail	1
7	BRE	Building Research Establishment	1
8	BSI	British Standards Institute	1
9	BW	British waterways	1
10	CABE	Commission for Architecture and the Built Env	1
11	CC	Coastal Chairs	2
12	CIOB	Chartered Institute of Building	1
13	CIRIA	CIRIA	1
14	CLBA	Country Land & Business Association	1
15	CN	CoastNet	1
16	Community	Community	5
17	CPA	Coastal Protection Authority	1
18	D&CC	Devon and Cornwall Constabulary	2
19	DCC	Devon County Council	3
20	DCLG	Department for Communities and Local Government	1
21	DEFRA	Department for Environment Food and Rural Affairs	1
22	DFiD	Department for International Development	1
23	DfT	Department for Transport	1

Table A1.6 Institutions identified in policy documents (Author) cont'd

No.	Acronym	Name	Level of operation
24	DSFRS	Devon and Somerset Fire and Rescue Service	2
25	EA	Environment Agency	1
26	EFRAC	Env Food and Rural Affairs Committee	1
27	EH	English Heritage	1
28	Em SERV	Emergency Services	2
29	FC	Forestry Commission	1
30	FMSF	Flood Management Stakeholders Forum	1
31	FPA	Flood Products Association	1
32	FS	Foresight	1
33	FUTERRA	Climate Change Communications Working Group	1
34	GDS	Government Decontamination Service	1
35	HA	Highways Agency	1
36	HBF	House Builders Federation	1
37	HBMCE	Historic Buildings and Monuments Commission for England	1
38	HMG	Her Majesty's Government	1
39	HMT	HM treasury	1
40	HPA	Health Protection Agency	1
41	HSE	Health and Safety Executive	1
42	ICE	Institution of Civil Engineers	1
43	IDB	Internal Drainage Boards	2
44	IHT	Institution of Highways and Transportation	1
45	LA	Local Authority	3
46	LCAP	Local Community Action Partnerships	4

**Table A1.6 Institutions identified in policy documents (Author) cont'd**

No.	Acronym	Name	Level of operation
47	LDA	Land Drainage Authority	3
48	LFDC	Local Flood Defence Committee	4
49	LGA	Local Government Association	1
50	LHA	Local Harbour Authority	5
51	LLFRA	Lead Local Flood Risk Authority	3
52	LPA	Local Planning Authority	3
53	LRF	Local resilience forum	2
54	MCA	Coast Guard and Maritime Agency	1
55	MO	Met Office	1
56	MoD	Ministry of Defence	1
57	NA	Newton Abbot (study community)	5
58	NABW	Newton Abbot Bushell Ward	5
59	NATC	Newton Abbot Town Council	5
60	NCCE	Nature Conservancy Council for England	1
61	NE	Natural England	1
62	NFF	National Flood Forum	1
63	NFT	NHS Foundation Trust	1
64	NFU	National Farmers Union	1
65	NHBC	National Home Builders Council	1
66	NHS	National Health Service	1
67	NKDT	Newton Abbot and Kingsteignton Devon Town	4
68	NPA	National Parks Authority	2
69	NVCC	National Voice of Coastal Communities	1

**Table A1.6 Institutions identified in policy documents (Author) cont'd**

No.	Acronym	Name	Level of operation
70	ODPM	Office for the Deputy Prime Minister	1
71	OFWAT	OFWAT	1
72	ONS	Office of National Statistics	1
73	OSCFRM	Overview and Scrutiny Committee: FRM	1
74	OWNER/DEV	Owner/Developer	6
75	PCT	Primary Care Trust	4
76	RAC	Rivers Advisory Committees	2
77	RDA	Regional Development Agency	2
78	RFCC	Regional Flood and Coastal Committee	2
79	RFDC	Regional Flood Defence Committees	2
80	RICS	Royal Institute of Chartered Surveyors	1
81	RPB	Regional Planning Body	2
82	RRF	Regional Resilience forum	2
83	RRT	Regional Resilience Team	2
84	SDADCAG	South Devon and Dorset Coastal Authorities Group	2
85	SDSAB	Sustainable Drainage System Approving Body	3
86	SH	Shaldon (study community)	5
87	SHA	Strategic Health Authority	2
88	SPC	Shaldon Parish Council	5
89	SSW	Shaldon and Stokeinteignton Ward	5
90	SWLRF	South West Local Resilience Forum	2
91	TDC	Teignbridge District Council	4
92	TEP	Teign Estuary Partnership	4

**Table A1.6 Institutions identified in policy documents (Author) cont'd**

No.	Acronym	Name	Level of operation
93	TEW	Teignmouth East Ward	5
94	TM	Teignmouth (study community)	5
95	TTC	Teignmouth Town Council	5
96	UKCIP	UK Climate Impact Panel	1
97	UT	Utilities	1
98	WALL	HR Wallingford	1
99	WCs	Water Companies	1

**Table A1.7 Policy documents with links to FRM institutions (Author)**

Policy ID	Author	Links to FRM institutions (L)	L>10	10>L>5	5>L>1	L=0
			Strongly connected to FRM institutions	Moderately connected to FRM institutions	Weakly connected to FRM institutions	Not connected to FRM institutions
1	EA	5		X		
2	DCLG	15	X			
3	HMG	3			X	
4	DEFRA	21	X			
5	Foresight	3			X	
6	DEFRA	2			X	
9	DEFRA	20	X			
10	DEFRA	4			X	
11	EA	12	X			
12	SDADCAG	0				X
16	EFRAC	7		X		
20	TDC	9		X		
22	TDC	2			X	
23	ODPM	4			X	
24	ODPM	5		X		
26	DEFRA	1			X	
27	HA	4			X	
28	DfT	4			X	
30	DEFRA	10	X			
31	HMG	7		X		
33	LRF	33	X			
34	HMG	3			X	
35	HMG	4			X	
39	DEFRA	1			X	
42	HMG	1			X	
43	HMG	13	X			
44	HMG	8		X		
45	HMG	9		X		
46	HMG	3			X	
47	HMG	4			X	
49	DEFRA	4			X	
53	HMG	4			X	
55	ODPM	16	X			
56	DCLG	1			X	
57	DCLG	0				X
58	RPB	3			X	
59	HMG	0				X
60	HMG	1			X	
61	HMG	8		X		
62	HMG	16	X			
63	HMG	0				X
64	HMG	3			X	
65	HMG	0				X
66	HMG	9		X		
67	HMG	0				X
68	HMG	0				X
69	HMG	0				X
70	HMG	9		X		
71	HMG	0				X
72	HMG	3			X	
73	HMG	0				X
74	HMG	1			X	
75	EA	24	X			
77	HMG	1			X	
78	HMG	0				X
79	HMG	1			X	
81	DCC	17	X			
85	DfT	6		X		
86	HMG	0				X
87	HMG	1			X	
<b>Total</b>		<b>345</b>				

Table A1.8 FRM Institutions with links to policy documents (Author)

No.	Acronym	Number of links from policy documents (PL)	PL>6 Strongly connected to FRM policy	6>PL>3 Moderately connected to FRM policy	3>PL>1 Weakly connected to FRM policy	PL=0 Not connected to FRM policy
1	ABI	8	X			
2	ADA	2			X	
3	AHVLA	1			X	
4	BDMA	2			X	
5	BGS	1			X	
6	BR	6	X			
7	BRE	4		X		
8	BSI	1			X	
9	BW	5		X		
10	CABE	1			X	
11	CC	1			X	
12	CIOB	1			X	
13	CIRIA	8	X			
14	CLBA	1			X	
15	CN	1			X	
16	Community	7	X			
17	CPA	1			X	
18	D&CC	1			X	
19	DCC	1			X	
20	DCLG	2			X	
21	DEFRA	10	X			

Table A1.8 FRM Institutions with links to policy documents (Author) cont'd

No.	Acronym	Number of links from policy documents (PL)	PL>6 Strongly connected to FRM policy	6>PL>3 Moderately connected to FRM policy	3>PL>1 Weakly connected to FRM policy	PL=0 Not connected to FRM policy
22	DFiD	1			X	
23	DfT	4		X		
24	DSFRS	2			X	
25	EA	32	X			
26	EFRAC	0				X
27	EH	2			X	
28	Em SERV	3			X	
29	FC	2			X	
30	FMSF	3			X	
31	FPA	2			X	
32	FS	1			X	
33	FUTERRA	1			X	
34	GDS	1			X	
35	HA	10	X			
36	HBF	1			X	
37	HBMCE	1			X	
38	HMG	7	X			
39	HMT	2			X	
40	HPA	2			X	
41	HSE	1			X	

Table A1.8 FRM Institutions with links to policy documents (Author) cont'd

No.	Acronym	Number of links from policy documents (PL)	PL>6 Strongly connected to FRM policy	6>PL>3 Moderately connected to FRM policy	3>PL>1 Weakly connected to FRM policy	PL=0 Not connected to FRM policy
42	ICE	8	X			
43	IDB	14	X			
44	IHT	1			X	
45	LA	20	X			
46	LCAP	1			X	
47	LDA	1			X	
48	LFDC	2			X	
49	LGA	4		X		
50	LHA	9	X			
51	LLFRA	8	X			
52	LPA	11	X			
53	LRF	4		X		
54	MCA	1			X	
55	MO	4		X		
56	MoD	2			X	
57	NA	4		X		
58	NABW	0				X
59	NATC	0				X
60	NCCE	2			X	
61	NE	13	X			

Table A1.8 FRM Institutions with links to policy documents (Author) cont'd

No.	Acronym	Number of links from policy documents (PL)	PL>6 Strongly connected to FRM policy	6>PL>3 Moderately connected to FRM policy	3>PL>1 Weakly connected to FRM policy	PL=0 Not connected to FRM policy
62	NFF	4		X		
63	NFT	1			X	
64	NFU	3		X		
65	NHBC	3		X		
66	NHS	2			X	
67	NKDT	0				X
68	NPA	7	X			
69	NVCC	2			X	
70	ODPM	2			X	
71	OFWAT	4		X		
72	ONS	0				X
73	OSCFRM	1			X	
74	OWNER/DEV	1			X	
75	PCT	2			X	
76	RAC	1			X	
77	RDA	1			X	
78	RFCC	2			X	
79	RFDC	8	X			
80	RICS	1			X	
81	RPB	1			X	

Table A1.8 FRM Institutions with links to policy documents (Author) cont'd

No.	Acronym	Number of links from policy documents (PL)	PL>6 Strongly connected to FRM policy	6>PL>3 Moderately connected to FRM policy	3>PL>1 Weakly connected to FRM policy	PL=0 Not connected to FRM policy
82	RRF	3		X		
83	RRT	1			X	
84	SDADCAG	0				X
85	SDSAB	2			X	
86	SH	4		X		
87	SHA	2			X	
88	SPC	0				X
89	SSW	0				X
90	SWLRF	0				X
91	TDC	1			X	
92	TEP	2			X	
93	TEW	0				X
94	TM	4		X		
95	TTC	0				X
96	UKCIP	3		X		
97	UT	6	X			
98	WALL	2			X	
99	WCs	17	X			
<b>Total</b>		<b>345</b>	<b>19</b>	<b>15</b>	<b>54</b>	<b>11</b>

Table A1.9 NodeXL vertex data for FMR Framework sociogram (Author)

Vertex	Label	Vertex	Label
1	ADA	54	RRF
2	AHVLA	55	RRT
5	CC	56	SPC
6	CIOB	62	TDC
7	CLBA	64	TTC
8	MCA	67	WCs
9	CN	68	DfID
10	D&CC	69	ICE
11	DCC	70	CABE
12	DCLG	71	UKCIP
13	DEFRA	72	FUTERRA
14	DfT	73	LA
15	DSFRS	74	BW
16	EA	75	BR
17	EH	76	LHA
19	FC	77	BGS
20	FMSF	78	BRE
21	FPA	79	WALL
23	GDS	80	CIRIA
24	HA	81	EFrac
25	HMG	82	BSI
26	HMT	83	RPB
27	HPA	84	OWNER/DEV
28	HSE	85	Em SERV
29	IDB	86	Community
30	IHT	87	RAC
31	ABI	88	LFDC
32	LCAP	90	NCCE
33	LGA	91	NPA
34	LPA	92	NHS
35	LRF	93	SHA
36	MO	97	NFT
37	MoD	98	LLFRA
38	NATC	99	OSCFRM
41	NE	100	CPA
42	NFF	101	RFCC
43	NFU	102	HBMCE
44	NHBC	103	LDA
46	NVCC	104	FS
47	ODPM	105	BDMA
48	OfWAT	106	HBF
50	PCT	107	SDSAB
51	RDA	109	TEP
52	RFDC	110	UT
53	RICS		

Table A1.10 Edge data for NodeXL FRM Framework sociogram (Author)

Link	Vertex 1	Vertex 2
1	25	73
2	12	34
3	25	86
4	25	24
5	25	73
6	11	16
7	13	72
8	25	70
9	83	16
10	83	13
11	83	34
12	12	16
13	104	13
14	104	69
15	25	73
16	25	69
17	25	103
18	12	13
19	25	41
20	25	101
21	25	73
22	25	41
23	25	99
24	25	73
25	25	41
26	25	90
27	13	16
28	13	71
29	13	16
30	13	41
31	13	25
32	13	19
33	13	16
34	25	73
35	25	67
36	25	69
37	25	76
38	25	86
39	25	86
40	25	74

Link	Vertex 1	Vertex 2
41	47	16
42	47	80
43	47	78
44	47	82
45	13	16
46	24	29
47	24	80
48	24	74
49	13	14
50	25	73
51	25	52
52	13	12
53	13	16
54	16	34
55	13	25
56	13	14
57	47	16
58	47	67
59	47	80
60	47	78
61	47	44
62	13	35
63	14	67
64	14	16
65	14	80
66	14	13
67	25	73
68	25	29
69	25	52
70	14	16
71	13	71
72	13	47
73	13	68
74	16	13
75	14	29
76	14	25
77	14	34
78	14	98
79	14	107
80	16	25

Table A1.10 Edge data for NodeXL FRM Framework sociogram (Author) cont'd

Link	Vertex 1	Vertex 2	Link	Vertex 1	Vertex 2
81	25	73	121	25	67
82	25	67	122	25	29
83	25	34	123	25	41
84	25	76	124	25	24
85	25	86	125	25	76
86	25	91	126	25	98
87	25	110	127	25	102
88	16	14	128	16	13
89	25	67	129	25	73
90	25	29	130	25	67
91	25	76	131	25	29
92	25	52	132	25	24
93	25	91	133	25	98
94	25	74	134	25	48
95	25	88	135	25	101
96	16	12	136	25	100
97	25	73	137	16	25
98	16	24	138	25	73
99	25	29	139	25	67
100	25	76	140	25	29
101	25	75	141	25	41
102	25	74	142	25	76
103	81	16	143	25	86
104	81	67	144	25	91
105	81	13	145	25	110
106	81	31	146	16	24
107	81	69	147	13	73
108	81	36	148	13	67
109	81	48	149	13	29
110	62	16	150	13	31
111	62	25	151	13	69
112	62	34	152	13	80
113	62	80	153	13	78
114	62	91	154	13	79
115	62	38	155	13	77
116	62	56	156	16	73
117	62	64	157	16	67
118	62	109	158	16	29
119	16	11	159	16	41
120	25	73	160	16	34

Table A1.10 Edge data for NodeXL FRM Framework sociogram (Author) cont'd

Link	Vertex 1	Vertex 2
161	16	35
162	16	98
163	16	38
164	16	56
165	16	64
166	16	109
167	16	104
168	24	16
169	25	73
170	25	67
171	25	41
172	25	76
173	25	52
174	25	69
175	25	91
176	25	110
177	25	74
178	25	88
179	25	90
180	25	87
181	25	16
182	12	73
183	12	67
184	25	16
185	12	29
186	12	34
187	12	24
188	12	31
189	12	86
190	12	33
191	12	35
192	12	71
193	12	85
194	12	83
195	12	84
196	47	16
197	47	73
198	47	41
199	47	31
200	47	69

Link	Vertex 1	Vertex 2
201	47	80
202	47	98
203	47	14
204	47	33
205	47	42
206	47	78
207	47	44
208	47	21
209	47	79
210	47	105
211	47	106
212	25	16
213	25	73
214	25	67
215	25	24
216	25	76
217	25	86
218	25	75
219	25	110
220	25	16
221	25	85
222	25	27
223	25	50
224	25	92
225	25	93
226	25	28
227	25	97
228	25	16
229	11	67
230	11	13
231	11	29
232	11	41
233	11	34
234	11	76
235	11	52
236	11	98
237	11	91
238	11	75
239	11	38
240	11	56

Table A1.10 Edge data for NodeXL FRM Framework sociogram (Author) cont'd

Link	Vertex 1	Vertex 2
241	11	64
242	11	15
243	11	107
244	11	62
245	13	41
246	13	24
247	13	31
248	25	16
249	13	33
250	13	42
251	13	48
252	13	20
253	13	43
254	13	44
255	13	1
256	25	16
257	13	17
258	13	19
259	13	21
260	13	26
261	13	46
262	13	5
263	13	7
264	13	9
265	25	16
266	13	67
267	13	29
268	13	41
269	25	13
270	13	34
271	13	24
272	13	31
273	13	52
274	25	16
275	25	16
276	13	36
277	13	48
278	13	54
279	13	47
280	13	6

Link	Vertex 1	Vertex 2
281	13	30
282	13	32
283	13	51
284	13	53
285	13	55
286	25	16
287	16	29
288	16	41
289	25	16
290	25	16
291	16	31
292	16	52
293	16	69
294	16	98
295	16	75
296	16	110
297	16	33
298	25	35
299	16	36
300	16	42
301	16	20
302	16	43
303	16	54
304	16	1
305	16	17
306	16	26
307	16	37
308	16	46
309	35	16
310	35	13
311	35	73
312	35	67
313	35	25
314	104	16
315	35	24
316	35	31
317	35	52
318	35	80
319	35	86
320	35	91

**Table A1.10 Edge data for NodeXL FRM Framework sociogram (Author) cont'd**

Link	Vertex 1	Vertex 2
321	35	75
322	35	110
323	35	36
324	35	38
325	35	42
326	35	56
327	35	64
328	35	20
329	35	43
330	35	54
331	35	85
332	35	15
333	35	27
334	35	37
335	35	50
336	35	92
337	35	93
338	35	105
339	35	2
340	35	8
341	35	10
342	35	23

**Appendix II – Observation Data**

## Outline of Appendix II

This appendix contains data gathered from observational studies in the three case study communities. The data was processed in five stages to facilitate further data gathering using a questionnaire survey.

The first stage in the observational research exercise was to gather evidence of the existence of a flood risk community within the case study areas. In this appendix data from this stage is presented in the form of a series of photographs showing features of the cases study communities and, when possible, examples of flood risk and protective measures taken by community residents against the threat of flooding (Tables A2.1-2.3).

The second stage involved the identification of the boundary to the flood risk community. The boundary location was defined using flood risk maps and local evidence collected from informal discussions with community residents (Figures A2.1-2.3).

In the third stage the Author applied the principles of a Source, Pathway, Receptor, Consequence (SPRC) method to begin the process of sub-dividing the communities into sub-areas. In stage three the pathways that flood waters would take through the communities were mapped (Figures A2.4-2.6). Stages four and five involved a further breakdown of the broad sub-divisions created by the flood pathway mapping exercise, based on the major land use classification in each sub-area (Figures A2.7-2.12 and Table A2.1-2.3).

**Stage 1 – Observational visit to gather visual evidence of flood risk communities**

**Table A2.1 Images from Newton Abbot observational visit on 27/08/10 (Author)**

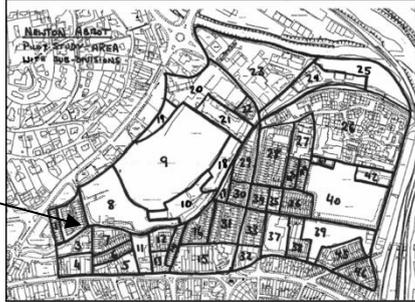
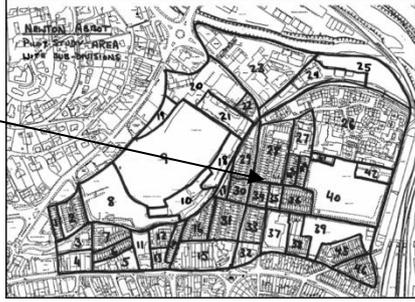
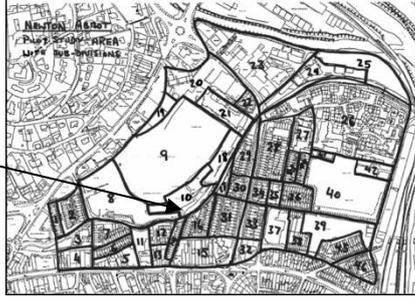
	<p>Flood hazard in case study area</p> 
	<p>Evidence of flood board</p> 
	<p>Development on back of tidal river</p> 

Table A2.1 Images from Newton Abbot observational visit on 27/08/10 (Author) cont'd

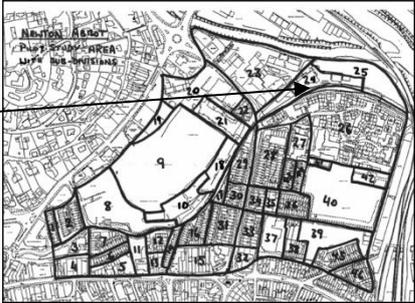
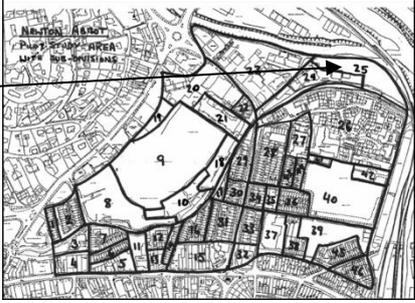
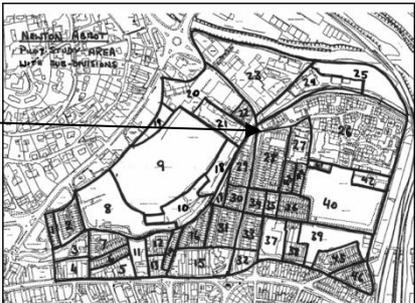
	<p>Pumping station on tidal river</p> 
	<p>Residential area adjacent to tidal river</p> 
	<p>Industrial units in flood area</p> 

Table A2.1 Images from Newton Abbot observational visit on 27/08/10 (Author) cont'd

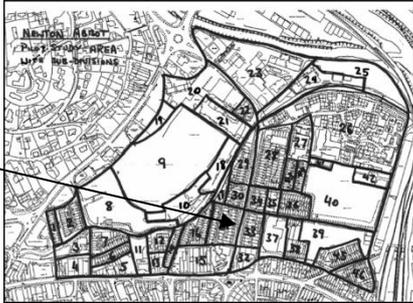
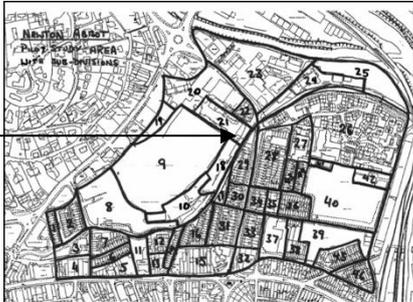
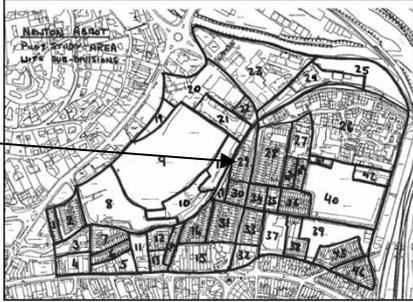
	<p>Main road through flood risk area</p> 
	<p>Bridge over tidal river</p> 
	<p>Residential units adjacent to flood hazard</p> 

Table A2.2 Images from Teignmouth observational visit on 19/07/10 (Author)

	<p>Commercial properties on beach front</p> 
	<p>Pub adjacent to beach</p> 
	<p>Homes adjacent to beach</p> 

Table A2.2 Images from Teignmouth observational visit on 19/07/10 (Author) cont'd

	<p>Flood protection ramp on beach</p> 
	<p>Flood board brackets on beach front properties</p> 
	<p>Flood board brackets on beach front properties</p> 

Table A2.2 Images from Teignmouth observational visit on 19/07/10 (Author) cont'd

	<p>Properties on beach front</p> 
	<p>Huts on beach</p> 
	<p>Views across to industrial area on front</p> 

Table A2.2 Images from Teignmouth observational visit on 19/07/10 (Author) cont'd

	<p>Flood board brackets on residential properties</p> 
	<p>Basement construction below flood water level</p> 
	<p>Flood board bracket on residential property</p> 

Table A2.2 Images from Teignmouth observational visit on 19/07/10 (Author) cont'd

 <p>A photograph showing a flood board bracket installed on a commercial property. The bracket is a metal L-shaped piece attached to the wall and floor. The floor is paved with light-colored bricks, and the wall is painted yellow with a red baseboard. A black and white checkered mat is visible near the entrance.</p>	<p>Flood board bracket on commercial property</p>  <p>A map of Teignmouth showing the location of the commercial property. An arrow points to a specific location on the town's waterfront, near the river and the harbor.</p>
 <p>A photograph showing a flood board bracket installed on a residential property. The bracket is a metal L-shaped piece attached to the wall and floor. The floor is paved with light-colored bricks, and the wall is white with a black baseboard. A red door is visible in the background.</p>	<p>Flood board bracket on residential property</p>  <p>A map of Teignmouth showing the location of the residential property. An arrow points to a specific location on the town's waterfront, near the river and the harbor.</p>
 <p>A photograph showing flood board brackets installed on a residential property. The brackets are metal L-shaped pieces attached to the wall and floor. The floor is paved with light-colored bricks, and the wall is white with a black baseboard. A yellow door is visible in the background.</p>	<p>Flood board brackets on residential property</p>  <p>A map of Teignmouth showing the location of the residential property. An arrow points to a specific location on the town's waterfront, near the river and the harbor.</p>

Table A2.2 Images from Teignmouth observational visit on 19/07/10 (Author) cont'd



Flood board bracket on commercial property



Flood board bracket on commercial property



Flood board bracket on residential property



Table A2.2 Images from Teignmouth observational visit on 19/07/10 (Author) cont'd

	<p>Flood board bracket on commercial properties</p> 
	<p>Flood board bracket on commercial property</p> 
	<p>Flood board bracket on commercial property</p> 

Table A2.2 Images from Teignmouth observational visit on 19/07/10 (Author) cont'd

	<p>Flood protection sea wall</p> 
	<p>Commercial properties behind sea wall</p> 
	<p>Sea wall looking towards Shaldon</p> 

Table A2.3 Images from Shaldon observational visit on 24/01/10 (Author)

	<p>House with flood board in place to front door</p> 
	<p>House with framework for flood board to front porch</p> 
	<p>House with framework for flood board to garden wall</p> 

Table A2.3 Images from Shaldon observational visit on 24/01/10 (Author) cont'd



Hose with framework for flood board on front door



House with solid wall flood defence in front gate to main entrance



House with low bund wall to side exposed to seafront

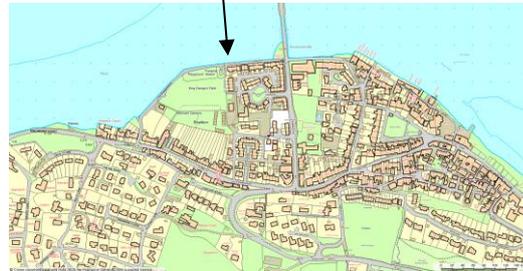


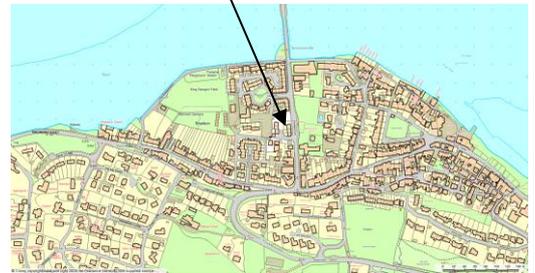
Table A2.3 Images from Shaldon observational visit on 24/01/10 (Author) cont'd



Commercial premises with low bund wall



Newly built homes with elevated ground floor



## Stage 2 - Defining the boundary of the case study areas

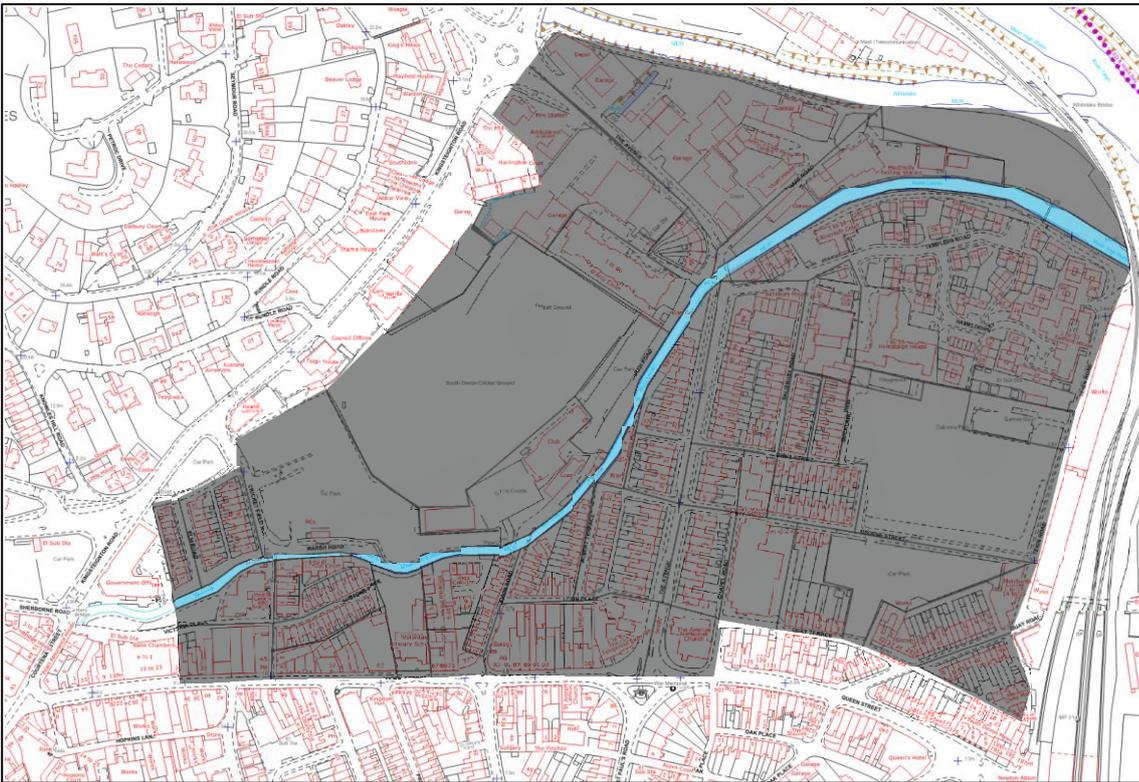
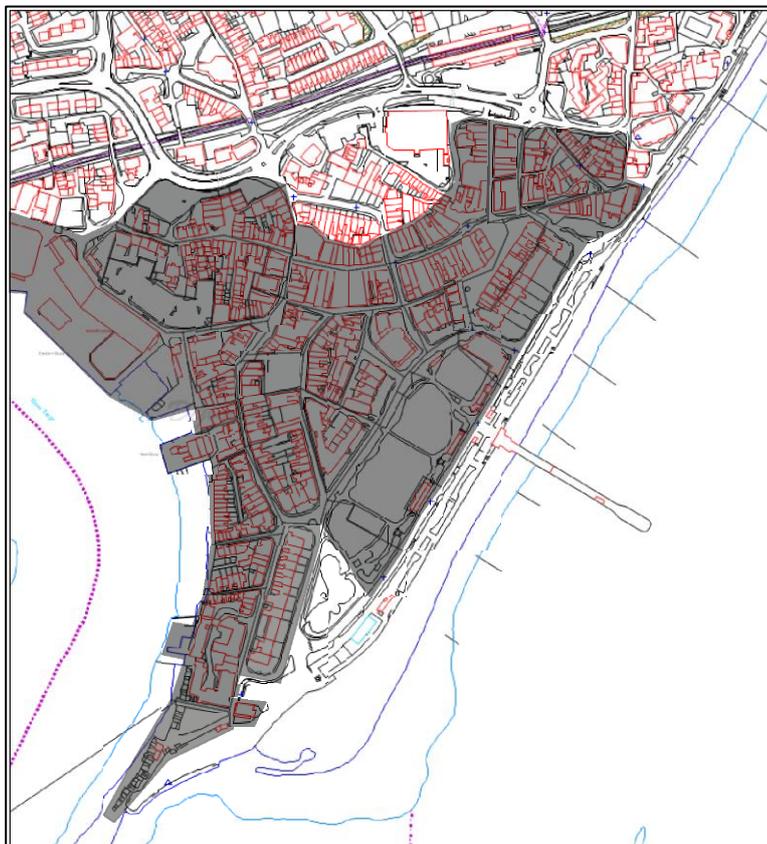


Figure A2.1 Newton Abbot Case Study Community Boundary (Author adapted from Digimap)

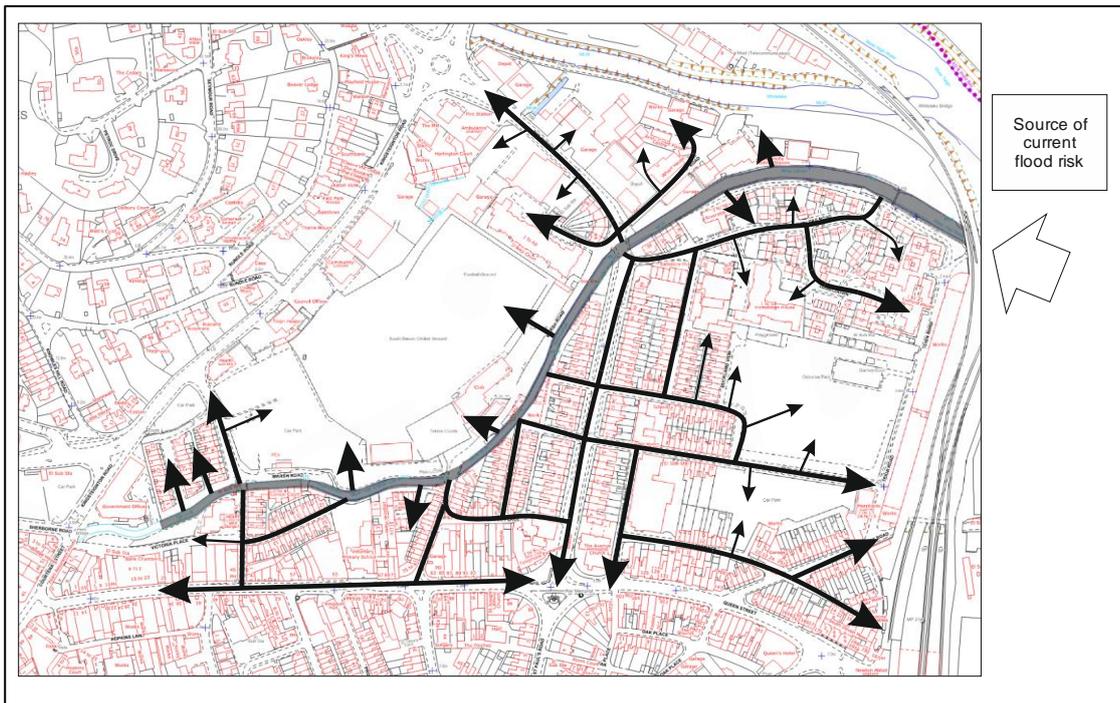


**Figure A2.2 Teignmouth Case Study Community Boundary (Author adapted from Digimap)**

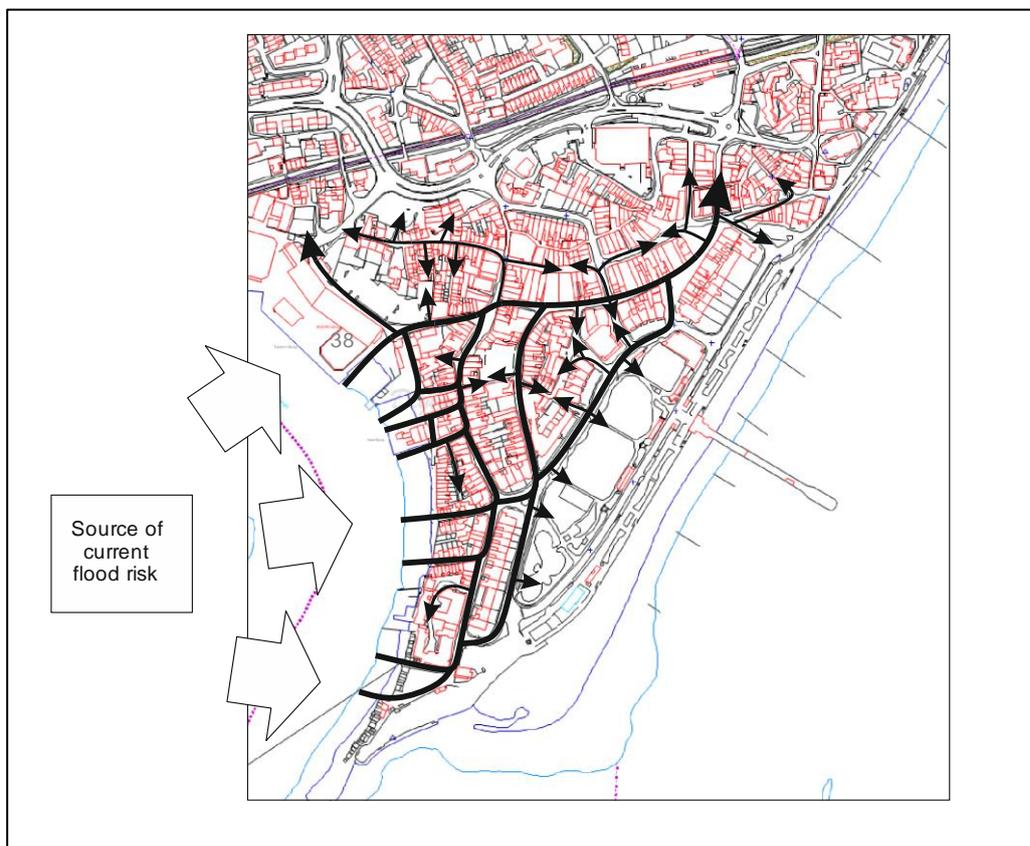


**Figure A2.3 Shaldon Case Study Community Boundary (Author adapted from Digimap)**

**Stage 3 - Dividing the case study areas based using the flood pathways**



**Figure A2. 4 Flood pathways through Newton Abbot case study area (Author adapted from Digimap)**



**Figure A2. 5 Flood pathways through Teignmouth case study area (Author adapted from Digimap)**

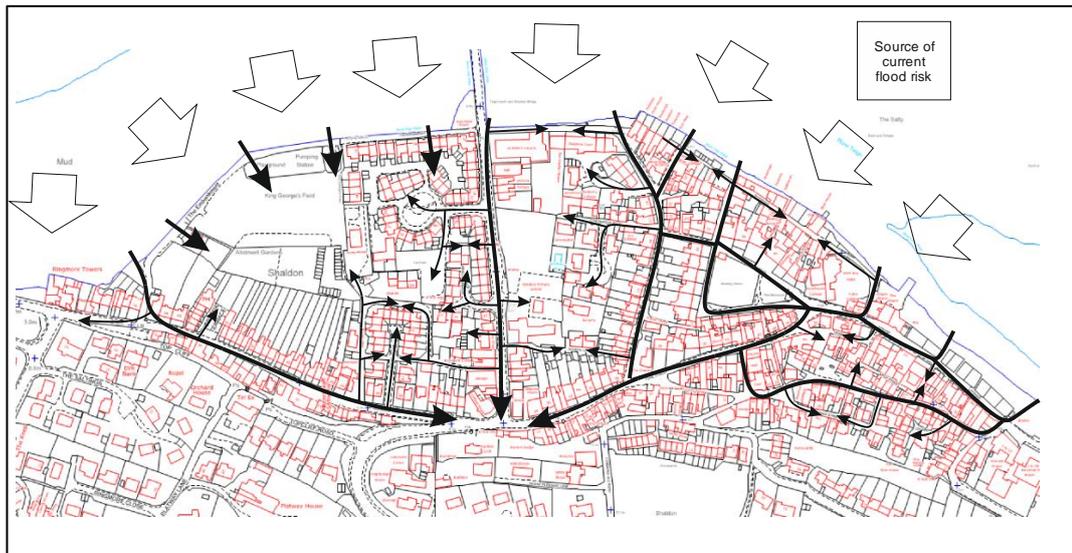


Figure A2. 6 Flood pathways through Shaldon case study area (Author adapted from Digimap)

## Stage 4 – Defining the sub-areas within in case study community

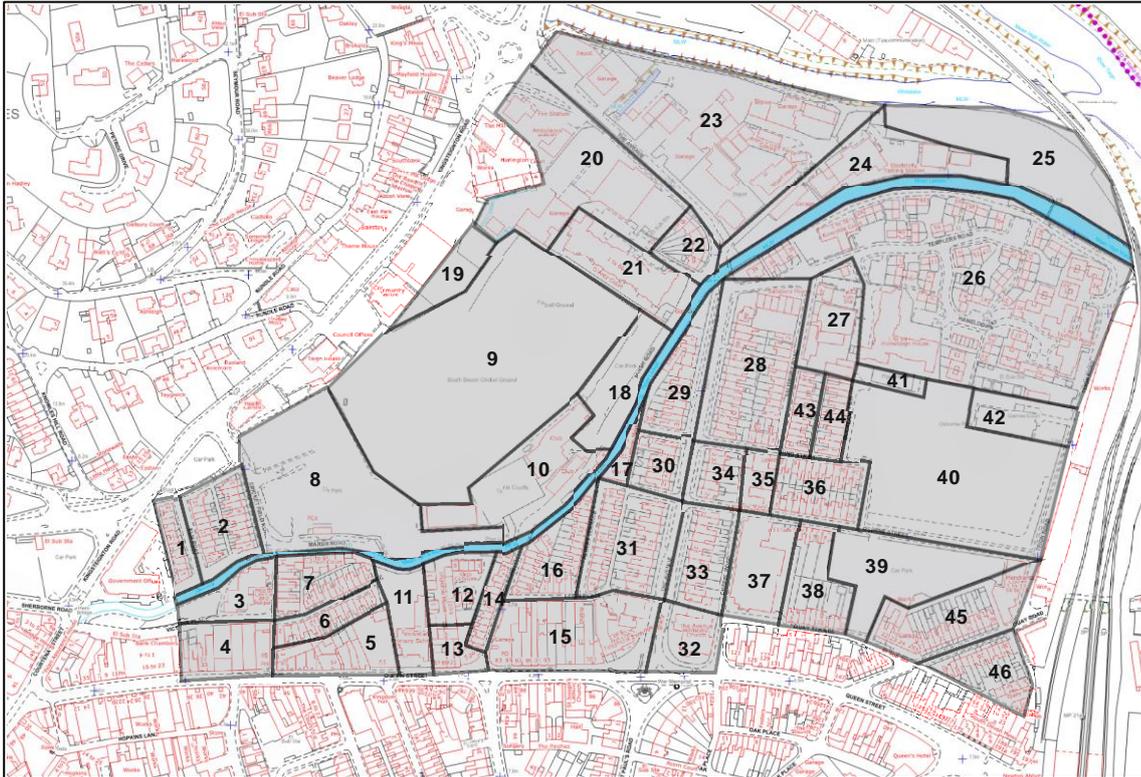


Figure A2.7 Newton Abbot case study area showing sub-areas (Author adapted from Digimap)

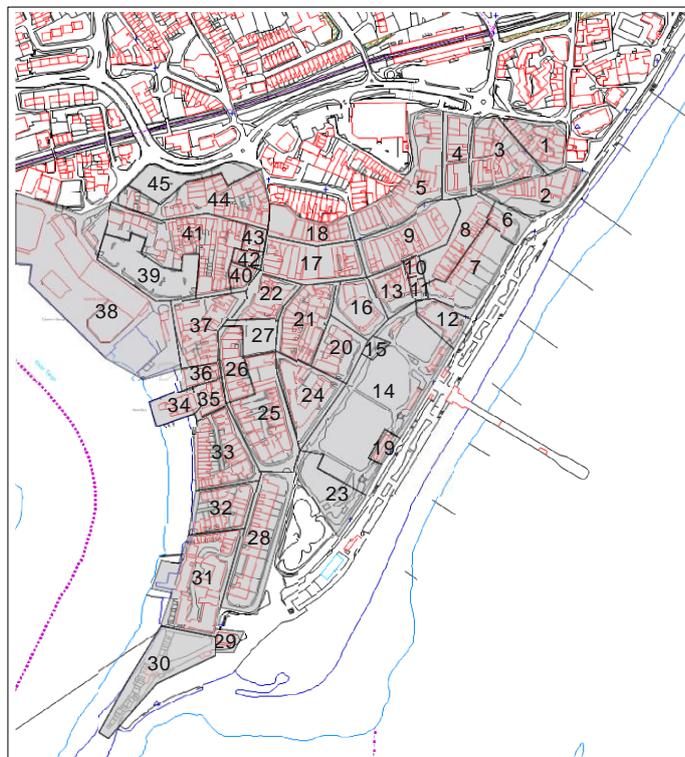
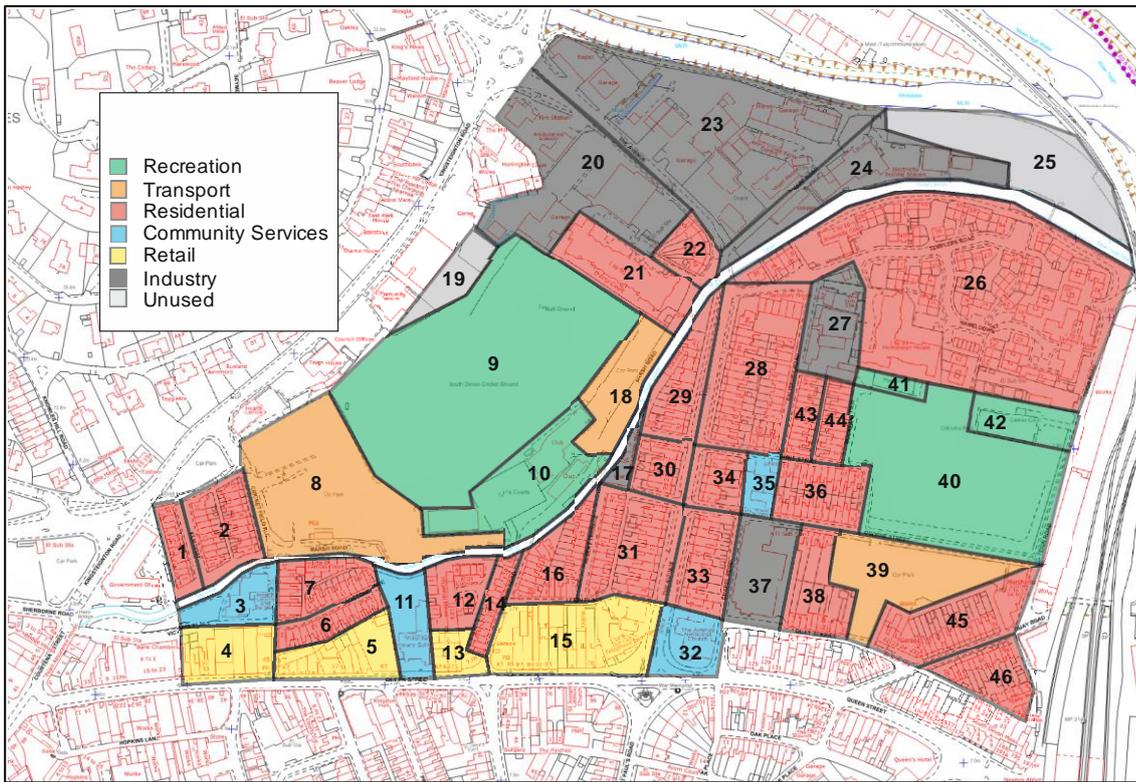


Figure A2.8 Teignmouth case study area showing sub-areas (Author adapted from Digimap)



**Stage 5 – Classifying the sub-divisions within each sub area based on the dominant land use**



**Figure A2.10 Newton Abbot case study area with colouring of sub-areas based on land use classification (Author adapted from Digimap)**

**Table A2.1 Land use classification and number of land parcels for each sub-area in the Newton Abbot case study area (Author)**

Sub-area ID	NLU Code	Description	Number of land Parcels
1	7	Residential	12
2	7	Residential	21
3	8	Community Services	2
4	9	Retail	8
5	9	Retail	13
6	7	Residential	16
7	7	Residential	24
8	5	Transport	1
9	4	Recreation and Leisure	1
10	4	Recreation and Leisure	4
11	8	Community Services	2
12	7	Residential	13
13	9	Retail	10
14	7	Residential	14
15	9	Retail	16
16	7	Residential	26

**Table A2.1 Land use classification and number of land parcels for each sub-area in the Newton Abbot case study area (Author) cont'd**

<b>Sub-area ID</b>	<b>NLU Code</b>	<b>Description</b>	<b>Number of land Parcels</b>
18	5	Transport	1
19	11	Vacant and derelict	3
20	10	Industry and Business	9
21	7	Residential	1
22	7	Residential	6
23	10	Industry and Business	15
24	10	Industry and Business	6
25	13	Not used	1
26	7	Residential	82
27	10	Industry and Business	10
28	7	Residential	40
29	7	Residential	12
30	7	Residential	6
31	7	Residential	24
32	8	Community Services	1
33	7	Residential	10
34	7	Residential	6
35	8	Community Services	1
36	7	Residential	24
37	10	Industry and Business	1
38	7	Residential	18
39	5	Transport	1
40	4	Recreation and Leisure	1
41	4	Recreation and Leisure	1
42	4	Recreation and Leisure	1
43	7	Residential	12
44	7	Residential	12
45	7	Residential	16
46	7	Residential	15
<b>Grand Total</b>			<b>521</b>

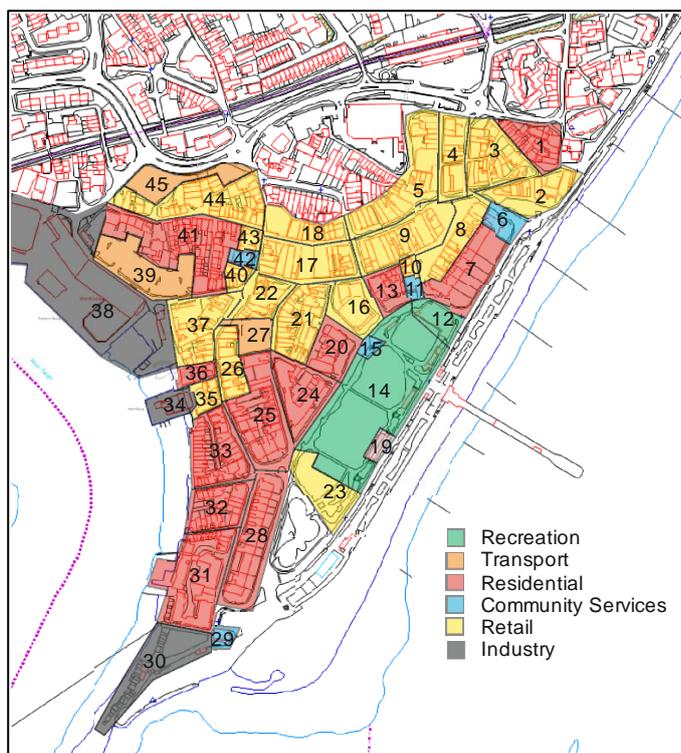


Figure A2.11 Teignmouth case study area with colouring of sub-areas based on land use classification (Author adapted from Digimap)

Table A2.2 Land use classification and number of land parcels for each sub-area in the Teignmouth case study area (Author)

Sub-area ID	NLU Code	Description	Number of land Parcels
1	7	Residential	14
2	9	Retail	12
3	9	Retail	23
4	9	Retail	9
5	9	Retail	21
6	8	Community Services	1
7	7	Residential	6
8	9	Retail	11
9	9	Retail	23
10	9	Retail	1
11	8	Community Services	1
12	4	Recreation	1
13	7	Residential	9
14	4	Recreation	3
15	8	Community Services	1
16	9	Retail	4
17	9	Retail	21
18	9	Retail	10
19	9	Retail	1
20	7	Residential	5

**Table A2.2 Land use classification and number of land parcels for each sub-area in the Teignmouth case study area (Author) cont'd**

<b>Sub-area ID</b>	<b>NLU Code</b>	<b>Description</b>	<b>Number of land Parcels</b>
22	9	Retail	10
23	9	Retail	1
24	7	Residential	2
25	7	Residential	21
26	9	Retail	11
27	5	Transport	1
28	7	Residential	12
29	8	Community Services	1
30	10	Industry	4
31	7	Residential	17
32	7	Residential	21
33	7	Residential	32
34	10	Industry	6
35	9	Retail	9
36	7	Residential	9
37	9	Retail	22
38	10	Industry	10
39	5	Transport	1
40	9	Retail	2
41	7	Residential	58
42	8	Community Services	1
43	9	Retail	3
44	9	Retail	25
45	5	Transport	1
<b>Grand Total</b>			<b>479</b>

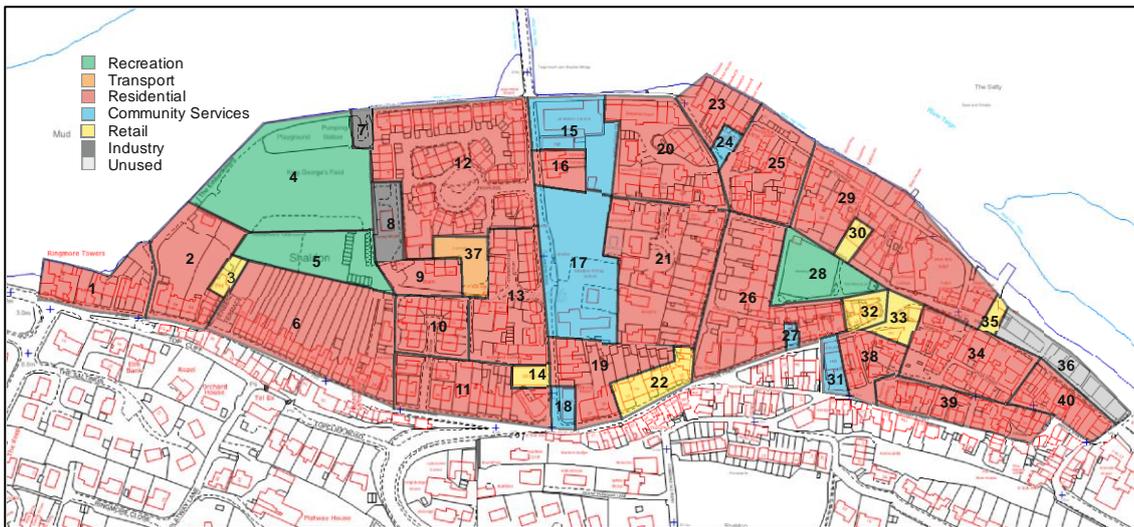


Figure A2.12 Shaldon case study area with colouring of sub-areas based on land use classification (Author adapted from Digimap)

Table A2.3 Land use classification and number of land parcels for each sub-area in the Shaldon case study area (Author)

Sub-area ID	NLU Code	Description	Number of land Parcels
1	7	Residential	14
2	7	Residential	9
3	9	Retail	1
4	4	Recreation	2
5	4	Recreation	1
6	7	Residential	23
7	10	Industrial	1
8	10	Industrial	1
9	7	Residential	3
10	7	Residential	16
11	7	Residential	18
12	7	Residential	47
13	7	Residential	20
14	9	Retail	1
15	8	Community Services	2
16	7	Residential	3
17	8	Community Services	3
18	8	Community Services	1
19	7	Residential	9
20	7	Residential	16
21	7	Residential	22
22	9	Retail	8
23	7	Residential	6
24	8	Community Services	1
25	7	Residential	20

**Table A2.3 Land use classification and number of land parcels for each sub-area in the Shaldon case study area (Author) cont'd**

<b>Sub-area ID</b>	<b>NLU Code</b>	<b>Description</b>	<b>Number of land Parcels</b>
27	8	Community Services	1
28	4	Recreation	2
29	7	Residential	24
30	9	Retail	1
31	8	Community Services	3
32	9	Retail	7
33	9	Retail	3
34	7	Residential	25
35	9	Retail	1
36	11	Unused Land	9
37	5	Transport	1
38	7	Residential	10
39	7	Residential	23
40	7	Residential	14
<b>Grand Total</b>			<b>397</b>

**Appendix III – Questionnaire Data**

In this appendix data relating to the questionnaire survey is presented. First, an illustrative example of the survey questionnaire is provided. The example is the revised pilot study questionnaire, along which lines the main study questionnaire was developed. The main difference between the example shown and the main study questionnaires is that the wording of each question was altered slightly to make it relevant to either a “resident” or an “organisational” respondent.

After the example of the survey questionnaire details about the pilot study are provided. Table A3.1 provides details about the issue and collection of the pilot study sample questionnaires. Initially the idea was to complete the questionnaires with respondents, but only one respondent agreed to that approach. All others requested that the questionnaire be left with them and collected later. This approach had severe logistical implications as indicated by the number of collection attempts needed in order to retrieve the completed questionnaires. Issues were raised by respondents in relation to the questions in the questionnaire quite early on, so edits were made and revised version was issued (Table A3.2). In the end 19No original format questionnaires were issued and 11No revised format questionnaires were issued. The completion rates of the revised questionnaire were much better than the original format and the revised format was used for the main survey.

For the main survey questionnaire, there are 49No questions in each questionnaire data set, as well as additional data about the study site, the land use classification, the land parcel reference, issue date, collection date, collection attempts, issue type and nature of response received. A numerical coding system was used and is explained in detail below.

Column header	Data coding system
IssueNo	Number from 1 to 280
RefSite	1 = Newton Abbot 2 = Teignmouth 3 = Shaldon
LandUse	7 = Residential 9 = Retail 10 = Industry
Parcel	Number from 1 to 46
IssueDate	Date the questionnaire was issued

Column header	Data coding system
CollectDate	Date questionnaire was collected Blank entry = Not returned
CollectAtmp	Number indicating the frequency of attempts to collect the issued questionnaire
IssueType	1 = Resident questionnaire 2 = Organisation questionnaire
Response	Blank = not returned 1 = Completed questionnaire 2 = Questionnaire not completed
Q1, Q2, Q3, Q4	Blank = not returned 1 = Yes 2 = No 99 = Do not know / No clear response
Q5	Blank = not returned 1 = Very confident 2 = Confident 3 = Not sure 4 = Not very confident 5 = Not at all confident 99 = Do not know / No clear response
Q6	Blank = not returned 1 = Very easy 2 = Quite easy 3 = Not sure 4 = Not very easy 5 = Not at all easy 99 = Do not know / No clear response
Q7	Blank = not returned 1 = Very quickly 2 = Moderately quickly 3 = Not sure 4 = Not very quickly 5 = Not quick at all 99 = Do not know / No clear response

Column header	Data coding system
Q8, Q9, Q10, Q11	Blank = not returned 1 = Yes 2 = No 99 = Do not know / No clear response
Q12	Blank = not returned 1 = Very confident 2 = Confident 3 = Not sure 4 = Not very confident 5 = Not at all confident 99 = Do not know / No clear response
Q13	Blank = not returned 1 = Very well 2 = Quite well 3 = Not sure 4 = Not very well 5 = Not at all 99 = Do not know / No clear response
Q14	Blank = not returned 1 = Very resilient 2 = Moderately resilient 3 = Not sure 4 = Not very resilient 5 = Not at all resilient 99 = Do not know / No clear response
Q15, Q16, Q17, Q18	Blank = not returned 1 = Yes 2 = No 99 = Do not know / No clear response

Column header	Data coding system
Q19	Blank = not returned 1 = Very confident 2 = Confident 3 = Not sure 4 = Not very confident 5 = Not at all confident 99 = Do not know / No clear response
Q20	Blank = not returned 1 = Very well 2 = Quite well 3 = Not sure 4 = Not very well 5 = Not at all 99 = Do not know / No clear response
Q21	Blank = not returned 1 = Very resilient 2 = Moderately resilient 3 = Not sure 4 = Not very resilient 5 = Not at all resilient 99 = Do not know / No clear response
Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35, Q36, Q37, Q38	Blank = not returned 1 = Yes 2 = No 99 = Do not know / No clear response
Q39	Blank = not returned 1 = Very easy 2 = Quite easy 3 = Not sure 4 = Not very easy 5 = Not at all easy 99 = Do not know / No clear response

Column header	Data coding system
Q40, Q41, Q49	Blank = not returned 1 = Yes 2 = No 99 = Do not know / No clear response
Q42	Blank = not returned 1 = Very easy 2 = Quite easy 3 = Not sure 4 = Not very easy 5 = Not at all easy 99 = Do not know / No clear response
Q43, Q44	Blank = not returned 1 = Individual resources 2 = Community resources 3 = Business/Organisation resources 99 = Do not know / No clear response
Q45	Blank = not returned 1 = Male 2 = Female 99 = Do not know / No clear response
Q46	Blank = not returned 1 = 18 to 30 years. 2 = 30 to 65 years. 3 = Over 65 years. 99 = Do not know / No clear response
Q47	Blank = not returned 1 = Not resident 2 = Less than 1 yr. 3 = 1 to 5 years. 4 = 5 to 10years. 5 = More than 10 years. 99 = Do not know / No clear response
Q48	Blank = not returned 1 = Resident in local area 2 = Business/Employed in local area 3 = Volunteer work in local area 4 = Resident and Employed 5 = Resident and Volunteer 6 = Employed and Volunteer 7 = Resident, Employed and Volunteer 99 = Do not know / No clear response

Column header	Data coding system
Q49	Blank = not returned 1 = Yes 2 = No 99 = Do not know / No clear response

Example of pilot study questionnaire

## Participant Information Sheet

Title: COMMUNITIES, INSTITUTIONS AND FLOOD RISK;  
MOBILISING SOCIAL CAPITAL TO IMPROVE  
COMMUNITY RESILIENCE



**Researcher:** Andrew Fox  
**Programme of study:** PhD in Geography  
**Faculty/School:** School of Geography, Earth and Environmental Sciences  
**Project Supervisors:** Prof Geoff Wilson and Dr Stephen Essex

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Dear Participant,

You are being invited to take part in a research study as part of a postgraduate programme at the University of Plymouth. Please take time to read the following information carefully.

### The purpose of the study

#### AIM:

This thesis examines the concept of community resilience by exploring the relationship between institutions involved in hazard management and communities at risk from flooding. The aim is to develop a deeper understanding of how institutions and communities can engender and mobilise social capital to improve community resilience.

#### The research activity:

- This part of the research involves a questionnaire designed to explore your understanding of flood risk, communities, institutions involved with flood risk management, social capital and resilience
- There are 49 questions which will take approximately 30 minutes to answer.

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### Do I have to take part?

It is up to you to decide whether or not to take part and you are free to withdraw at any time.

### Will what I say in this study be kept confidential?

All information collected for this study will be kept strictly confidential and full anonymity of participants will be ensured during the collection, storage and publication of research material in accordance with University of Plymouth policies and procedures.

### What will happen to the results of the research study?

The results will be used in a postgraduate PhD dissertation that will be held in the University Library at Plymouth.

#### **Contact details for information about the research project:**

Andrew Fox  
University of Plymouth  
Faculty of Science and Technology  
Department of Marine Science and Engineering  
Drakes Circus  
Plymouth  
Devon, UK  
PL4 8AA

#### **Contact details for ethical enquiries related to the research project:**

Paula Simson  
Secretary to the Human Ethics Committee  
University of Plymouth  
Faculty of Science and Technology  
Drakes Circus  
Plymouth  
Devon, UK  
PL4 8AA

Email: Paula.simson@plymouth.ac.uk

Email: Andrew.fox@plymouth.ac.uk

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**Thank you for taking the time to read this information sheet**

## **Questions about resilience**

Resilience is often described as the ability to recover from crisis events and may be characterised by the ability to withstand the pressure that crisis events create or as a process that enables adaptation to critical incidents.

---

### **Questions about resilience at the individual level**

**Q1. Have you ever been a victim of a flood? Y / N**

If Yes, please provide brief details

--

**Q2. Have you ever provided assistance to a victim of a flood? Y / N**

If Yes, please provide brief details

--

**Q3. Have you ever spent time reflecting on what lessons could be learned from experiences of crisis events such as flooding? Y / N**

If Yes, please provide brief details

--

**Q4. Have you ever changed you thinking or behaviour as a result of your experience of a crisis event such as a flood? Y / N**

If Yes, please provide brief details

--

**Q5. How confident do you feel that you could cope with a crisis incident such as a flood?**

Very Confident	Confident	Not sure	Not very confident	Not at all confident
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**Q6. How well do you understand the hazards the can cause crisis incidents in your life, such as flooding?**

Very well	Quite well	Not sure	Not very well	Not at all
-----------	------------	----------	---------------	------------

**Q7. How resilient do you consider yourself to be?**

Very resilient	Moderately resilient	Not sure	Not very resilient	Not at all resilient
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**Questions about resilience at the community level**

**Q8. Do you know when the local community last experienced a flood? Y / N**

If Yes, please provide brief details

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**Q9. Do you know if the local community has ever provided assistance to victims of a flood? Y / N**

If Yes, please provide brief details

--

**Q10. Do you know if the local community has ever spent time reflecting on the lessons to be learned from their experience of crisis events, such as a flood?**

Y / N

If Yes, please provide brief details

--

**Q11. Do you know if the local community has ever changed its thinking or behaviour as a result of crisis event, such as a flood? Y / N**

If Yes, please provide brief details

--

**Q12. How confident are you that the local community could cope with a future flood event?**

Very Confident	Confident	Not sure	Not very confident	Not at all confident
----------------	-----------	----------	--------------------	----------------------

**Q13. In your opinion, how well does the local community understand the local flood hazard?**

Very well	Quite well	Not sure	Not very well	Not at all
-----------	------------	----------	---------------	------------

**Q14. How resilient do you consider the local community to be?**

Very resilient	Moderately resilient	Not sure	Not very resilient	Not at all resilient
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**Questions about resilience at the institutional level**

**Q15. Within the local community there are a number of businesses and other organisations; do you know if any of these have ever been victims of a flood? Y/N**

If Yes, please provide brief details

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**Q16. Do you know if any of the businesses and organisations based in the local community ever provided assistance to victims of a flood? Y / N**

If Yes, please provide brief details

--

**Q17. Do you know if local businesses and organisations ever spent time reflecting on the lessons learned from crisis events, such as a flood? Y / N**

If Yes, please provide brief details

--

**Q18. Do you know if local businesses and organisations ever changed their thinking or behaviour as a result of a crisis incident, such as a flood, in the local community? Y / N**

If Yes, please provide brief details

--

**Q19. How confident are you that local businesses and organisations could cope with a future flood event?**

Very Confident	Confident	Not sure	Not very confident	Not at all confident
----------------	-----------	----------	--------------------	----------------------

**Q20. In your opinion, how well do local businesses and organisations understand the local flood hazard?**

Very well	Quite well	Not sure	Not very well	Not at all
-----------	------------	----------	---------------	------------

**Q21. Do you consider local businesses and organisations to be resilient?**

Very resilient	Moderately	Not sure	Not very resilient	Not at all
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	resilient			resilient
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## **Questions about social capital**

Social capital is said to be derived from the links that join individuals, institutions and communities together.

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### **Questions about social capital at the individual level**

**Q22. Most individuals belong to numerous social networks, i.e. family, friends, work colleagues, religious, ethnic, age and hobby networks. Can you identify any social networks of which you may describe yourself as a member? (max of 10)**

**Q23. Do you occupy a formal role within any of the social networks of which you are a member? Y / N**

If Yes, please provide brief details

**Q24. Do you know if any of the social networks that you are a member of have a role created specifically to deal with flooding issues? Y / N**

If Yes, please provide brief details

**Q25 If you were a victim of a flood, which of these social networks would you turn to for help?**

### **Questions about social capital at the community level**

**Q26. Most communities include numerous community based groups, i.e. sports clubs, local interest societies, churches, youth groups, etc. Can you identify any community groups in your local area? (max of 10)**

**Q27. Have you ever been a member of any community group? Y / N**

If Yes, please provide brief details

**Q28. Do you know if any of the local communities groups have a role created specifically to deal with flooding issues? Y / N**

If Yes, please provide brief details

**Q29. If the local community was the victim of a flood, do you consider that local community groups would be able to provide help to the flood victims?**

Y / N / Do not know

If Yes, please provide brief details

**Questions about social capital at the institutional level**

**Q30. Within the community there numerous businesses and other organisations, can you identify the local businesses/organisations that are most at risk from a flood? (max of 10)**

**Q31. Have you ever been employed by a local business/organisation? Y / N**

If Yes, please provide brief details

**Q32. Do you know if any of the local businesses/organisations have a role created specifically to deal with flooding issues? Y / N**

If Yes, please provide brief details

**Q33. If the local community was the victim of a flood, do you consider that local businesses/organisations would be able to provide help to the flood victims?**

Y / N / Do not know

If Yes, please provide brief details

## **Questions about other capital resources**

Social capital is partly derived from a range of other capital resources, namely:

Economic capital: derived from financial resources  
Human capital: derived from knowledge resources  
Physical capital: derived from physical resources  
Cultural capital: resources derived from social positions

---

### **Questions about your personal capital resources:**

**Q34. If you were the victim of a flood, what capital resources do you have to help you recover from the crisis?**

**Q35. Are there any conditions that would need to be satisfied before you would mobilise your personal resources to help you recover from a flood?**

Y / N

If Yes, please provide brief details

**Q36. If required to mobilise your personal resources because of a flood, which resources would you use as a first or last resort?**

### **Questions about capital resources in the local community**

**Q37. Are you aware of any resources that the local community has and that may help it recover from a flood event? Y / N**

If Yes, please provide brief details

**Q38. Do you know if the local community has any plans to acquire more resources to better protect itself from the risk of flooding? Y / N**

If Yes, please provide brief details

--

**Q39. If the local community was a victim of a flood, how easy would it be for it to mobilise resources to help it recover?**

Very easy	Quite easy	Not sure	Quite difficult	Very difficult
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**Questions about capital resources in local institutions**

**Q40. Are you aware of any resources that local businesses/organisations may have and that may help the community recover from a flood event? Y / N**

If Yes, please provide brief details

--

**Q41. Do you know if any local businesses/organisations have plans to acquire more resources that would help to protect the community from the risk of flooding? Y / N**

If Yes, please provide brief details

--

**Q42. If the local community was a victim of a flood, how easy would it be for the community to mobilise resources held by local businesses/organisations?**

Very easy	Quite easy	Not sure	Quite difficult	Very difficult
-----------	------------	----------	-----------------	----------------

**Q43. Which resources do you consider to be most effective in helping the community as a whole to recover from a flood event?**

Individuals resources	Community resources	Business/Organisation resources
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**Q44. Which resources do you consider to be least effective in helping the community as a whole to recover from a flood event?**

Individuals resources	Community resources	Business/Organisation resources
-----------------------	---------------------	---------------------------------

**General background questions:**

**Q45. What is your gender?** Male / Female

**Q46. What is your age range?**

18 to 30 years	30 to 65 years	Over 65 years
----------------	----------------	---------------

**Q47. How long have you been resident/working in the community?**

Not resident	Less than 1 year	1 to 5 years	5 to 10 years	More than 10 years
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**Q48. Which of the following statements best describes you?**  
(you may tick more than one box)

I am a resident in the local area	
I have a business or paid employment in the local area	
I am engaged in voluntary or unpaid work with community groups in the local area	

---

It is the intention of this study to follow-up the questionnaire survey with some more in-depth interviews.

**Q49 Would you be willing to take part in a follow-up interview:** Y / N

If "Yes", please provide some contact details

Contact name: \_\_\_\_\_

Telephone number: \_\_\_\_\_

Email: \_\_\_\_\_

**Thank you for taking part in this survey**

**Andrew Fox**

**Table A3.1 Pilot study questionnaire issue and collection data (Author)**

Questionnaire Number	Sex	Age	Area	Classification	House No	Date of Issue	Date of Collection	Collection Attempts	Collection Comments
1	M	2	26	7	?	27-Aug	27-Aug	1	Left on doorstep
2	F	1	26	7	?	27-Aug		0	In post
3	F	2	26	7	5	27-Aug	01-Sep	3	Personal collection
4	F	3	26	7	-	27-Aug	01-Sep	2	Personal collection
5	M	2	27	10	5	27-Aug	09-Sep	1	Personal collection
6	F	2	28	7	6	27-Aug	13-Sep	6	Interview
7	M	1	43	7	14	27-Aug	09-Sep	2	Personal collection
8	F	2	44	7	-	27-Aug	01-Sep	3	Personal collection
9	F	3	29	7	-	27-Aug	13-Sep	7	Left on doorstep
10	F	1	28	7	-	27-Aug	13-Sep	7	Personal collection
11	M	1	36	7	1	01-Sep	09-Sep	2	Personal collection

**Table A3.1 Pilot study questionnaire issue and collection data (Author) cont'd**

Questionnaire Number	Sex	Age	Area	Classification	House No	Date of Issue	Date of Collection	Collection Attempts	Collection Comments
12	M	1	38	7	10	01-Sep	13-Sep	3	Personal collection
13	M	2	45	7	33	01-Sep	09-Sep	2	Personal collection
14	F	2	46	7	26	01-Sep	09-Sep	1	Personal collection
15	F	3	31	7	7	01-Sep	09-Sep	1	Left on doorstep
16	M	1	33	7	14	01-Sep	13-Sep	2	Left on doorstep
17	M	2	16	7	3	01-Sep	09-Sep	1	Personal collection
18	F	2	14	7	12	01-Sep	09-Sep	1	Left on doorstep
19	M	3	12	7	1	01-Sep	09-Sep	1	Personal collection
20	M	3	6	7	8	01-Sep	09-Sep	1	Personal collection
21	F	1	7	7	17	09-Sep	13-Sep	2	Personal collection

**Table A3.1 Pilot study questionnaire issue and collection data (Author) cont'd**

Questionnaire Number	Sex	Age	Area	Classification	House No	Date of Issue	Date of Collection	Collection Attempts	Collection Comments
22	M	1	2	7	1	09-Sep		2	Not done
23	F	1	1	7	1	09-Sep	09-Sep	1	Left on doorstep
24	F	1	4	9	-	09-Sep	13-Sep	1	Personal collection
25	F	3	5	9	51	09-Sep		1	Not done
26	M	2	15	9	-	09-Sep		1	Not done – lost?
27	F	1	32	8	-	09-Sep		1	Not done
28	M	2	20	10	-	09-Sep		2	Not done – lost?
29	M	2	23	10	-	09-Sep	13-Sep	1	Personal collection
30	F	2	11	8	-	09-Sep		1	Not done – lost?

**Table A3.2 Pilot study questionnaire issue and collection data analysis (Author)**

<u>Questionnaire</u>	Issue Data			<u>Responses</u>	Response Data		
	Original	Revised	Overall		Original	Revised	Overall
Sample Size	19	11	30	Return rate	95%	91%	93%
Questions	80	74		Questions Answered	48%	57%	54%
Qualitative Questions	31	31		Qualitative Questions Answered	66%	87%	77%
<u>Sex</u>				<u>Sex</u>			
Male	11	4	15	Male	100%	100%	100%
Female	8	7	15	Female	88%	86%	87%
<u>Age</u>				<u>Age</u>			
18-30	5	6	11	18-30	80%	83%	82%
30-65	9	4	13	30-65	100%	100%	100%
>65	5	1	6	>65	100%	100%	100%
<u>Land Use Classification</u>				<u>Land Use Classification</u>			
Residential	18	4	22	Residential	94%	100%	97%
Business	1	2	3	Business	100%	100%	100%
Community Service	0	2	2	Community Service	N/A	50%	50%
Recreation	0	0	0	Recreation	N/A	N/A	N/A
Retail	0	3	3	Retail	N/A	33%	33%

**Appendix IV – Interview Data**

## **Outline of Appendix IV**

In this appendix details of the interview questions are first presented.

Subsequently transcripts of interviews with five incumbents of FRM roles with links to the case study communities are included.

## Participant Information Sheet

Title: COMMUNITIES, INSTITUTIONS AND FLOOD RISK;  
MOBILISING SOCIAL CAPITAL TO IMPROVE  
COMMUNITY RESILIENCE



**Researcher:** Andrew Fox  
**Programme of study:** PhD in Geography  
**Faculty/School:** School of Geography, Earth and Environmental Sciences  
**Project Supervisors:** Prof Geoff Wilson and Dr Stephen Essex

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Dear Participant,

You are being invited to take part in a research study as part of a postgraduate programme at the University of Plymouth. Please take time to read the following information carefully.

### **The purpose of the study**

#### AIM:

This thesis examines the concept of community resilience by exploring the relationship between institutions involved in hazard management and communities at risk from flooding. The aim is to develop a deeper understanding of how institutions and communities can engender and mobilise social capital to improve community resilience.

#### The research activity:

- This part of the research involves an interview designed to explore your role and the role of the organisation you represent in the management of flood risks.
- There are three study sites involved in this research – NEWTON ABBOT, TEIGNMOUTH and SHALDON
- The interview includes 42 questions and will take approximately 60 minutes to complete.

---

### **Do I have to take part?**

It is up to you to decide whether or not to take part and you are free to withdraw at any time.

### **Will what I say in this study be kept confidential?**

All information collected for this study will be kept strictly confidential and full anonymity of participants will be ensured during the collection, storage and publication of research material in accordance with University of Plymouth policies and procedures.

### **What will happen to the results of the research study?**

The results will be used in a postgraduate PhD dissertation that will be held in the University Library at Plymouth.

### **Contact for further information:**

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**Thank you for taking the time to read this information sheet**

## Interview Questions

### **A About you**

- 1 How long have you worked for your organisation?
- 2 How long have you occupied your current role?
- 3 What duties are assigned to the role you occupy?
- 4 How long has your role existed?
- 5 Do you have access to any of the previous occupants of your current role?
- 6 How frequently are you in contact with any of the previous occupants of your current role?

### **B About the role you are undertaking**

- 1 Have there been any significant changes to the role you occupy since it was created?
- 2 Is there a need to change the role you occupy to make it easier for you to enact your duties?
- 3 Does your role allow you to influence policy decisions within your organisation?
- 4 Do you ever feel that new rules are being imposed on your role without your full agreement or involvement?
- 5 Are the meanings and purpose of the rules you are required to enact clear to you?
- 6 How free are you to make decisions based on what you think is most appropriate to a given situation without being constrained by rules?

### **C About your organisation**

- 1 Has your organisation undergone any significant change in recent years?
- 2 How important are external pressures on internal policy making of your organisation?
- 3 Are new rules ever imposed in your organisation due to external local pressure?
- 4 How easy is it for external parties to scrutinise the work of your organisation?

- 5 How would you rank the social status of your organisation in the local community?
- 6 If you came up with a radical solution to dealing with a problem, how easy would it be to get your organisation to adopt your solution?

**D Engaging with the study communities**

- 1 How significant is the presence of your organisation in the study communities?
- 2 Does your role engage you with members of the study communities?
- 3 Are there any restraints imposed on the frequency of face-to-face contact with the members of the study communities?
- 4 If you are not available how many alternative roles can substitute for you in your absence?
- 5 Are you a member of any sub-grouping related to your role?
- 6 How easy is it for you contact other organisations on issues related to your role?

**E Your personal role in flood risk management**

- 1 Does your role require you to liaise with other organisations on flood risk issues?
- 2 Does your role give you control over any resources or information related to flood risk management in the study communities?
- 3 How often are you contacted by other organisations on issues related to flood risk management?
- 4 Have you encountered much opposition from the study communities when attempting to implement flood risk policies?
- 5 How easy is it for you to access expert opinion on issues related to flood risk in the study communities?
- 6 Have you encountered any challenges in maintaining relations with other organisations involved in local flood risk management?

**F Your organisation's role in flood risk management**

- 1 How strong are the links that bind your organisations to other organisations dealing with flood risk management in the study area?
- 2 How long have the relations between your organisation and other organisations dealing with flood risk issues been established?

- 3 How easy is it for members of the study communities to access information held by your organisation about local flood risk management arrangements?
- 4 Have the roles dealing with flood risk management changed in recent years?
- 5 How often do occupants of roles related to local flood risk management meet face-to-face with each other?
- 6 How often do occupants of roles related to local flood risk management meet face-to-face with the study communities?

**G Dealing with organised groups in the study communities**

- 1 How easy is it to engage with the study communities?
- 2 How much of the contact with the study communities is done through organised community groups?
- 3 Do local community groups make it easier to engage with the study communities?
- 4 Are there a sufficient number of organised groups in the study communities to make liaison with them effective?
- 5 What challenges do organised community groups present to organisations responsible for managing the local flood risk?
- 6 What benefits do organised community groups present to organisations responsible for managing the local flood risk?

## Interview 01

### A About you

1 How long have you worked for your organisation?

7 years

2 How long have you occupied your current role?

7 years since the CCA 2004.

3 What duties are assigned to the role you occupy?

Emergency Planning Office. I also am a manager. I get teams to respond and I make sure that they do it.

4 How long has your role existed?

7 years – I was embedded into the Drainage and Coastal team before.

5 Do you have access to any of the previous occupants of your current role?

Yes at the beginning, but not anymore. I was in contact with the group engineer for drainage and coastal. He put together an emergency plan for the council before the CCA 2004

6 How frequently are you in contact with any of the previous occupants of your current role?

Frequently at the beginning, he mentored me when I was given my current role. No longer in contact.

**B About the role you are undertaking**

- 1 Have there been any significant changes to the role you occupy since it was created?

NO. But we are in the process of refining it Devon wide to make it more efficient – sharing resources and staff, but duties do not change as Act remains the same

- 2 Is there a need to change the role you occupy to make it easier for you to enact your duties?

No as the duties are laid out in the CCA and that has not changed.

- 3 Does your role allow you to influence policy decisions within your organisation?

Yes. I wrote the policy and I train the others on how to implement it.

- 4 Do you ever feel that new rules are being imposed on your role without your full agreement or involvement?

Not forced to adopt, the other way around – we are pushing for better communication.

- 5 Are the meanings and purpose of the rules you are required to enact clear to you?

Not asked [not an issue]

- 6 How free are you to make decisions based on what you think is most appropriate to a given situation without being constrained by rules?

Very free. I am very lucky that I have had plenty of time to do the role, but I am about to take on a fourth role so my time will be cut to do this role. ! day per week is more normal

## **C About your organisation**

- 1 Has your organisation undergone any significant change in recent years?

Not really, but removal of management layers has happened. Because we are a political organisation the priority for politicians is that the cutting face is made more effective.

- 2 How important are external pressures on internal policy making of your organisation?

Important. As a BCM officer I talk to Councillors about restructuring. Cuts of 10m do have an impact, but they must not impact of the delivery of services.

- 3 Are new rules ever imposed in your organisation due to external local pressure?

Not asked [yes]

- 4 How easy is it for external parties to scrutinise the work of your organisation?

There is a scrutiny committee who have complete access to scrutinise what is done. For the public there is the freedom of information act.

- 5 How would you rank the social status of your organisation in the local community?

Pretty damn good. National indicators show that the perception of the council is good. Town Council is about the flower beds, district is where local services are actually run – benefits, planning, housing – we are the local people's council.

- 6 If you came up with a radical solution to dealing with a problem, how easy would it be to get your organisation to adopt your solution?

Easy, because they are taking my advice already. Managers are respected and encouraged to do horizon scanning.

## **D Engaging with the study communities**

- 1 How significant is the presence of your organisation in the study communities?

High, County is seen as remote. County deals with Highways and Adult Community Services. In Emergency Planning the district is seen as the one to sort things out. Town and Parishes are very variable, some are very well organised and some are not.

- 2 Does your role engage you with members of the study communities?

Definitely. I started with [Name Redacted] in Shaldon in 2007, as they were the most vulnerable. The EA has a very good approach to dealing with communities - Rather than say we have a plan, they say "do you think it's a good idea that we have a plan?" They went to Teignmouth first and they said NO to the plan and the EA was surprised, so Shaldon they did it differently. We split Newton Abbot from Kingsteignton so to us there are 4 communities at flood risk and they have different plans.

- 3 Are there any restraints imposed on the frequency of face-to-face contact with the members of the study communities?

Yes, self-imposed policy. One full meeting with members the community at the start of the plan, but often needs 2-3 meetings to get plan finalised. Then I telephone annually to ask if they have up-dated the plans. In addition there is a quarterly newsletter – very much part of "informing" (under warning and informing duty). District is the bridge between the community and the county.

- 4 If you are not available how many alternative roles can substitute for you in your absence?

Yes I have a top team trained. There are 12-13 people and anyone could fulfil my role at an emergency. My aim is that every district will have a top team like mine.

- 5 Are you a member of any sub-grouping related to your role?

4 strands to my role - Plan development, warning and informing, training, communications with others. Latter can be very involved.

- 6 How easy is it for you contact other organisations on issues related to your role?

Very easy. Since the CCA things have improved significantly.

## **E Your personal role in flood risk management**

- 1 Does your role require you to liaise with other organisations on flood risk issues?

Internally I liaise mainly with the internal drainage team and they do a lot of the liaison with external bodies on flood issues, they also help out generally on planning issues. We are lucky to have a large team. We also liaise with DCC flood risk management team set up after the Pitt Report. Also liaise a lot with the EA.

- 2 Does your role give you control over any resources or information related to flood risk management in the study communities?

No control, I only advise. But we do issue sand bags. Other than that the quarterly newsletter. We started advising people that if they wanted sand bags they were probably at risk and should install flood boards, now we do not supply as many sand bags – this was an important change in the mind-set of the community, who used to think that the council would always provide help – “we turned the tide” and we are still trying to encourage self-help – that has worked and we are now doing it at the town and parish level.

- 3 How often are you contacted by other organisations on issues related to flood risk management?

I do go to meeting of the combined local authorities, it is recent and although there are 28 parishes & towns only 6 may turn up. It is part of the big society initiative. The newsletter helps to promote contacts and we are seeing new enquiries come through from presentation I made at the meeting.

- 4 Have you encountered much opposition from the study communities when attempting to implement flood risk policies?

Occasional opposition, which is cultural – people not interested unless they are personally affected.

- 5 How easy is it for you to access expert opinion on issues related to flood risk in the study communities?

Not asked [easy]

- 6 Have you encountered any challenges in maintaining relations with other organisations involved in local flood risk management?

Not asked [no]

**F Your organisation's role in flood risk management**

- 1 How strong are the links that bind your organisations to other organisations dealing with flood risk management in the study area?

As it happens, the guy who was responsible for FRM at district is now at County. He is about to move, but is still with the district. You need to have strong relations with the EA and the District has always done that. This is unusual as most counties run combined planning but Devon is still very much County-District so the district here has strong links.

- 2 How long have the relations between your organisation and other organisations dealing with flood risk issues been established?

A very long time. We have been doing flood risk management for many years, we hold the plans and we sort out disputes.

- 3 How easy is it for members of the study communities to access information held by your organisation about local flood risk management arrangements?

Not asked

- 4 Have the roles dealing with flood risk management changed in recent years?

Following the Pitt report FRM responsibility was transferred to top tier county authorities. District had been doing it for years and now County has to re-invent it. The regional level of emergency planning was recently been abolished. LRF are formed around the 40 National Police Authorities and the Regional Gov for the SW had a Regional Resilience Forum which included 4 or 5 LRFs. Now there is the Resilience and Emergency Division (RED) – there are 3 and one for the whole of the South and West, based in Bristol.

- 5 How often do occupants of roles related to local flood risk management meet face-to-face with each other?

The LRF flood group meets 1 per quarter and we talk every time there is a bit of bad weather. Since the plans have been prepared, we meet less often, but it has taken years to reach this stage.

- 6 How often do occupants of roles related to local flood risk management meet face-to-face with the study communities?

I do not have the time to engage with every group in the community. I only engage when the community approaches us – not the other ways around.

**G Dealing with organised groups in the study communities**

1 How easy is it to engage with the study communities?

Very easy at parish and town council level

2 How much of the contact with the study communities is done through organised community groups?

Difficult to say, we react to whoever approaches us

3 Do local community groups make it easier to engage with the study communities?

Not really, we do not actively seek to engage with them, but if they come to us we are happy to help – they have to be motivated.

4 Are there a sufficient number of organised groups in the study communities to make liaison with them effective?

Not the issue

5 What challenges do organised community groups present to organisations responsible for managing the local flood risk?

They are often in denial of the threat. We are trying to turn around the perception that the council will help every time there is a problem, I see this a lot – We tell them they have to help themselves.

6 What benefits do organised community groups present to organisations responsible for managing the local flood risk?

If a group was motivated it makes it easier for us and them to plan, to prepare and to respond.

## Interview 02

### A About you

1 How long have you worked for your organisation?

5years

2 How long have you occupied your current role?

09-10 Chairman and 11-12 Chairman

3 What duties are assigned to the role you occupy?

To respond to day to days issues on parish affairs – dog poo and dog bins to emergency planning. We are link between the local community and district council. We are on the ground and can listen to local public concerns and take them forward.

4 How long has your role existed?

It was formed in 1984.

5 Do you have access to any of the previous occupants of your current role?

Yes, I am in contact with at least 3 past chairmen and there are at least another couple. The clerk is the person that maintains records and helps with continuity.

6 How frequently are you in contact with any of the previous occupants of your current role?

Not asked.

**B About the role you are undertaking**

- 1 Have there been any significant changes to the role you occupy since it was created?

Not really

- 2 Is there a need to change the role you occupy to make it easier for you to enact your duties?

There is an intention to divest responsibility down to parish level. We are concerned that the district is trying to get rid of its assets and pass them down to the parish level, but we have no money or people to handle new responsibility. We are reluctant to take on management responsibility. The parish council is too small. Even taking on public toilets is too big. We have a total income of 19K. District Councillors are paid, we are not.

- 3 Does your role allow you to influence policy decisions within your organisation?

Yes, It is up to me to select issues that are important and to get other councillors on board. The council has 7 members.

- 4 Do you ever feel that new rules are being imposed on your role without your full agreement or involvement?

Yes – the Localism Bill is a worry.

- 5 Are the meanings and purpose of the rules you are required to enact clear to you?

It is usually very muddled as the directives are not clear.

- 6 How free are you to make decisions based on what you think is most appropriate to a given situation without being constrained by rules?

I raise issues, but I cannot pursue issues on my own.

## **C About your organisation**

- 1 Has your organisation undergone any significant change in recent years?

Not really – we have a very restricted remit, unlike TTC who have more money and a much larger remit (160k).

- 2 How important are external pressures on internal policy making of your organisation?

Not asked [important]

- 3 Are new rules ever imposed in your organisation due to external local pressure?

Not asked [yes]

- 4 How easy is it for external parties to scrutinise the work of your organisation?

There is always a space on meeting agendas for public comment. Minutes are posted on the website and on the local parish notice board.

- 5 How would you rank the social status of your organisation in the local community?

3 Bands of opinion – No opinion [holiday lets], Nigglers and complainers [council should do everything], Committed groups who generally support the work of the council [usually through local groups]

- 6 If you came up with a radical solution to dealing with a problem, how easy would it be to get your organisation to adopt your solution?

Easy, example of sea scouts new building. TDC refused bid by SPC but SPC now supporting Sea Scouts. TDC is a difficulty as they are only concerned with cutting money so we struggle to get them to do anything positive. I supported the idea that we should come up with a parish plan for housing etc. but I could not get sufficient community support. If we had a plan it is more likely that we could get money, but only if the community supports it. We recently lost a library and we are likely to lose the ferry boat workshop and I would like the community to take them on. Either we can respond to issues as they come along, but it is too late as we will not have the community with us, or we can be proactive in anticipating problems and plan for them. We could raise our “prefect” to cover these costs, but it may split the community. There is no pressure from the community to raise additional money.

**D Engaging with the study communities**

- 1 How significant is the presence of your organisation in the study communities?

Very significant

- 2 Does your role engage you with members of the study communities?

We have an annual parish council meeting where members of the public are invited. Public can also attend our monthly meetings.

- 3 Are there any restraints imposed on the frequency of face-to-face contact with the members of the study communities?

Can set up a working party if necessary to deal with extra issues, e.g. Diamond jubilee working committee.

- 4 If you are not available how many alternative roles can substitute for you in your absence?

Vice chair can easily fill in. Do a lot by email in advance of a meeting, so issues are often nearly resolved before the meeting happens.

- 5 Are you a member of any sub-grouping related to your role?

2-3 working parties on the go at any one time. The flood issue was one such working party.

- 6 How easy is it for you contact other organisations on issues related to your role?

Easy

## **E Your personal role in flood risk management**

- 1 Does your role require you to liaise with other organisations on flood risk issues?

Any planning application affecting our community is given to the parish council for comment. I used to run the sandbag group which liaised with the environment agency to help with flooding and we had 30 volunteers. We work closely with TDC, EA and the flood defence scheme contractor Interserve.

- 2 Does your role give you control over any resources or information related to flood risk management in the study communities?

Sandbagging is more or less over; we have an emergency sandbagging team if the flood gates cannot be closed. We have taken over responsibility for gritting minor roads [part of the snow warden scheme].

- 3 How often are you contacted by other organisations on issues related to flood risk management?

Developing an emergency plan in on our agenda – not yet but in the future. We are in monthly contact with the EA and we organise a 6monthly flood response practice with the EA, when we close the flood gates. We have 10 gates and 4-5 teams to deal with the different gates – the closing of the gates is quite a complicated task.

- 4 Have you encountered much opposition from the study communities when attempting to implement flood risk policies?

Right at the beginning there was quite a bit of disbelief about a flood risk. The link to climate change was not well accepted. People were more concerned with the aesthetics and not the degree of protection provided. 2008 was a very close call and that did help to focus people. Most people were very anxious about rain runoff flooding, not sea flooding. Fortunately the EA took on this concern and dealt with the issue at the same time as the tidal flood. EA have given us authority to open gates is water starts accumulating behind the gates to let it runoff.

- 5 How easy is it for you to access expert opinion on issues related to flood risk in the study communities?

Has been easy, EA did most of the technical liaison and they have been very good. At the early stage the EA appointed an independent liaison person and that was very good. They did this after “balls up” at Teignmouth.

- 6 Have you encountered any challenges in maintaining relations with other organisations involved in local flood risk management?

Changes in personnel not really an issue. Maintaining equipment like keys, clothing, tools is a challenge.

**F Your organisation's role in flood risk management**

- 1 How strong are the links that bind your organisations to other organisations dealing with flood risk management in the study area?

TDC have been very good and they are encouraging us to set create an emergency plan. Up until now we did not have the energy to do it. One of our councillors is on TDC and on DCC. As a result of the Flood scheme our bond with EA is very strong.

- 2 How long have the relations between your organisation and other organisations dealing with flood risk issues been established?

Up until the scheme we only really had relations with TDC not really with the EA.

- 3 How easy is it for members of the study communities to access information held by your organisation about local flood risk management arrangements?

Not asked [info posted]

- 4 Have the roles dealing with flood risk management changed in recent years?

Major change was from sandbagging to gate closure. As far as SPC is concerned the role has not changed.

- 5 How often do occupants of roles related to local flood risk management meet face-to-face with each other?

Not asked [often]

- 6 How often do occupants of roles related to local flood risk management meet face-to-face with the study communities?

Not asked [often]

## **G Dealing with organised groups in the study communities**

- 1 How easy is it to engage with the study communities?

We do not really know who the vulnerable people are and we are not very clear on evacuation plans. We need a “neighbourhood watch” plan, where neighbours look after vulnerable members of the community. Local people are more likely to trust the SPC in this than the TDC.

- 2 How much of the contact with the study communities is done through organised community groups?

Working parties do much of the contact work.

- 3 Do local community groups make it easier to engage with the study communities?

By and large it is easier to work with organisations, but occasionally we have to work with individuals, say by public meetings. There may be an activist within a community who wishes to engage public support and we can help by organising a public meeting.

- 4 Are there a sufficient number of organised groups in the study communities to make liaison with them effective?

I think there are an awful lot of people who do not participate in anything and NIMBYs are often in this group. I produced a strategy to say what the council aims where and distributed to every household which tried to access those not in groups.

- 5 What challenges do organised community groups present to organisations responsible for managing the local flood risk?

There are many contrary views so knowing who to liaise with is tricky. The main difficulty we face is that groups think we have more power than we actually have in relation to: money, planning and control of development. We have to actively promote the views of the groups which may also be a challenge.

- 6 What benefits do organised community groups present to organisations responsible for managing the local flood risk?

They are essential to ensure the community remains active and vibrant. By dealing with groups we can tap into their knowledge, identify issues and problems and then we can address them. They also provide volunteers.

## Interview 03

### A About you

1 How long have you worked for your organisation?

I work for the Town centre Partnership, and that is a partnership between town council, district council and county council as well as local businesses all pay towards my salary.

2 How long have you occupied your current role?

3years as Town development manager. Before was centre manager in Exeter.

3 What duties are assigned to the role you occupy?

To promote the economic development of the town, to engage with businesses to communicate to businesses on behalf of local authorities anything that is to their benefit and vice versa, so if local businesses have an issue I would identify how we could best resolve that issue. My job is to know who deals with the issue and this is the fundamental problem as the business community do not understand how things work – they think there is one council that controls everything – even things they do not control, so there is this view that if there is a problem in any walk of life it's the council's fault. So I view my challenge as how to get across to the business community the actually it may be your own fault, it may be society, it may be the town council, it may be the district council, the county council, it might be the police, it might be a private individual, it might be the environment agency, so I spend most of my day directing members of the community to the right agency that is responsible for that.

4 How long has your role existed?

There has been a town centre manager, as slightly different role, that was a district council employee that responsibility for the markets, so there has been a role as town management but it was a slightly different one.

5 Do you have access to any of the previous occupants of your current role?

It was a redundant situation, I do not have any contract with the previous occupant

6 How frequently are you in contact with any of the previous occupants of your current role?

N/A



**B About the role you are undertaking**

- 1 Have there been any significant changes to the role you occupy since it was created?

I basically developed the role myself and I have shaped and developed the role as appropriate, I do answer to the partnership, but I have very much led the way. I tell them what I am doing and ask them for guidance as necessary, but generally it has gone the way I forged it myself.

- 2 Is there a need to change the role you occupy to make it easier for you to enact your duties?

The role is finishing, I am at the end of my 3yr contract. The County and District can no longer fund their bits, so over the last 12months I have developed a bid for a business improvement district, as a way of maintaining town management but funded entirely by the business community. It was not successful because ASDA voted no. Now the Councils are exploring options, and they recognise that they need some form of town management, but it would be a different role. The problem has been to convince businesses, that are being quite successful that they need the town management – if it ain't broke don't fix it, but they didn't understand that if we didn't have town management we would go backwards. We are ahead of the game at the moment, if we don't have one of these we will fall back. It is very difficult to get people to understand that. I was involved in Emergency Planning in my previous role and we did have a bomb alert in Giraffe – if I had stayed here longer my goal was to have something similar as there is no reason why the private business sector should not have a plan, not just for flood but for any emergency, and there isn't anything in this town at the moment. That is something I wanted to facilitate with the police.

- 3 Does your role allow you to influence policy decisions within your organisation?

yes

- 4 Do you ever feel that new rules are being imposed on your role without your full agreement or involvement?

Not particularly

- 5 Are the meanings and purpose of the rules you are required to enact clear to you?

Skipped

- 6 How free are you to make decisions based on what you think is most appropriate to a given situation without being constrained by rules?

Very free

## **C About your organisation**

- 1 Has your organisation undergone any significant change in recent years?

It will be because it will become defunct. It has not changed in the 3years. Could change within the year.

- 2 How important are external pressures on internal policy making of your organisation?

Yes, it is primarily a funding thing. I think it is a combination of the economic situation where all the councils are having to make cuts, and the role was seen as one that could be cut, which shows that they did not see it as that important. Not because times are good, but because there was a belief that something else could pay for it, which is against the ethos of the business improvement district as it is supposed to add to and not replace services. Now that it has not been successful they are reviewing that.

- 3 Are new rules ever imposed in your organisation due to external local pressure?

skipped

- 4 How easy is it for external parties to scrutinise the work of your organisation?

There is an executive group that represents the partnership. It meets once per month and I report to that group. I discuss what I have done and what my plans are for the future. There is also an AGM, and twice a year there is an opportunity for the business community or member so the public to attend, it is invitation only, but someone could ask and they would be allowed to attend. At the meeting I give a presentation of progress to-date. Minutes are taken, and they are kept in the council. I write a newsletter and send it out.

- 5 How would you rank the social status of your organisation in the local community?

Businesses don't quite understand it. If you went into the businesses and asked them about the Town centre Partnership, they would not know what it was. If you asked if they knew me they would say yes. There is a perception that I work for the council, and that may be one of the solutions going forward, but it is more helpful not working for the council as the business community feel I am far more accessible as one of them, rather than one of the council.

- 6 If you came up with a radical solution to dealing with a problem, how easy would it be to get your organisation to adopt your solution?

Yes

## **D Engaging with the study communities**

- 1 How significant is the presence of your organisation in the study communities?

The organisation is not well represented throughout Newton Abbot, but I am. The businesses understand that I am the town manager and what that is, but not who employs me. Even people from outside the town centre are approaching me, so they have seen the value of the role. Chudley have come to me and asked if I would talk to them about their business and the District council have asked me to get involved with Dawlish. That is because the district pays some of my salary. I have been in the media a lot - TV, radio and newspaper - so people know who I am.

- 2 Does your role engage you with members of the study communities?

Yes

- 3 Are there any restraints imposed on the frequency of face-to-face contact with the members of the study communities?

No, I work double the number of hours I am contracted to do. I do as much as I need to get the job done.

- 4 If you are not available how many alternative roles can substitute for you in your absence?

No

- 5 Are you a member of any sub-grouping related to your role?

Yes, many. Main ones – Chamber of trade, community interest company, schools, Newton Abbot networking group (big businesses), disability group, transport group, the carnival, the festival - I organise Christmas. At a recent meeting many of the sub-groups were there but most businesses were not as they were too busy running their businesses, and this is one area where I feel I have failed – in creating some sense of a business “community”. I cannot get the message through that it will benefit you if you become a part of a whole. Transition town is the group that is trying to get the community to face issues to do with long-term sustainability issues (started in Totnes and now a national movement). They are trying to engage with the community, but this is where the localism thing doesn't quite work because you do need a body of people who are paid to deliver that in order to have it there, I don't think you can rely on the community and the business community. People want a body that acts as a parent - they do not want to do it themselves.

- 6 How easy is it for you contact other organisations on issues related to your role?

Very easy.

## **E Your personal role in flood risk management**

- 1 Does your role require you to liaise with other organisations on flood risk issues?

No but the issue of snow wardens is similar. I have written to all businesses in the town, it has been on the radio and in the papers, wherever the local authority could get it and I have also given them a hard copy on information relating to snow wardens, but I have not had a single response. I have done what I can, but the way I get the best response is to eye-ball them. Last year it was a nightmare, and I say to businesses, here is a way where we can all work together to prevent it happening again, but it just needs a few volunteers – just disappointing that nobody has volunteered. Part of the problem was that I had to prepare the bid at the same time and I had to split my time and I diluted both roles, but I did my best.

- 2 Does your role give you control over any resources or information related to flood risk management in the study communities?

I don't have control over information or resources – I disseminate but I do not have control over the information. I add power to the elbow

- 3 How often are you contacted by other organisations on issues related to flood risk management?

Often. As and when – I get invited to attend. I go into their offices and ferret out the people I need. If necessary I invite myself to a meeting.

- 4 Have you encountered much opposition from the study communities when attempting to implement flood risk policies?

Not resistance, apathy.

- 5 How easy is it for you to access expert opinion on issues related to flood risk in the study communities?

Quite easy.

- 6 Have you encountered any challenges in maintaining relations with other organisations involved in local flood risk management?

Biggest challenges are with the businesses, as a manager can change quite often. You train up a manager and then he leaves, but with the other organisations it tends to be the same old faces.

**F Your organisation's role in flood risk management**

- 1 How strong are the links that bind your organisations to other organisations dealing with flood risk management in the study area?

There are some tensions, but they are good.

- 2 How long have the relations between your organisation and other organisations dealing with flood risk issues been established?

Quite well established, but that have been several organisational changes, but people have been in post for some time

- 3 How easy is it for members of the study communities to access information held by your organisation about local flood risk management arrangements?

Skipped [do not know]

- 4 Have the roles dealing with flood risk management changed in recent years?

Skipped [do not know]

- 5 How often do occupants of roles related to local flood risk management meet face-to-face with each other?

Skipped [do not know]

- 6 How often do occupants of roles related to local flood risk management meet face-to-face with the study communities?

Skipped [do not know]

## **G Dealing with organised groups in the study communities**

- 1 How easy is it to engage with the study communities?

The partnership and the chamber of commerce but they are not well supported. Businesses are not sure what the chamber delivers in terms of benefits

- 2 How much of the contact with the study communities is done through organised community groups?

skipped

- 3 Do local community groups make it easier to engage with the study communities?

It would be easier to get them all together but it would be a different type of engagement. Often a one-to-one is easier to find out where that person is coming from. In a large group you have to find a tone that is different.

- 4 Are there a sufficient number of organised groups in the study communities to make liaison with them effective?

There are too many groups and this is a problem as they all have different agendas. It would be much simpler if there were fewer groups, as it would be much simpler to understand who belongs to them, what their purpose is and how often they meet., They want clarity.

- 5 What challenges do organised community groups present to organisations responsible for managing the local flood risk?

Too many groups and some have overlapping membership – so what is the point. Then again repetition does have benefits.

- 6 What benefits do organised community groups present to organisations responsible for managing the local flood risk?

I think separate groupings are important, a separate business group and community group because they do have different interests I feel. Some are common, but generally the meetings are intended to deliver a specific message, but the challenge is often about how you get them there and when you get them there so it's about the formation of the group – when do you have the meeting, where do you have the meeting and how do you get the right timings – that is the biggest challenge that all those groups have. So what I want you to do is tell me – right you need to have this in place, you need to have it at this time and you need to communicate it using this means. Because people struggle to know should I put a notice out, how do I get it on the radio without spending any money, do I write a letter, where do I get a database from – my most successful method is going out and eye-balling. Logistics is key.

## Interview 04

### A About you

1 How long have you worked for your organisation?

Since June 2010, I had two temporary placements and now I am in a permanent position.

2 How long have you occupied your current role?

Since August 2011.

3 What duties are assigned to the role you occupy?

I work as part of a team of four - 1 manager, 2 flood risk officers (FROs), 1 technical assistant. The team was set up in response to the new Flood & Water Management Act (2009). My role is one of the FROs and I investigate flood incidents to discover who is responsible and chase them to take action, which is a requirement under section 19 of the new Act. I also take off GIS data and make sure GIS data is up-to-date. The other FRO maintains an asset register with all the flood risk structures and features (sect 21 of the Act). He also monitors the SUDS requirements under the Act.

4 How long has your role existed?

Approximately since 2009 when there were temporary placement people doing the work. I am the first person in the new permanent role.

5 Do you have access to any of the previous occupants of your current role?

No

6 How frequently are you in contact with any of the previous occupants of your current role?

N/A

## **B About the role you are undertaking**

- 1 Have there been any significant changes to the role you occupy since it was created?

We are about to take on new duties - the EA is handing over responsibility for consents related to developments affecting "ordinary" water courses – it comes into effect in April 2012.

- 2 Is there a need to change the role you occupy to make it easier for you to enact your duties?

We need to make others more aware of our role. Lots of people misunderstand what we do. We are gradually reaching out to people, but we still get queries directed to us that should not be. We are supposed to maintain a strategic view, and focus on partnership development - not be involved in individual planning applications, which should stay at the district level. I cannot see things changing, but several parts of the Act are still unclear – for example the enactment of the SUDS part keeps getting put back. Everything may change.

- 3 Does your role allow you to influence policy decisions within your organisation?

Not sure – we do not investigate large events, only small scale ones at the moment. We are assisting with the development of the Local Flood Risk Management Strategy (LFRMS) for the Council.

- 4 Do you ever feel that new rules are being imposed on your role without your full agreement or involvement?

Occasionally, I have been asked by my manager to have an input in a project where there are a few flood risk issues due to my first degree – help them by providing information and data.

- 5 Are the meanings and purpose of the rules you are required to enact clear to you?

We have to interpret the new act and a lot is not clear. The wording can be interpreted in different ways. We contribute to FLOWNET, an online forum, where organisations responsible for flood risk management can discuss issues.

- 6 How free are you to make decisions based on what you think is most appropriate to a given situation without being constrained by rules?

We are quite free and we do not have strict rules to follow. I am developing a MoU between Devon County and the EA, detailing what will happen in a flood event. I am talking to them and we make decisions between ourselves. I am also talking to neighbouring authorities to make things consistent with them, but it is nothing rigid really. Even if we say we will only investigate floods where more than 5 properties are affected, we can't be rigid like that.

## **C About your organisation**

- 1 Has your organisation undergone any significant change in recent years?

Over the last year or so they have had a major restructuring, they had several different directorates but they have narrowed it down to two – strategic directorate of people and strategic directorate of place. Highways also had a major restructuring and this department (Planning, Transportation and Environment) has had a consultation but we didn't change.

- 2 How important are external pressures on internal policy making of your organisation?

The new Act is an example of external pressures, but the Councillors are where most pressure comes from – we have to keep them happy. Cuts have also had an impact - we have had a recruitment freeze.

- 3 Are new rules ever imposed in your organisation due to external local pressure?

Not sure

- 4 How easy is it for external parties to scrutinise the work of your organisation?

People can put in a Freedom of Information (FOI) request, but we do have to make some things public. How much we make public is unclear, for example; we do a report on a flood, but we only have to publish the results, which is who is responsible and what action has been taken – possible only 1 line of text. We are trying to make as much information available as possible, so that we do not get too many FOIs and we plan to put information on a website so people can view it themselves via an interactive map. The more information on the website the better really. We are sharing not just with the public but with other authorities.

- 5 How would you rank the social status of your organisation in the local community?

I do not know, but people love to complain about the council. Newspapers are fairly negative.

- 6 If you came up with a radical solution to dealing with a problem, how easy would it be to get your organisation to adopt your solution?

Fairly easy, but it often comes down to money and funding.

## **D Engaging with the study communities**

- 1 How significant is the presence of your organisation in the study communities?

Maybe the highways dept. have neighbourhood highways officers, they are the people who would have contact with the communities more than we do and they are a useful link for us. I have listed the priority communities and I stopped counting at 150. Shaldon is quite far down the list due to the low number of properties at risk. Teignmouth is third on the list and Newton Abbot is also quite high.

- 2 Does your role engage you with members of the study communities?

I have been involved with parish councillors, but I can't do that for every incident. We did send all parish councils a survey questionnaire, but did not get a good response. We are trying to reach out to the parish level, but that is about as low as we go. The Emergency Planners are much more involved at the community level.

- 3 Are there any restraints imposed on the frequency of face-to-face contact with the members of the study communities?

We do not meet very often. We would not talk to them unless they come to us with an issue.

- 4 If you are not available how many alternative roles can substitute for you in your absence?

Any of the team can substitute to a limited extent.

- 5 Are you a member of any sub-grouping related to your role?

No I haven't been involved with other sub-groups, but placement students have been in the past - as part of their training. If I was to get involved, the highways department would be a good group, and also the people that maintain databases in the Council.

- 6 How easy is it for you to contact other organisations on issues related to your role?

Easy, we have all the contacts on a list

**E Your personal role in flood risk management**

- 1 Does your role require you to liaise with other organisations on flood risk issues?

Yes

- 2 Does your role give you control over any resources or information related to flood risk management in the study communities?

Yes, information mainly. We have produced some surface water maps on GIS, people often ask for that.

- 3 How often are you contacted by other organisations on issues related to flood risk management?

Weekly, consultants sometimes ask things. This may build over time.

- 4 Have you encountered much opposition from the study communities when attempting to implement flood risk policies?

No, people are usually encouraging.

- 5 How easy is it for you to access expert opinion on issues related to flood risk in the study communities?

We are not really the experts that people think we are. The EA is where we go, also the drainage engineers.

- 6 Have you encountered any challenges in maintaining relations with other organisations involved in local flood risk management?

Some Local Councils are well organised, they have flood risk officers who are very up on their job, but others do not- it is not very consistent across the county.

**F Your organisation's role in flood risk management**

- 1 How strong are the links that bind your organisations to other organisations dealing with flood risk management in the study area?

Fairly strong, we are in the process of setting up a “flood risk partnership” with lots of the local organisations that share responsibility for flood risk management. Our main partners are the EA and District Councils.

- 2 How long have the relations between your organisation and other organisations dealing with flood risk issues been established?

As new as the department.

- 3 How easy is it for members of the study communities to access information held by your organisation about local flood risk management arrangements?

Skipped [do not know]

- 4 Have the roles dealing with flood risk management changed in recent years?

Skipped [yes]

- 5 How often do occupants of roles related to local flood risk management meet face-to-face with each other?

Skipped [often]

- 6 How often do occupants of roles related to local flood risk management meet face-to-face with the study communities?

Skipped [not often]

**G Dealing with organised groups in the study communities**

1 How easy is it to engage with the study communities?

Some communities have groups set up specifically to deal with flood issues, but we have not had much dealing at that level, it is quite difficult to get in touch with them. Usually they get in touch with us.

2 How much of the contact with the study communities is done through organised community groups?

I have not encountered flood groups, only Parish councils. Contact comes mainly through the councillors – first at the parish level then the county councillor gets involved.

3 Do local community groups make it easier to engage with the study communities?

Easier

4 Are there a sufficient number of organised groups in the study communities to make liaison with them effective?

I have no idea really.

5 What challenges do organised community groups present to organisations responsible for managing the local flood risk?

All they want to know is who is at fault and who is going to fix things.

6 What benefits do organised community groups present to organisations responsible for managing the local flood risk?

Having a contact with someone who knows the local detail.

## Interview 05

### A About you

1 How long have you worked for your organisation?

I started in June 2007

2 How long have you occupied your current role?

Since 2007

3 What duties are assigned to the role you occupy?

I manage the team of 4, there is another section with 3 three other staff and overall we are supervised by an inspector. I also work with the operations and events teams to manage pre-planned events.

4 How long has your role existed?

I am the first occupant of the role. There has been a “uniformed” role for a long time, but this is the first time a civilian has occupied the role. It had a dual function – emergency and security, but some of the security areas have migrated to other departments. The role is always changing to get the best out of the unit.

5 Do you have access to any of the previous occupants of your current role?

There was a team of 4 officers doing the role. 3 have retired; I can speak to all of them if required. When I started I used to speak to them all. Before I came here I was an emergency planner at County Level and have done it in the oil and gas industry before that.

6 How frequently are you in contact with any of the previous occupants of your current role?

Skipped [Not often]

**B About the role you are undertaking**

- 1 Have there been any significant changes to the role you occupy since it was created?

Some responsibilities have changed “around the edges”, but the core responsibilities have not changed.

- 2 Is there a need to change the role you occupy to make it easier for you to enact your duties?

No, not really. In this force we have got it about right. We have access to the right people to make decision and to give us resource. With the financial squeezes the unit is likely to change but we will still fulfil our functions.

- 3 Does your role allow you to influence policy decisions within your organisation?

Yes within the police and within the LRF. The regional forum is still working slightly, as the Regional government was abolished, we now have REDS and we are getting good service from them. The RCCC never really worked anyway. We do not have many regional level issues, but the new system will be tested when we do have an incident when one area needs help from another in the region. We are rebuilding the regional system in a different way. Planning for the Olympics is a good example of the new system. Historically we have some strong regional working systems because of our geographic location in the South West.

- 4 Do you ever feel that new rules are being imposed on your role without your full agreement or involvement?

We are very flexible, so new things do not affect us unduly.

- 5 Are the meanings and purpose of the rules you are required to enact clear to you?

I can be when the change does not directly impact on me, the inter-linkage is not always considered and established linkages may get broken. These can be both internal and externally driven.

- 6 How free are you to make decisions based on what you think is most appropriate to a given situation without being constrained by rules?

It is harder in the planning phase than in the operational phase. Having such a diverse bunch of partners if can be difficult. Operationally we are not so constrained. We can get gold command to make a decision if we think it is needed. We have a nationally agree guide on decision making and as long as we follow the guide we can change policy if we think the situation requires it – dynamic risk assessment system

## **C About your organisation**

- 1 Has your organisation undergone any significant change in recent years?

It is undergoing quite a lot at the moment, structural changes reducing numbers both staff wise in officers. We have always been quite lean and used efficiency saving systems, but 80% of our cost is wages so efficiency can only achieve so much.

- 2 How important are external pressures on internal policy making of your organisation?

Changes are coming from inside the organisation based on changes to funding – that is external.

- 3 Are new rules ever imposed in your organisation due to external local pressure?

Skipped [yes]

- 4 How easy is it for external parties to scrutinise the work of your organisation?

Quite easy, we are quite open. We have local and regional debrief, we have the IPCC and we are scrutinised by the media. The Chief Constable does response to external scrutiny

- 5 How would you rank the social status of your organisation in the local community?

I think in Devon and Cornwall we have high status. Possibly because we are a largely rural area, it may be different in urban areas. Through various listings we are seen as a safe place to live. People understand our role – we do not have to explain that our role has changed. I can understand the problems in district, county and region as it is difficult to understand who is responsible for what, but it is much easier in a unitary authority. There is also a discrepancy across similar bodies, i.e. one council will do something but another will not do it.

- 6 If you came up with a radical solution to dealing with a problem, how easy would it be to get your organisation to adopt your solution?

Depends how radical, but we are quite a can do organisation and if you can defend your solution the organisation is quite open to accepting it. It is more difficult in planning as I have to convince other organisation to accept the proposal, but operationally it is much easier because of the dynamic risk assessment decision making system. We are trained to make decisions based on available information, but other organisations do have such a system, are reluctant to make decision or require information that does not exist. We need to train them by saying – “we need to know X, based on Y, we cannot wait for Z”. We have had plenty of practice to refine this process.

## **D Engaging with the study communities**

- 1 How significant is the presence of your organisation in the study communities?

We have our neighbourhood teams constantly in the community and they deal with day to day issues. When there are incidents we have teams dealing with prompts (999 calls). Newton Abbot is a response hub where we have an incident response team.

- 2 Does your role engage you with members of the study communities?

Yes, my team have given every parish and town council the opportunity to work with us and the environment agency and to help build community resilience. The issue there is to manage expectations. I gave a talk recently at Teignbridge district council to all the local parish and town councils about policy response to major incidents. The local authorities lead on it and we support them. One of my focus areas is community resilience. One of the key issues for community resilience is intelligence – we need to know where the vulnerable people are. We do not have a perfect image of the community but the local people do, so we need a local structure to tap into. We liaise with community leaders in any shape or form, parish councillors or others. It is easier to deal with villages than it is to deal with town and cities – where it is harder to build community resilience because there is no focus on who to go to, they are all disparate groups. It is easier in the smaller parishes because the parish council can bring everybody together. Whereas in the city where the city council is sitting over everybody but all the wards and councillors are disparate groups and it is hard to bring those areas together. The larger the community gets the less understanding of the risks there is and also because there is always a resource available to deal with incidents there is less understanding of the community resilience side.

- 3 Are there any restraints imposed on the frequency of face-to-face contact with the members of the study communities?

Obviously their time and our time. We can get access at any time through our community officers but I have constraints because it is only part of my role.

- 4 If you are not available how many alternative roles can substitute for you in your absence?

I have others who can fill in, we can always send a representative to a meeting.

- 5 Are you a member of any sub-grouping related to your role?

It depends on operations and any other incidents happening at the time. Most of the time spent doing multi-agency planning.

- 6 How easy is it for you contact other organisations on issues related to your role?

Not a problem, being part of the policy also helps.

### **Your personal role in flood risk management**

- 1 Does your role require you to liaise with other organisations on flood risk issues?

Yes, the policy have no responsibility to deal with flood risk issues directly that is the EA and local councils after the new water management act, but I wrote the emergency plan to ensure that strategic command and control is consistently maintained, with LAs responsible for annexes. We are still the lead coordinating agency when dealing with an incident. I liaise with all the other agencies. One issue is the MCA as their role has changed with the new act, we used to liaise with them over warning and informing for coast flood risk, but now that responsibility has passed to the EA and we are not sure how that system will work. In a recent incident we went straight to the RNLI, but that is not the same in every case.

- 2 Does your role give you control over any resources or information related to flood risk management in the study communities?

We have a number of tools to communicate with members of the community. When we get information, we set up a teleconference to share information with relevant parties. Our aim is to ensure everybody presents a consistent message, or at least has the same information. It is only set up if the LA or the EA request it – we then issue a public warning. We cannot force people to evacuate, we can only advise. Our main resource is to implement command and control.

- 3 How often are you contacted by other organisations on issues related to flood risk management?

Skipped [often]

- 4 Have you encountered much opposition from the study communities when attempting to implement flood risk policies?

Not lots, but we do get opposition. Mainly as a result of a misunderstanding of our role. The more rural the community the less opposition we get. The more often the community is flooded the less opposition there is. Exercising is a useful - getting several communities to get together to run a simulation is helpful tool.

- 5 How easy is it for you to access expert opinion on issues related to flood risk in the study communities?

Skipped [easy]

- 6 Have you encountered any challenges in maintaining relations with other organisations involved in local flood risk management?

No

**F Your organisation's role in flood risk management**

- 1 How strong are the links that bind your organisations to other organisations dealing with flood risk management in the study area?

Strong

- 2 How long have the relations between your organisation and other organisations dealing with flood risk issues been established?

A long time

- 3 How easy is it for members of the study communities to access information held by your organisation about local flood risk management arrangements?

Skipped [do not know]

- 4 Have the roles dealing with flood risk management changed in recent years?

Personalities have changed but roles have remained the same.

- 5 How often do occupants of roles related to local flood risk management meet face-to-face with each other?

A minimum of 2 days per month, but often more frequent. Flooding in the top 3-4 risks in our area.

- 6 How often do occupants of roles related to local flood risk management meet face-to-face with the study communities?

Skipped [not often]

## **G Dealing with organised groups in the study communities**

- 1 How easy is it to engage with the study communities?

Skipped [easy]

- 2 How much of the contact with the study communities is done through organised community groups?

Most of it – encouraging others to get together. We always go with other organisations when dealing with issues like flood risk.

- 3 Do local community groups make it easier to engage with the study communities?

During an incident we will do a “community impact assessment” at different phases of a response to help deal with the policing side of it.

- 4 Are there a sufficient number of organised groups in the study communities to make liaison with them effective?

There are in rural areas, more difficult in true urban areas. There is less interaction and no key focus that makes interaction more difficult.

- 5 What challenges do organised community groups present to organisations responsible for managing the local flood risk?

Managing their expectations and managing their responsibilities – not going beyond their capabilities. We do not give them power, but we want them to look after themselves – we want enthusiasm, but not too much. We try to protect them from themselves. If they are highly qualified, we will direct them on to others where they can help and get further approved and recognised training – like Devon & Cornwall 4x4 rescue service. Expectation management is the key.

- 6 What benefits do organised community groups present to organisations responsible for managing the local flood risk?

They provide the focus to give information and to get information. Also a chance to meet with people with some understanding rather than no understanding of what to do and how to deal with it. Also to draw a bigger group together.

